

IARO report 8.03

The role of the Airport Express

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Our mission is to spread world class best practice and good practical ideas among airport rail links world-wide.

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Executive Summary

This report looks at the role of the Airport Express – a dedicated high speed rail service between city and airport – in comparison with other access modes. It evaluates the characteristics of those places where the concept appears to be justified.

There are a dozen Airport Expresses around the world – all of them successful, and with much to commend them. The report analyses their key characteristics and the reasons for their success.

The market for the Airport Express service is largely – but certainly not solely – business. In some cases this is a particularly important market: giving the business visitor a good welcome to a city, to a country can be an important contributor to the economic success of the country, particularly one dependent on trade.

The report looks at the markets served, and also at the competitive situation, particularly from the viewpoint of the passenger. Other types of rail service exist in many places: these too can be successful, can be attractive. The report examines key differences between the five types of airport railway.

Where the Airport Express is preferred to taxi, local train, metro or bus, it seems to be preferred because of its quality and reliability. Certainly high standards are a feature of Airport Expresses – in staffing, training, on-train ambience, luggage space, customer service, information, retailing, marketing, integrated sales, punctuality, reliability, and customer quality guarantees. In short, people like the speed, the seat and the storage.

The (relatively meagre) literature on the subject is reviewed. This helps to show where public transport as an airport access mode works, and gives some indication of the relationship between quality of service and demand.

The mission of the International Air Rail Organisation (IARO) is to spread world class best practice and good practical ideas among people interested in railways to airports. This report is intended to help.

Andrew Sharp

Director General

List of abbreviations and acronyms

ADP	Aéroports de Paris (Paris airports authority)
A/S	aksjeselskap (Norwegian limited company)
CDG	Roissy - Charles de Gaulle airport in Paris
CDG Express	Planned Airport Express between Paris and CDG.
CIP	Commercially important passenger
DfT	Department for Transport (UK government)
emu	Electric Multiple Unit
e-ticketing	System whereby the passenger does not need a physical ticket. Proof of entitlement to travel is held electronically.
GDS	Global Distribution System
IARO	International Air Rail Organisation
IATA	International Air Transport Association
Integrated ticketing	Rail ticketing integrated with or sold through airline systems
JR	Japan Railways (originally one company, now split up into several parts including JR West).
KLIA Ekspres	Airport Express between Kuala Lumpur International Airport and the city.
km	kilometre
km/h	kilometres/hour
map	million annual passengers
mm	millimetres
mppa	million passengers a year. A standard measure of airport throughput, used here of terminating passengers (those starting or ending their air journey at the airport, and not connecting between flights). Equivalent to the American map (million annual passengers)
MTR	Mass Transit Rail Corporation Ltd of Hong Kong, owner of Airport Express Hong Kong
n/a	not available

pfcs	Passenger facility charges. Departure tax levied in the US.
Pitch (of seat)	distance between one seat back and the one behind it – a measure of knee-room and therefore comfort.
RER	Réseau Express Régionale – regional express railway
SAS	Scandinavian Airlines System
S-Bahn	Suburban railway (German)
SNCF	Société Nationale des Chemins de Fer Français - French National Railways
TCRP	Transit Cooperative Research Program (US)
UK	United Kingdom
VIP	Very Important Person
US or USA	United States of America

Note that UK conventions are used for

- dates (day/month/year) and
- numbers (in 9,999.99 the comma , separates thousands: the full stop . is a decimal point).

A billion is a thousand million, following US conventions.

What is an Airport Express?

From the Executive summary

This report looks at the role of the Airport Express – a dedicated high speed rail service between city and airport – in comparison with other access modes. It evaluates the characteristics of those places where the concept appears to be justified.

The Airport Express can be defined as a dedicated high speed train service operating between an airport and a city, either non-stop or with a limited number of stops. It is usually operated by dedicated rolling stock, with seating, luggage accommodation, information systems and ticketing appropriate to airport passengers.

- Seating is usually of generous pitch and width. Heathrow Express's standard seat pitch in Express Class is 910 mm - significantly better than the UK domestic airline minimum of 660 mm, ordinary transatlantic economy class standard of 790 mm, or the improved economy class standard offered by some transatlantic airlines of 865mm.
- Provision for luggage is important because in general air passengers are encumbered with significant amounts of luggage – certainly with more than the average short distance rail passenger. This does vary between the type of journey and between cultures. The Scandinavian triangle (Oslo – Stockholm – Copenhagen) is typified by out and back in a day business trips with only hand luggage. By contrast, long haul and leisure flights attract passengers making longer stays away from home and therefore needing more hold luggage. Perhaps at the extreme are the flights to West Africa, notorious for the large amounts of luggage people take – mainly goods difficult to obtain at their destination. Especially as the number of bags carried by each passenger increases, proper provision is necessary. This comprises
 - Easy access from terminal to platform (with lifts and escalators for changes in level)
 - Easy access from platform to train (typified by Heathrow Express, where the floor of the trains is at the same level as the platforms – which was easy to build in at the new Heathrow stations but expensive to retro-fit at Brunel's historic Paddington terminus)
 - Wide doorways and aisles
 - Capacious and highly visible luggage stacks. Passengers, especially those travelling in a foreign country, tend to be nervous about their luggage and therefore luggage stacks need to be visible from seats.

On Heathrow Express, the stacks have transparent sides and the overhead racks are also transparent (which has the additional advantage of reducing the risk of items being left behind – something with potentially more serious consequences for a passenger going to an airport than on an ordinary domestic journey). On Airport Express Oslo, all seats face the stacks so that passengers can easily keep an eye on their luggage.

- Information, both on and off trains, is usually of a higher standard on an Airport Express than on other trains.
 - All Airport Expresses have a dedicated web-site (even where, like Malpensa Express or Stansted Express, the Airport Express is part of a larger railway system). Four of these sell tickets: some include the possibility of a click-through from airline sites.
 - Eight of these web-sites are multilingual.
 - Internationally recognisable pictograms or multi-lingual signage is often used for both the train and the airport station.
 - On the train, even though the typical journey is short, there can be an on-train magazine (Heathrow Express, Stansted Express, Airport Express Oslo, Arlanda Express and Malpensa Express) with destination information as well as the more general articles typical of an in-flight magazine.
 - On trains, information is also often multilingual.
 - On some (Heathrow Express, Airport Express Oslo, Airport Express Hong Kong, KLIA Ekspres) there are television broadcasts often with local news and weather in one direction and onward travel information in the other.
 - On Airport Express Hong Kong there is a choice of language on the seat-back televisions. In addition, a moving light on a route diagram shows where the train is in relation to the line and key stopping points.
- Ticketing arrangements too can be of a higher standard than is typical on trains.
 - In Oslo and Stockholm, ticketing is integrated with frequent flier cards (so passengers can use an SAS Bonus Points Card as authority to travel on the trains: the airline is charged by the railway for the journeys, and can decide whether or not to charge its passengers, depending on their value to them).
 - In Oslo too, credit cards can be used for e-ticketing. Passengers swipe their card through a reader at each end of the journey: this debits their account with the correct fare.

- o In Hong Kong there is no need for special ticketing: the world-famous Octopus contactless smart card can be used on Airport Express Hong Kong as on most other forms of transport in the area.
- o Ticketing integrated with airline systems (integrated ticketing) is difficult. This is because of the assumption that, under competition law, airline Global Distribution Systems (GDSs) are unable to discriminate between carriers and therefore need to charge the same GDS charge for each sector. A transatlantic sector costing £500 can stand a £5 charge: the typical Airport Express sector costing £10 cannot.
- o Some airlines (for example Emirates and Virgin Atlantic) offered their preferred passengers free first or club class travel on Airport Expresses to and from the airport: others (British Midland, Lufthansa, Aer Lingus) effectively absorb the GDS charge in the air sector or incorporated it into the through air + rail fare.
- o Amadeus, a major GDS, accepted that they had to charge the same fee for the same service – but argued that an Airport Express journey which did not require a reservation was not the same service as a flight which did. Therefore they have worked with the Airport Express community to develop the CitySwift product and are currently developing this as a solution to the integrated ticketing problem.
- o Experiments started at the end of June 2003 with through ticketing using a GDS. In the initial phase, Heathrow Express and Arlanda Express registered the 2-digit IATA carrier code 9G for Airport Expresses generally, and tickets between airport and city can be sold in exactly the same way and on exactly the same media as an airline ticket using this code. The initial trial involved one GDS (Amadeus), one airline (Finnair) and two railways (Arlanda Express and Heathrow Express), but it can be expanded to cover as many airlines and railways as wish to participate.

The Airport Express is a dedicated service in the sense that it runs between city and airport: it is not exclusive to air passengers or indeed to passengers travelling between those points.

- When Stansted Express was introduced, it was marketed to local commuters to use as a park and ride service.
- Gatwick Express, with a reputation for reliability and levels of comfort higher than the parallel South Central services, has also attracted Surrey and Sussex commuters (despite a premium fare) who either park and ride, kiss and ride or use a local train to Gatwick to connect with Gatwick Express into London.

This aspect is covered in more detail in the section below on marketing.

Characteristics of the Airport Expresses

From the Executive summary

There are a dozen Airport Expresses around the world – all of them successful, and with much to commend them.

Twelve Airport Expresses operate, in

- the UK (Heathrow Express, Gatwick Express and Stansted Express);
- Italy (Malpensa Express and Leonardo Express);
- Scandinavia (Arlanda Express and Airport Express Oslo);
- Russia (Aeroexpress)
- Japan (East Japan Railway's Narita Express and Keisei Railways' Skyliner);

and elsewhere in

- Asia (KLIA Ekspres and Airport Express Hong Kong).

There are firm plans to build others in Paris, Wien (Vienna), Toronto and Chicago, and to significantly improve and accelerate the services to Tokyo Narita.

In a number of places, notably Brussels (Airport City Express) and Berlin (Schönefeld Express) the branding exists, but without full implementation of the concept. In Berlin, a dedicated service is planned as Schönefeld airport becomes the single Berlin airport. Osaka Kansai airport is served by both JR West's Haruka and Nankai Railways' Rapi:t services: both are express services to the airport but neither are dedicated Airport Expresses.

Key characteristics of the twelve have been tabulated on the following pages.

Heathrow Express	
Stations	<i>London Paddington (dedicated platforms), Terminals 1, 2 and 3, Terminal 4</i>
Trains	<i>Dedicated purpose built 9-car emus</i>
Luggage	<i>In-town check-in (currently, for Star Alliance only although BA's withdrawal is temporary). Commodious transparent luggage stacks and overhead racks.</i>
Journey	<i>15 minutes, with a 15 minute frequency 5:10 – 23:30.</i>
Fare	<i>Premium. First and Express class. Ticket machines, ticket offices and sale on train (with a premium). On-line sales. Some airline integration.</i>
Operator	<i>BAA plc</i>
Started	<i>1998</i>
Passengers/year	<i>4.8m</i>
On train service	<i>Train always waiting at Paddington. Television (except in quiet zone). Customer Service Representatives on each train. Complimentary Financial Times and Conde Nast Traveller in First Class.</i>
Infrastructure	<i>The 7km at the airport is dedicated: the rest is shared with other operators.</i>
Competition	<i>London Underground, bus, coach, taxi</i>

Gatwick Express	
Stations	<i>London Victoria (dedicated platforms), Gatwick (platforms not dedicated, but generally platforms 1 and 2 are used)</i>
Trains	<i>Dedicated purpose built 8-car emus</i>
Luggage	<i>In-town check-in from 1962 to 2001. Commodious luggage stacks. Baggage car</i>
Journey	<i>30 minutes, with a 15 minute frequency (reduced between midnight and 5:00)</i>
Fare	<i>Premium. Club and standard class. Ticket machines, ticket offices (at stations and in baggage reclaim) and sale on train.</i>
Operator	<i>National Express Group plc</i>
Started	<i>1935 (although with a number of changes over the years – a dedicated service operated from 1960s)</i>
Passengers/year	<i>4.2m</i>
On train service	<i>Train always waiting at both ends of the journey. Refreshment trolley. Complimentary Daily Telegraph in First Class.</i>
Infrastructure	<i>Shared with other operators.</i>
Competition	<i>Bus, coach, taxi and 2 other train operators.</i>

Stansted Express	
Stations	<i>London Liverpool Street (dedicated platform, dedicated reception lounge), Tottenham Hale, Stansted (dedicated platforms). Some trains call at other commuter stations.</i>
Trains	<i>Dedicated 4-car emus (refurbished suburban units, often operating in pairs)</i>
Luggage	<i>Commodious luggage stacks and overhead racks.</i>
Journey	<i>41 minutes, with a 15 minute frequency (30 minutes, after 16:30). Reduced service between 23:30 and 8:00.</i>
Fare	<i>Premium. First and standard class. Ticket machines, ticket offices and sale on train. On-line sales. Some airline integration (sales in flight, at check-in and using click-through from airline web-sites).</i>
Operator	<i>National Express Group plc</i>
Started	<i>1991</i>
Passengers/year	<i>3m¹</i>
On train service	<i>Train almost always waiting at both ends. Refreshment trolley (some refreshments complimentary for First Class passengers).</i>
Infrastructure	<i>Shared with other operators.</i>
Competition	<i>Coach, taxi</i>

¹ Estimate

Leonardo Express	
Stations	<i>Roma Termini, Fiumicino Airport</i>
Trains	<i>Loco and coaches</i>
Luggage	<i>In-town check-in (Alitalia and partners, hand baggage only). Dedicated luggage accommodation.</i>
Journey	<i>30 minutes, with a 30 minute frequency 7:00 – 22:00</i>
Fare	<i>First class only. Ticket machines, ticket offices.</i>
Operator	<i>Ferrovie dello Stato - Trenitalia</i>
Started	<i>1990</i>
Passengers/year	<i>n/a</i>
On train service	<i>Refreshment trolley.</i>
Infrastructure	<i>Shared with other operators.</i>
Competition	<i>Local trains (same operator, lower fare), taxi</i>

Malpensa Express	
Stations	<i>Cadorna (dedicated platform), Bovisa, Saronno, Malpensa</i>
Trains	<i>Dedicated 4-car double deck emus (variant of local suburban rolling stock)</i>
Luggage	<i>In-town check-in (Alitalia and partners, hand baggage only). Commodious luggage stacks on lower deck.</i>
Journey	<i>40 minutes, with a 30 minute frequency (not 24 hour)</i>
Fare	<i>Premium. Ticket machines, ticket offices. Some airlines offer free or discounted travel on the service.</i>
Operator	<i>Ferrovie Nord Milano Esercizio SpA</i>
Started	<i>1999</i>
Passengers/year	<i>2m²</i>
On train service	
Infrastructure	<i>The 7 km at the airport is dedicated: the rest is shared with other trains of the same operator.</i>
Competition	<i>Bus, coach, taxi</i>

² Estimate

<i>Arlanda Express</i>	
Stations	<i>Stockholm Central (dedicated platforms), Arlanda North and South (dedicated)</i>
Trains	<i>Dedicated purpose built 4-car emus</i>
Luggage	<i>Commodious luggage stacks and overhead racks.</i>
Journey	<i>20 minutes, with a 10-15 minute frequency (not 24 hour)</i>
Fare	<i>Premium. Ticket machines, ticket offices. Some airline integration with SAS Bonus Points cards.</i>
Operator	<i>Arlanda Express (until October, an Anglo-Swedish consortium: now the Macquarie Bank)</i>
Started	<i>1999</i>
Passengers/year	<i>2.4m</i>
On train service	<i>Television.</i>
Infrastructure	<i>Mostly shared with other operators.</i>
Competition	<i>State Railways (with a lower fare), bus, coach, taxi</i>

Airport Express Oslo	
Stations	<i>Gardermoen (dedicated platforms), Oslo Sentral (dedicated platforms). Alternate trains call at Lillestrom and serve National Theatre and stations in the western suburbs to Asker</i>
Trains	<i>Dedicated purpose built 3-car emus</i>
Luggage	<i>Overhead racks. All seats face commodious luggage stacks.</i>
Journey	<i>19 minutes, with a 10 minute frequency (not 24 hour)</i>
Fare	<i>Premium. Ticket machines, ticket offices. On-line sales. E-ticketing. Airline integration: travel possible on SAS Corporate Card, SAS Travel Pass Corporate and Braathens e-pass frequent flier cards.</i>
Operator	<i>Flytoget A/S</i>
Started	<i>1998</i>
Passengers/year	<i>4.1m (19.742m in the first 5 years)</i>
On train service	<i>Television (news, weather, advertisements in Norwegian and English). Customer Service staff on each train.</i>
Infrastructure	<i>Shared with other operators.</i>
Competition	<i>State Railways, bus, coach, taxi</i>

Aeroexpress	
Stations	<i>Paveletsky Station (dedicated platform, dedicated gate), Domodedovo Airport</i>
Trains	<i>Dedicated purpose built train (5 passenger coaches plus luggage car)</i>
Luggage	<i>In-town check-in with 8 desks.</i>
Journey	<i>40 minutes, with a 30 minute frequency (60 minute frequency off peak: service operates 7:00 – 22:00)</i>
Fare	<i>Premium. Ticket offices in the airport and at Paveletsky Station. Airlines with interline agreements provide a free ride and free check-in service to their passengers.</i>
Operator	<i>Moscow Railroad</i>
Started	<i>2002</i>
Passengers/year	<i>1.4m (from start-up on 3 August 2002 until August 2003)</i>
On train service	<i>Television and customer information leaflets about Domodedovo airport.</i>
Infrastructure	<i>Mostly shared with other trains of the same operator, with integrated timetable to allow fast and reliable operation.</i>
Competition	<i>Bus, taxi</i>

Narita Express	
Stations	<i>Narita airport (2 dedicated stations), Tokyo Central. Some trains continue beyond Tokyo.</i>
Trains	<i>Dedicated purpose built 9-car emus</i>
Luggage	
Journey	<i>53 minutes, hourly or half-hourly depending on the time of day (not 24 hour)</i>
Fare	<i>Premium. Green (open and compartment, at different prices) and standard class. Ticket offices.</i>
Operator	<i>East Japan Railway</i>
Started	<i>1991</i>
Passengers/year	<i>n/a</i>
On train service	<i>Reservation necessary.</i>
Infrastructure	<i>Shared with other operators.</i>
Competition	<i>Other rail services (by Keisei Dentetsu and JR East), taxi</i>

Keisei Skyliner	
Stations	<i>Narita airport (2 dedicated stations), Tokyo Ueno</i>
Trains	<i>Dedicated purpose built 8-car emus</i>
Luggage	
Journey	<i>61 minutes, every 30-40 minutes (not 24 hour)</i>
Fare	<i>Premium. Standard class. Ticket offices</i>
Operator	<i>Keisei Dentetsu</i>
Started	<i>1991</i>
Passengers/year	<i>n/a</i>
On train service	<i>Reservations necessary</i>
Infrastructure	<i>Shared with other operators.</i>
Competition	<i>Other rail services (by Keisei Dentetsu and JR East), taxi</i>

<i>KLIA Ekspres</i>	
Stations	<i>Kuala Lumpur Sentral, Kuala Lumpur international airport (both dedicated)</i>
Trains	<i>Dedicated purpose built 4-car emus</i>
Luggage	<i>In-town check-in (and provision for in-town check-out in future), currently used by Malaysian Airlines, Cathay Pacific, Royal Brunei and Air Asia. Commodious luggage stacks and overhead racks.</i>
Journey	<i>30 minutes, with a 15 minute frequency (24 hour service)</i>
Fare	<i>Premium. Ticket machines (some in reclaim), ticket offices.</i>
Operator	<i>KLIA Ekspres</i>
Started	<i>2002</i>
Passengers/year	<i>2m (forecast full year figure)</i>
On train service	<i>Television.</i>
Infrastructure	<i>Mostly shared with the same operator's commuter service.</i>
Competition	<i>Coach, taxi, commuter service</i>

<i>Airport Express Hong Kong</i>	
Stations	<i>Hong Kong, Kowloon, Chek Lap Kok airport (all dedicated)</i>
Trains	<i>Dedicated purpose built 7-car emus</i>
Luggage	<i>In-town check-in at 2 stations for most airlines. Commodious luggage stacks and overhead racks.</i>
Journey	<i>23 minutes, with a 15 minute frequency (not 24 hour)</i>
Fare	<i>Premium. Ticket machines, ticket offices.</i>
Operator	<i>MTR Corporation Ltd.</i>
Started	<i>1998</i>
Passengers/year	<i>8.5m</i>
On train service	<i>Multi-channel bi-lingual television. Customer Ambassadors on each train.</i>
Infrastructure	<i>Mostly shared with other trains of the same operator.</i>
Competition	<i>Express bus, coach, taxi, suburban service (with shuttle bus to airport station)</i>

Hence it can be concluded that

- Most have dedicated platforms
- Most use purpose built trains
- Most have dedicated luggage provision: a few have in-town check-in
- Most have a clock-face frequency and a fast service
- Most have a premium fare
- Most are walk-on: only on the two Japanese links are reservations required
- A high standard of on-train amenity is provided
- There is a range of operators – from the independent operator through the national railway company to the airport operator
- The concept is largely new – a product of the 1990s

Only in Hong Kong and Oslo is there more than one downtown station. By definition, a downtown station can only be in one place and serve one area of the city: they may not be in the best place in the conurbation – at least initially.

Airports tend to be natural points for commercial development – hotel and office development in particular. The Airport Express terminals are to a degree becoming the airport in the city, and stimulating the same kind of development as do the airports themselves. This is for exactly the same reason as development occurs round airports – connectivity, accessibility.

Heathrow Express's terminal at Paddington, for example, was criticised because it was in neither the West End nor the business district of the City of London. But the centre of London has moved towards Paddington: the massive Paddington Central development has brought large numbers of apartments, shops and the headquarters of firms like Marks and Spencer, Kingfisher and Visa to Paddington. Part of the attraction is connectivity – the fact that it is 15 minutes from Heathrow.

The Paddington Hilton Hotel advertises itself as being the closest hotel to Heathrow: there are hotels around the airport itself which are closer in distance but not in time! Moreover the journey is not as easy. Wheeled cases can be checked in at Paddington or transferred from the Paddington Hilton to the airport step-free: there are lifts and escalators where necessary, and the train floors are on level with the platform with the smallest gap technically possible. The Heathrow Hotel Hoppa buses are low-floor, but there is a gap between floor and curb: the same is true of taxis.

The same phenomenon occurred at Stockholm Central – it became a major location for IT offices, because it was simultaneously in the city and 20 minutes from the airport.

Kowloon, on Airport Express Hong Kong, is becoming a major centre because of the development over the station – there are plans for 13,000 apartments, 4 hotels and 2 shopping malls. This is partly a function of the accessibility of Kowloon generally, but the Airport Express station is certainly a key feature of that accessibility.

At Hong Kong and Kowloon stations, there already has been property development amounting to 1.5 million square metres of floorspace (about a third office space, over a third domestic and the rest hotels and shops)³.

Many Airport Express terminals are central (Malpensa Express's Cadorna, Hong Kong's Central) and all are directly connected to the local public transport system (including local and sometimes national or regional trains). Some make specific provision for good integration with the local transport.

- In Oslo, dedicated hotel shuttles were abandoned because few used them: however, dedicated shuttles to the headquarters offices of some major companies do still run.
- Heathrow Express too withdrew its hotel shuttle bus service, but organises a taxi share system (for use by all passengers at Paddington) in the morning peak. A few company-specific van shuttles have been organised by specific companies.
- Hong Kong has a comprehensive network of hotel shuttles, and an excellent taxi interchange at its downtown stations.
- When Malpensa Express's downtown terminal was comprehensively refurbished in preparation for the launch of the service, special attention was paid to connections to the local underground rail system, the Metro.
- Paveletsky Station is one of the biggest in Moscow, with interchange to the Metro. There is a ramp from the City Air Terminal to the platforms, with baggage carts available.

Other stops are chosen because of their traffic generation potential.

- Kowloon serves the main business district outside Hong Kong Island.
- Tottenham Hale, on Stansted Express, gives connections with the London Underground Victoria Line to King's Cross and the West End.
- Airport Express Oslo runs through the city to the western suburbs where the former Fornebu airport was located: it is a popular residential area for employees and air passengers. National Theatre station, serving the west of the city centre, also improves accessibility.

³ "Hong Kong's future is guided by transit infrastructure", by Corinne Tiry of Lille Ecole d'Architecture, in Japan Railway and Transport Review 35, July 2003.

- About half of the Narita Express trains start from Shinjuku or Yokohama, in the Tokyo conurbation.

The airport station is usually integrated into the airport.

- The stations on Heathrow Express are linked to the terminals by escalators, lifts and the inter-terminal moving walkway system.
- Gatwick Express's station is underneath South Terminal.
- Malpensa Express and Leonardo Express are integrated with their airports by connecting walkways.
- Arlanda Express has two stations serving its complex of four terminals: they are comprehensively connected by lifts and escalators.
- In Oslo and Kuala Lumpur, there are escalators and lifts to the terminal, almost directly above the stations.
- At Moscow Domodedovo, the station is in the airport terminal.
- Hong Kong shows excellence in planning. Trains from the city arrive at departures level: passengers alight and can go to their gate without change of level. Trains continue to a turnback siding where they reverse and run into a platform at arrivals level, so that arriving passengers too do not need to change level to get to the trains to the city.

Although none of the services has exclusive use of its own infrastructure between city and airport, they all manage high average speeds.

The fastest is Airport Express Oslo: this runs at an average speed of 152 km/h. The Storting (Norwegian Parliament) insisted, in the railway's founding Act of Parliament, that trains to the new airport at Gardermoen should reach it in 19 minutes, the same time as people could reach the old downtown airport at Fornebu.

Three others average over 100 km/h start to stop: three more average over 80 and the rest between 66 and 74 km/h.

Most have a premium fare: this aspect is explored in more detail in the Fares section of "Why is the Airport Express preferred?" below. The key points, though, are that the premium fare is often irrelevant to the customer's choice, and it means that the service can be profitable despite high costs.

- Gatwick Express, for example, carries four times as many passengers between Gatwick and London Victoria as its cheaper competitors, even though the competing service has the same frequency, and just one more stop and a 3 minute longer journey time.

- Heathrow Express carries about the same number of people to Heathrow at a standard fare of £13 as does the London Underground at £3.60. The London Underground passengers tend to be airport employees or originate from the office district around Hammersmith or the hotel districts of South Kensington and Russell Square, which it serves well.
- Hong Kong's Lantau Line carries trivial numbers of air passengers at HK\$23: most go on Airport Express Hong Kong at HK\$100.

In-town check-in is a feature of some Airport Expresses – although it can be difficult to devise an acceptable financial model. Where provided, it is popular: 10% of Concorde passengers used Heathrow Express's Paddington check-in.

It has many advantages.

- People usually have to check out of their hotels during the morning: if they are catching an evening flight, the opportunity to check-in bags downtown and have the rest of the day unencumbered is valuable.
- It tends to be highly reliable: Airport Express Hong Kong mishandles 0.006% of checked bags compared with the airline industry average of 0.15%; and Heathrow Express has damaged one bag since the service opened in June 1999.
- If baggage handling problems are solved, people are more likely to use rail to access the airport. Indeed, the amount of baggage is understood to be one of the key deciding features in modal choice.
- Airports have longer to scrutinise bags and to deal with any problems.
- Space tends to be more at a premium at airports, especially since 9/11.
- Financial pressures are leading many airports to maximise commercial opportunities and reduce the area devoted to check-in as far as possible: this is leading to the use of self service machines and (where this is financially sensible) off-airport check-in.
- In its first year, Aeoroexpress checked in 180,000 passengers at the downtown terminal (over 25% of its outbound passengers).

These systems are usually security validated both by the national security organisation and by the US Federal Aviation Administration⁴.

⁴ Understandably, as security was enhanced after 9/11, American airlines and airlines serving America found it more difficult to offer the service.

The market for airport surface access

From the Executive summary

The market for the Airport Express service is largely – but certainly not solely – business. In some cases this is a particularly important market: giving the business visitor a good welcome to a city, to a country can be an important contributor to the economic success of the country, particularly one dependent on trade.

The report looks at the markets served, and also at the competitive situation, particularly from the viewpoint of the passenger.

Demand and quality

Airport Expresses like those in Oslo, Stockholm, Hong Kong and Kuala Lumpur can attract up to 35% of air passengers. However at Heathrow, because of heavy competition from other modes and the proximity to the city, the market share is only 15%. Passengers really appreciate services like these – high quality, reliable, comfortable. On Heathrow Express, between 97% and 98% of passengers say they will use the service again. 97% of Airport Express Oslo's passengers are very satisfied or completely satisfied. 99.5% of Airport Express Hong Kong passenger journeys are completed on time.

Many Airport Expresses give quality-of-service commitments.

- If Heathrow Express delays your journey by more than 15 minutes, the ride is free.
- Stockholm's Arlanda Express should take 20 minutes from airport to city: if it takes longer, the ride is free.
- If you miss your flight and it is the fault of Airport Express Oslo, they will re-book you – an easy promise to the business traveller on a full fare ticket, but the same promise holds true if you have a non-refundable non transferable bargain price ticket.

Most Airport Expresses research their passengers and survey their opinions for a variety of reasons – not least to explore market segmentation. The most usual segmentation is business and non-business. The latter is not necessarily leisure: visiting friends and relations is certainly leisure, but personal business and education are not.

Within this split by purpose, there is usually also a split between residents and non-residents of the country in which the service operates. However Arlanda Express in particular subdivides residents into those living in the Stockholm area and those living in Sweden but outside Stockholm, because the characteristics are different. People living in Stockholm are likely to have a car available and to know the local transport system: the converse will be true of foreigners and Swedes not living in the capital. However the latter will be more confident about using the local public transport system than those not resident in Sweden.

The business community

Business users are usually the predominant share – although this varies from place to place and from season to season.

There are several reasons why the business community is the major user.

- Business and independent leisure passengers tend to be money rich but time poor, with a high value of time and reliability.
- The company, not the individual, tends to pay the fare and the demand for premium fare travel is therefore more inelastic.
- Passengers have just paid significant amounts for an air fare and are therefore more tolerant of a premium rail fare.

Some companies suggest or enforce a travel policy: in some cases this includes use of the Airport Express. When Airport Express Oslo started, for example, the marketing team visited major Norwegian companies to suggest putting use of the train in their company travel policies. Many do. In some cases employees must use the train. In others they should do and if they do not, they can only reclaim travel expenses up to the level of the rail fare. The same situation is developing informally with some London-based companies.

- This is partly because of the speed and reliability. Heathrow Express gets you from London to Heathrow Central station in 15 minutes on 85% of occasions⁵: a taxi may take 40 minutes or 140 minutes, depending on the traffic.
- In addition, when on an Airport Express, one can work, think, relax, or use a lap-top or a mobile phone: one can do none of these safely at the wheel of a car.

Airport Express can be the mode of choice for VIPs or CIPs. Indeed, Heathrow Express's internal staff newsletter, the "Weekly Brief", regularly lists celebrities seen on board (and these range from members of the royal family and politicians to people in the news, stars of stage and screen and sporting personalities).

⁵ This is the current moving annual average.

Heathrow Express provides two classes of accommodation; and, prior to introducing first class, researched the demand. A measurable sector of the market would only use Heathrow Express if first class was provided. It was surmised that these were people who had unrestricted choice of mode, and could use a limousine or company car instead if they chose.

Airport Express can be used by visiting dignitaries on official visits. Arlanda Express was used by President Chirac of France during the Swedish presidency of the European Union, for example.

Competition and usage of other modes

Competition exists on all Airport Express services: on-rail competition on a few. This can be direct competition between the same two points (Gatwick Express) or needing a more intricate journey (Airport Express Hong Kong compared with the Lantau Line and a short shuttle bus ride).

Very few of Heathrow Express's passengers are airport staff: it does not serve employee residential areas. Employees are a strong market for the local buses and for trains like those on the Piccadilly Line of the London Underground – which is why the London Underground still carries many people to Heathrow, despite the lower quality of service. It has not had a major loss of traffic because of Heathrow Express – but it has had a major loss of complaints, because those who used to complain about it now travel on Heathrow Express. Employees, of course, benefit from the London travelcard scheme offering discounted travel for regular passengers (although BAA's airports also have an Airports Travelcard giving airport-based staff discounts for travel to work).

Other passengers find the catchment area of the London Underground more convenient – especially for the offices in the Hammersmith area of west London and the hotel areas of Kensington and Russell Square.

The bus is a valuable public transport mode, but it can rarely compete successfully with high quality rail. Heathrow Express was a factor in the reduction of the Airbus network between London and Heathrow, although express coaches still successfully serve Stansted and Gatwick. The Flygbuss service to Stockholm Arlanda is suffering because of the introduction of Arlanda Express, even though it serves different areas of the city on its way to the centre, and is well integrated (by common ownership) into the city taxi network. Arlanda Express carries over a third of all passengers travelling to and from the airport.

Car is clearly the main competitor for airport access. Heathrow Express claims to remove 3000 car trips from the roads each day, although since the service carries nearly 5 million people a year, the actual figure is probably higher. Each of these car trips will be for the 20 km from central London, with significant impacts on pollution, noise and congestion in the M4 corridor and on local roads.

Involvement of the air transport industry

Airport access solutions were historically left to the national or local transport authorities to implement. Airports may have been required to supply space and connections to terminals, but there was only a limited contribution to planning, funding, construction and operation. Dedicated airport express operations have changed this. They have involved the air transport industry, principally airports but also airlines, in many aspects and have thus brought in additional capabilities.

BAA's funding of Heathrow Express brought over £500 million capital spend when the UK Government was unable to sanction spending by the then British Railways Board. The development of Stansted Airport's rail access arrangements is tied to the growth of the airport by a planning agreement as, to a lesser degree, is Heathrow's Terminal 5.

A full understanding of the needs of air passengers (for example in terms of market segmentation, customer service or security requirements) is only possible from within the air transport industry. A service not planned and operated with this knowledge will find it more difficult to attract air passengers and airport employees.

BA recently moved their Moscow services from Sheremetyevo airport to Domodedovo airport in part because of the Airport Express and the in-town check-in. Major investment by the airport operator, the East Line Group, in other facilities at the airport was also a factor.

The attitude of airports and airlines is important. Airports will not invest in facilities which are not predominantly for their customers, and in particular for air passengers. Airlines, the airports' main customers, will object to an airport's financial involvement in general transport infrastructure: they clearly see this as the responsibility of the local or national transport authorities. A significant legal objection by airlines to the use of passenger facility charges (pfc's – the US air passenger departure tax) at New York's JFK and Newark airports for their Airtrain systems was overcome only because the airport operator was able to demonstrate that they would be used by air passengers and airport employees.

UK Government policy is that the air transport industry should contribute to the cost of access arrangements to the extent that it benefits⁶. This is a key phrase, and it is clear that the financially stretched air transport industry will watch very carefully to ensure that it only contributes this, and no more. If airport-funded infrastructure is used for non-airport services, or services not predominantly used by air-related passengers, the funder will of course expect to charge an appropriate access fee reasonably reflecting the cost of provision of the infrastructure.

⁶ See for example "The Future Development of Air Transport in the United Kingdom: South East", second edition, section 17.4, for an enunciation of the principle.

It is clear that airlines and airports will agree to contribute to access systems which are dedicated to air passengers and airport employees, or are at least primarily designed for these markets. It is also clear that the air transport industry will contribute significantly less to solutions whose primary objective is something other than serving the airport.

The future

Heathrow Express is a key element in BAA's stated objective of getting 50% of airport access movements onto public transport.

This is a key issue for the future: air transport generally is forecast to double by 2015⁷ and congestion would be significantly worsened if all of the additional traffic used road. With the advent of the 550 seat Airbus A380, rail is the only mode likely to be able to cope with peak volumes. The rail product needs to be highly attractive in order to maximise use.

⁷ The forecasts for the UK are slightly lower: the growth between 2000 and 2015 is forecast to be 85%, from 181 mppa to 335 mppa (source: DfT's Air Traffic Forecasts for the United Kingdom 2000, mid-point forecasts).

Typology of airport rail surface access modes

From the Executive summary

The report looks at the markets served, and also at the competitive situation particularly from the viewpoint of the passenger. Other types of rail service exist in many places: these too can be successful, can be attractive. The report examines key differences between the five types of airport railway.

As well as the Airport Express, four reasonably distinct types of rail service to airports can be identified - although there are no agreed definitions and no clear boundaries between them. These are described below.

- High speed network. Good examples can be seen at Paris Charles de Gaulle and Frankfurt. The airports have a station on the national and international high speed rail network – a factor which can increase the catchment area and the capacity of the airport (in particular by code-sharing with the railway companies, reducing the need for short haul flights). Paris – Brussels and Newark – Philadelphia are two examples where airlines (Air France and Continental Airlines) withdrew all flights because of the opportunities offered by code-sharing⁸.
- Regional network. Southampton, Birmingham, Manchester in the UK and Genève and Zürich in Switzerland are excellent examples of an airport station on a regional rail network. Here too there is significant potential for extending the catchment area.

It is interesting that regional rail to Manchester airport (not served by an Airport Express) has a higher market share from medium distances like Leeds and York (85 and 126 kilometres from the airport respectively) than from Manchester itself.

In Leipzig-Halle, the regional rail network is being used as a weapon to win traffic from the Berlin airports system – with, in particular, off-airport check-in being used to facilitate (and therefore encourage) journeys by leisure passengers from places like Magdeburg, Dresden, Erfurt, Chemnitz and even Berlin itself.

- Suburban. A suburban rail service to an airport is the most common form of airport rail link. It is typified by Luton and Prestwick airports in the UK, Trondheim in Norway, Barcelona in Spain and Newark in the USA⁹.

⁸ Recently Expressjet Airlines, Continental Airlines' code-share partner, has taken the commercial decision to reinstate one round trip on the Newark - Philadelphia route.

⁹ Which also has a long-distance service.

Trains are essentially designed for commuters – the core business – with high density seating, limited baggage space, information and ticketing appropriate to the commuter market, doors designed for quick loading and unloading (and therefore often six doors in each car rather than four – which in itself reduces the space for seating and luggage).

An interesting case study comes from Sydney. Here, the new line serving the airport is really designed for commuter traffic. Specifically it is intended to by-pass and relieve an existing bottleneck where a number of commuter routes converge. Essentially for political reasons (the airport is unpopular locally, so for example the airport line is not branded as such but called the New Southern Railway) no dedicated trains or rolling stock have been provided.

As a result, international passengers arriving off early morning flights are faced with very full double-deck commuter trains with no provision for luggage.

In addition, the operating environment is very complex (with different companies owning the track, operating the trains and operating the stations) and the marketing is poor. This led to the station operator going into bankruptcy.

- Metro/light rail. The boundary between suburban and metro on one hand and metro and light rail on the other is particularly opaque, so metro/light rail is the final type identified. Examples can be seen in Bremen, in Portland (Oregon), in Madrid, in Newcastle.

It is particularly good for transport of employees – the ticketing system and the in-town distribution are particularly geared to this.

Luggage accommodation is usually a particular problem, although the excellent example of Madrid's new line 8 between Nuevos Ministerios and Barajas airport needs to be highlighted here. Trains have large luggage stacks (which inevitably reduces seating accommodation – acceptable on a 12 minute journey). Also there is in-town check-in at the downtown station, located at a new office district for the city.

Another metro where trains have luggage stacks is Singapore, but trains inter-work with those on other routes so suitable trains do not always run on the airport line.

Charles de Gaulle – a case study

Paris Charles de Gaulle (CDG) can be used as a case study of the issues arising at a major airport.

The capacity of an airport depends on the capacity of a number of aspects – the runways, the terminals and the ground transportation system in particular. If any of these are inadequate, the airport suffers – in punctuality and reliability, in reputation, in customer attractiveness.

- Wong Woon Liong, Director General of Aviation, Singapore is quoted as having said¹⁰, “I would even say that our attention may have to go beyond airports and airways. For example, landside access to and from the airports is just as important to air travel. Sometimes you wonder where the responsibility of an airport operator should end, because passengers do sometimes complain about an airport not being easily accessible. In most cases, access to the city is beyond the control of the airport operator. Yet it has a considerable impact on how well an airport serves its passengers.”
- Atlanta, sometimes the largest airport in the world in terms of passenger numbers, recently sought IARO’s advice on getting more people on to public transport. The airport – which has the second largest car park in the United States – suffers because some of the remote parking is so remote and some access roads are so congested that passengers miss flights. This is no way to preserve the future of an airport as a major international hub.

The same is true of Charles de Gaulle – it needs high quality diverse and attractive means of access to stay world class, to stay competitive with airports like Heathrow, Frankfurt and Amsterdam Schiphol.

CDG is fortunate in having the TGV – and the inspired marketing which led to the creation of the TGV’Air initiative, whereby a number of major airlines code-share with SNCF on domestic services in France. This serves a particular market – that for long distance surface access from the French regions and from Brussels.

It is fortunate in having the RER. This too serves a particular market – employees, people travelling from Orly and from origins on other Metro and RER lines and able to change to the RER in central Paris.

There is a market unsatisfied by this, which is the justification for the CDG Express.

The market sectors to which this will appeal are the business traveller in a hurry, and the independent leisure passenger. Both are keen users of Airport Expresses. On Heathrow Express, over 60% and on Airport Express Oslo, 70% of passengers are travelling on business. On some Airport Express Oslo trains, over 95% of passengers are.

¹⁰ in Airport World April/May 2001

The main reasons are speed, reliability and quality.

On Heathrow Express, many passengers time their journey to the minute – catching the train which will just allow them to get to the airport in time for their flight. People do not want to wait longer than necessary even in the most beautiful of airports; and time is a valuable commodity. CDG Express will add to peoples' usable time. The journey, short though it is, will be productive: passengers can read, think, doze, work, use a lap-top or a mobile phone: they can do none of these at the wheel of a car. They are constrained in some of them on other means of transport to the airport too: on CDG Express, it will be a natural experience. The time saved will make the business community using Charles de Gaulle more efficient, more productive.

The range of size of airports with Airport Expresses is interesting. Heathrow (60 million passengers a year - mppa) obviously justifies the express link, as do places like Hong Kong and Gatwick (33 mppa) and Narita and Rome Fiumicino (27 mppa). But Milan Malpensa (21 mppa), Stockholm Arlanda (18 mppa) and places like Oslo and Stansted (12 – 14 mppa) also have one: Vienna (12 mppa) is building one, with in-town check-in, paralleling the existing S-Bahn.

CDG Express will be built for air passengers and these no doubt will be the majority of users. However there is no reason why it should be dedicated to air passengers. The airport is a business centre, a commercial centre, for meetings and conferences: those in central Paris attending such events will also want the convenience and time saving of CDG Express. 85% of Heathrow Express's traffic, is formed of air passengers: 15% are not. But the station at Heathrow is less convenient to the business activities at the airport than will be that of CDG Express.

Service frequency on Heathrow Express is every 15 minutes: a frequency of 10 – 15 minutes is typical for such services world-wide. A journey time of around 20 minutes, as is proposed for CDG Express, is also attractive to the market.

At CDG, research showed that the regional metro, the RER, had a relatively low market share. Therefore both short term and long-term initiatives were devised to meet this, and to reduce the local road congestion problem. As a long-term initiative, CDG Express was planned as a world-class Airport Express, with new infrastructure, new trains, in-town check-in at the downtown terminal at Gare de l'Est and innovative solutions to the problem of limited space for baggage handling at the airport station.

Roissy Charles de Gaulle already has the RER service, a very valuable link between Charles de Gaulle and Orly, and between Charles de Gaulle and the other Metro and RER services accessible through its central Paris interchange stations.

However, it is a general purpose regional express service aimed more at commuters, and not adapted to the needs of air passengers. The two markets are very different. Typically, commuters travel every day, knowing the route and carrying just a briefcase: air passengers travel infrequently, not knowing the route and much encumbered with baggage.

Air passengers form a specialised market with special demands – in particular as regards baggage. Air passengers, especially on certain routes and in certain cultures, tend to have quantities of baggage with them. There is very limited provision for this on the RER, and this leads to problems. Passengers need to use steps up into trains; and find no-where to put their bags when they get there.

By contrast, Airport Expresses tend to have coaches with the floor on a level with the platform, making it easy for people with wheeled cases, pushchairs and golf carts, as well as the disabled. They also have suitable luggage accommodation.

Air passengers from abroad in particular tend to be very protective of their baggage, and have a mistrust of the local population: a multi-stop service in particular can arouse feelings of concern and insecurity. When the only place for bags is in vestibules, on the floor or on seats, these feelings are exacerbated.

As a short term initiative, steps have been taken in recent years to combat some of these problems. There are now frequent non-stop trains between the airport and Gare du Nord, and joint ADP/SNCF information points have been provided on the platforms there. However, the fundamental problems are difficult to cure on a regional and commuter railway.

The CDG Express project is currently going through the national planning process.

As planned, it will run non-stop between dedicated platforms at a new terminal created at Gare de l'Est, and dedicated platforms at the airport.

Gare de l'Est is being extensively modernised and will be served by a new RER and Metro station between the two major stations of Gare de l'Est (serving the east of France – notably Metz, Nancy and Strasbourg) and Gare du Nord (serving the north, Brussels, north west Germany and the UK). It will have in-town check-in.

The airport station is being modified to accommodate checked baggage – difficult in the constrained space, but seen as essential for a major long haul airport. It will have quick and easy connections by a new people mover, currently under test, between the station (under terminal 2) and terminals 1 and 9.

The route will use a few kilometres of existing track at each end, with a new tunnel being constructed to connect Gare de l'Est with the Grand Ceinture orbital line on which CDG station is built.

The project is seen as essential in maintaining CDG's status as a competitive world-class hub.

Why is the Airport Express preferred?

From the Executive summary

Where the Airport Express is preferred to taxi, local train, metro or bus, it seems to be preferred because of its quality and reliability. Certainly high standards are a feature of Airport Expresses – in staffing, training, on-train ambience, luggage space, customer service, information, retailing, marketing, integrated sales, punctuality, reliability, and customer quality guarantees. In short, people like the speed, the seat and the storage.

At most airports with Airport Expresses, there is competition for traffic between the airport and the city. Mode share figures are limited, but those publicly available include Heathrow Express and Gatwick Express.

Gatwick Express takes 30 minutes to run non-stop between Gatwick and London Victoria. South Central, with slightly lower quality rolling stock, one intermediate stop and a 3 minute longer journey time takes only 20% of air passengers¹¹. Indeed, the quality of Gatwick Express is such that significant numbers of commuters from Sussex and Surrey are prepared to pay a premium fare to use it.

Heathrow Express has much the same market share of traffic between London and Heathrow as London Underground does: the latter serves the hotel districts of Kensington and Russell Square as well as the office district of Hammersmith. It also serves the residential areas of Hillingdon and Hounslow where many airport employees live.

After the events of 9/11, Heathrow Express demand dropped less than that at Heathrow generally – so it was gaining market share even at such a bad time for the world economy. National Express Group's latest interim report (for the first half of 2003) shows that Stansted Express's traffic increased in the half year by over 14%.

Research in Lyon showed that airport access mode choice depended strongly on access time (59%), and to a lesser degree on comfort (13%) and cost (12%).

Over 70% of Arlanda Express users interviewed in a recent survey were either absolutely sure or quite sure they would use Arlanda Express for their next trip to the airport. A telephone survey in Stockholm showed that 76% of people were unlikely to change their airport access mode – but 17% were likely to change to Arlanda Express.

Customer service

Airport Expresses make a point of providing high quality customer service. This is not unique to Airport Expresses, but is certainly a feature of them.

¹¹ The real figure is almost certainly lower - 20% is the share of both South Central and Thameslink, which operates to other London termini.

On Heathrow Express, all staff are recruited on the basis of their customer focus, their customer service skills. They were all recruited new, from a wide variety of sources, and Heathrow Express was therefore able to recruit only those who demonstrated that they had the right skill base. They are all recruited as Customer Service Representatives: if they wish to learn to drive a train, they can do, but even drivers rotate duties so that they have a mix of driving, selling tickets at ticket offices and interfacing with customers on trains¹².

For a variety of reasons not all Airport Expresses have been able to do this, but certainly where it has been possible, it has been done.

The launch of Arlanda Express was delayed in the autumn of 1999: all of the staff were fully trained but could not work because the trains were not ready. Arlanda Express management were very reluctant to lend them to the State Railways in case they learned bad habits and forgot their customer focus – so instead they loaned them to Heathrow Express, who were temporarily short of on-train staff.

Staff usually receive special customer service training, and are equipped to handle international passengers (for example, with language skills). They are often given airport information and airport familiarisation training, so that they are equipped and able to assist passengers with flight connections.

On the train

The on-train ambience is uniformly of a high standard.

Good – and sometimes dramatic – external design is often a feature of trains (even those like Airport Express Hong Kong, the exterior of which passengers never see because of the platform screen doors). The new Gatwick Express trains are a particular example, as are the series 50,000 emus bought by the Nankai Railway to operate its Rapide express passenger services between Nannba and Osaka Kansai airport. These highly distinctive trains, constructed with a warrior's helmet-shaped driving cab and portal-style car windows, have been developed by Dentsu, a Japanese design company.

Airport Express Hong Kong, Airport Express Oslo, Arlanda Express and Heathrow Express also have a very distinctive external appearance. This reinforces the impression that the service is special.

The internal design is of course much more important, and here can be found many examples of features of value to passengers. These include

- luggage stacks (often with transparent sides),
- floors on level with the platforms (in some cases, for example Arlanda Express at Stockholm and Heathrow Express in London, necessitating expensive capital work),

¹² A policy which had one unintended effect – over half of Heathrow Express drivers are female.

- high quality seating with a good seat width and pitch,
- on-train video, with news, weather and entertainment,
- facilities for the disabled,
- toilets (even for the short journeys typical of Airport Expresses).

Significant effort is also put into the internal design itself.

- The popular image of Sweden was thought to be of a cold country, so Arlanda Express features bright reds and yellows in the carpet, fabric and wall colours to dispel this. The fabrics also show leaves, to emphasise the environmental credentials of the service. A survey before the service opened showed that the main reason for significant numbers of potential passengers choosing Arlanda Express was its environmental friendliness.
- Airport Express Oslo has pale Scandinavian wood for its seat backs, giving a very clean appearance.
- Heathrow Express has subdued blues, purples and violets in its colour scheme – colours chosen for their low stress levels.

Customer service has already been touched on under staffing and training. Airport Expresses usually have generous staffing levels to ensure the high level of customer service. There are usually on-train staff, and all staff are geared to the needs of international passengers (some of whom are culturally unfamiliar with trains: others will be jet-lagged, stressed and will have experienced major changes in things like heat and humidity).

Information

Information is another aspect of customer service, and receives much attention. There is a range of needs - at the journey planning stage, at the Airport Express city terminal, on the train, at the departure airport, in flight, at the destination airport, on the train to the city, and at the destination downtown station.

- For advance journey planning, all Airport Expresses have web-sites. Eight of the twelve are multi-lingual¹³, and four provide for on-line ticket purchase¹⁴. Details of the train service are usually in national rail timetables too.

¹³ Hong Kong, Milano, Moscow, Oslo, Roma, Stockholm, Tokyo Narita and Tokyo Keisei

¹⁴ Heathrow, Gatwick, Stansted and Rome

- At the city terminal, most Airport Expresses have dedicated platforms and international signage (multi-lingual, or with internationally recognisable pictograms). At Moscow Paveletsky Station, screens show on line check-in information. At the station, particularly on the departure platform, the information is usually in the form of a count-down indicator (minutes to the departure of the next train – and often the one after too). Airline offices are sometimes provided – for check-in (Roma Termini, Milano Cadorna, Hong Kong, Kowloon) or for sales as well (Lufthansa and Star Alliance at Paddington, Malaysian Airlines at Kuala Lumpur Sentral).
- On the train, there are sometimes televisions with information: sometimes (Hong Kong, Kuala Lumpur, Oslo) these are multilingual too. There are usually announcements, also often multi-lingual (on Stansted Express, for example, in five languages). Airport Express Hong Kong is notable for the route diagram over the doorway from vestibule to passenger compartment: a light moves along this to show the train moving along the route to or from the airport.
- At the airport, there is usually multi-lingual signage. The station usually has an internationally recognisable name (for example Gatwick Airport), and indicators showing the routes to the terminals.
- In flight, there is often information in in-flight magazines and sometimes (for example Singapore Airlines arriving at London Heathrow) on the arrival video.
- At the airport of arrival, there are usually internationally recognisable pictograms and high quality signage. In the early stages of Heathrow Express, to incentivise airport staff to promote Heathrow Express, Heathrow Express managers would pose as passengers and ask airport employees the best way to central London. If they gave the right answer, their names were entered into a draw for prizes including free flights.
- On the train to the city, information similar to that provided in the opposite direction is given, although with modifications to meet the needs of inbound rather than outbound passengers. For example, as Heathrow Express trains arrive at Paddington, information is given about onward travel by bus, London Underground and taxi.
- At the destination terminal, signage is provided to taxis, local buses and city transport.

Ticketing

There are moves to integrate ticketing with airline ticketing. The passenger is just making one journey: why should they need to buy three tickets?

Some airlines give their preferred passengers free tickets on Airport Expresses: Ryanair in particular is notable for selling Stansted Express tickets at check-in or in flight.

Arlanda Express and Heathrow Express are working with Amadeus to retail through GDSs – difficult historically because of the GDS charge, high in relation to a typical Airport Express fare.

Arlanda Express and Airport Express Oslo allow travel on frequent flier cards (SAS and Braathens).

Tickets can often be purchased on the web. At airport and city stations, passengers can usually buy from manned points or automatic machines – which gives those not knowing the local language a good choice. Usually tickets can be bought from ticket offices throughout the national rail system (this is true of all three UK examples, for example); and in Sweden, like most other travel, Arlanda Express tickets can be bought through the national chain of lottery retailers.

Frequent traveller cards are available on some services (Heathrow Express, Gatwick Express) as are season tickets for daily travellers (Gatwick Express and Stansted Express sell season tickets: they and Heathrow Express also accept the Airports Travelcard which gives significant discounts to airport staff to encourage use of public transport).

On some Airport Expresses – notably Heathrow Express - tickets are available widely. They are sold by Bureaux de Change, retail outlets at airport and city centre station, and by hotel concierges in London.

Fares

A premium fare can be a feature of the Airport Express. This usually reflects the premium service, but it can also be to recoup high up-front capital costs (Heathrow Express cost £450m initially, plus a further £50m for in-town check-in).

Especially where passengers have a choice between a premium fare premium service and a lower fare non-premium service, there is little customer reaction to this. Partly this is because, having paid an expensive air fare, the Airport Express fare is relatively low: equally the company often pays for a business trip so the individual passenger is not price sensitive.

In addition, the fare may be at a premium to the average, but it is typically half the cost of a taxi.

A return ticket on Gatwick Express will cost £21.50: low cost long stay parking costs £17.50 a day and fast track £22 a day. A return ticket on Arlanda Express will cost 320 SEK: this will buy 11 hours parking in short stay or 3 days in long stay.

Even at Stansted, the classic low-cost carrier airport, the premium priced Stansted Express is popular.

The main critics – usually uninformed – from the press seem to be keen to knock railways in general and Airport Expresses in particular.

For example the comment is often made that Heathrow Express costs more than Concorde: the comment that taxis cost twice as much as Heathrow Express and therefore twice as much as Concorde is never made. Heathrow Express is also said to be the most expensive railway or the most expensive airport railway: this is also untrue.

The journey between Leicester Square and Covent Garden costs £1.60 for 0.26 km, a fare of £6.15/km: the fare between Newark Penn station and Newark Liberty International Airport in New Jersey is £3.99 for 3 km or £1.33/km and that between Miyazaki and its airport is £1.84 for 3 km or £0.61/km. Heathrow Express at £13 for 26 km costs £0.50/km.

Where there are two classes of accommodation provided, there is a section of the market willing to pay a premium over the premium fare. The percentage share of passengers who are travelling first class is reasonable - 7% on Heathrow Express, 8% on Stansted Express and 12% on Gatwick Express.

In the period leading up to the launch of Heathrow Express, significant international market research was done. Two elements are of particular relevance.

- The first element was designed to aid the decision on the level of the fare. Research was conducted at a number of international airports in the main markets of Europe and North America. It described the service characteristics (especially the frequency and journey time) and asked potential passengers what they thought the fare should be. The highest estimate, in Frankfurt, was £28.
- Research was also done to assess demand and willingness to pay for first class on this short-distance premium fare service. The initial assumption was that it was unnecessary and unjustified for a 15 minute journey. However a reasonable percentage of potential passengers said that they would use it – and a significant sector of the market said that they would only use Heathrow Express if first class was provided. These were people like captains of industry, for whom the alternative was a limousine or company car.

Marketing

Marketing is also usually of high quality – press and television advertising, posters, station information, airport brochures and in-flight magazines are the usual media chosen. London's Airport Express grouping of Heathrow Express, Stansted Express and Gatwick Express regularly take stand space at major international travel exhibitions.

In their early stages, Airport Expresses often offer free tickets as an incentive to try the service. This is often geared to a database for marketing purposes, although sometimes local data protection laws may inhibit this.

Marketing sometimes compares the low stress and high reliability of the train with the opposite attributes of the car¹⁵.

A number of Airport Expresses publicise punctuality and reliability statistics – either internally (Heathrow Express, each month, in a Weekly Brief emailed to all staff: performance against targets is a factor in the year-end bonus) or externally as well.

- Gatwick Express, in common with many UK train operators, regularly display posters with their performance against targets. This dates from government interest in customer charters generally. For example for the year 2002/2003, 82.1% of trains arrived within 5 minutes of scheduled time, and 2.7% of scheduled trains were cancelled¹⁶.
- Airport Express Hong Kong's owner, the MTR Corporation Ltd., publishes an annual passenger pledge¹⁷. This shows targets compared with actual results for the previous year for punctuality and reliability as well as a large number of other service attributes (performance of escalators, ticket machines, ticket gates and the like).

Some of these feed through into customer service guarantees.

- If Heathrow Express delays you by more than 15 minutes, you are entitled to a full refund of the train fare.
- Arlanda Express is scheduled to take 20 minutes: if it takes more, the ride is free.
- If you miss your flight from Oslo airport and it is the fault of Airport Express Oslo, they will rebook you – easy on a full-fare business ticket, potentially expensive on a non-refundable non-exchangeable low-fare flight.

Image, performance and perception

The Norwegian Customer Barometer (Norsk Kundebarmeter) regularly measures customer satisfaction with major service companies in Norway: in the latest survey (2001) Airport Express Oslo ranked 5th overall and top by a long way in the transport sector.

¹⁵ for example Arlanda Express's advertisement in the October 2003 issue of SAS's flight magazine Scanorama – "No traffic jams. Arlanda Express is good for the environment and your mood".

¹⁶ Strategic Rail Authority Annual Report 2002/2003 page 146

¹⁷ For example "Our pledge for service 2003", showing that 99.9% of trains and of passenger journeys were on time

An IATA survey of 2002 showed that air passengers thought it was the best airport railway in the world.

Essentially, a dedicated service is easier to understand – especially for a visitor to a country.

Literature review

From the Executive summary

The (relatively meagre) literature on the subject is briefly reviewed. This helps to show where public transport as an airport access mode works, and gives some indication of the relationship between quality of service and demand.

There are four types of literature available on the subject – published reports, journal and periodical articles, academic research, and conference papers.

Published reports include

- the Institute of Air Transport’s “Rail/Air complementarity in Europe: the impact of high speed train services”¹⁸,
- Colin Buchanan & Partners’ “Optimising air rail intermodality in Europe”,
- the report of the COST 318 project, “Interactions between high speed rail and air passenger transport”

and two recent TCRP publications –

- number 62, “Improving public transportation access to large airports” and
- number 83, “Strategies for improving public transportation access to large airports”.

Because the first three looked at all types of airport access, there is little which is specific to the Airport Express.

To a degree, the same is true of the two TCRP reports. These did however analyse the reasons for high use of all forms of public transport (bus and train) for airport access, and the second made detailed recommendations on increasing public transport use. There are four key elements

- The service must go where people want to go
- There must be good in-town distribution from the downtown terminus
- A high quality seamless connection is strongly preferred and
- baggage handling needs to be satisfactory.

¹⁸ Paris, December 1991 – also published in French as “Les complémentarités train/avion en Europe”

Most journal and periodical articles on the subject have been contributed by authors of these reports (for example Matthew Coogan and Roland Niblett), by other members of IARO or by people with strong contacts with IARO (for example Michael Pearson). Hence their contents effectively are already incorporated into this report.

Similarly IARO strongly supports academic research on cognate issues, and has been in contact with several academic experts and students researching the field. These include

- Jacques J. Charlier of the Belgian Centre Interuniversitaire d'Etude de la Mobilité,
- Dr. Humberto Valdés Ríos of the Cuban Centro de Investigación y Desarrollo del Transporte (Transportation and Research Centre),
- Ouyang Jie of the Civil Aviation University of China Transportation College,
- Efstathios Kefallonitis and George Williams of Cranfield University,
- Dr. Philippe Roth of the École Polytechnique Fédérale de Lausanne,
- Achim Fränkle of Fraunhofer IML,
- Andrea Kaszewski of Imperial College London,
- Jean-Pierre Widmer of the Institut für Verkehrsplanung und Transporttechnik (Swiss Federal Institute of Technology),
- Adam Fularz of the Polish Instytut Rozwoju i Promocji Kolei,
- Dr. Young-in Kwon of the Korea Transport Institute,
- Mark Wardman, Bill Lythgoe and Kate Harrison of Leeds University Institute for Transport Studies,
- Mark Holloway of Loughborough University,
- Professor Callum Thomas of Manchester Metropolitan University's Centre for Aviation, Transport and the Environment (CATE),
- Prof. Nicolau D. Fares Gualda of the Universidade de São Paulo,
- Prof. Dr. Ing. Andres Lopez Pita of Barcelona's Universidad Politècnica De Catalunya,
- David Jarach of Milan's Università' Bocconi,
- Moshe Givoni and Melanie Roberts of University College, London
- Antonia Cokasova of the University of Zilina,
- Professor Andrew Goetz of the University of Denver Intermodal Transportation Institute,
- John Stubbs, University of Derby
- Thomas Brych from the University of Dortmund,
- John Black of the University of New South Wales,
- Rafal Pisarczyk of the University of Technology, Krakow,
- Hussein Chabli from the University of Texas at Austin,
- Paola Capon of the University of Trieste,
- Erik W. Griswold of the University of Washington and
- Koni Meyer of the University of Zürich.

Here too in a number of cases the results of the research have been incorporated into this report. Typically, researchers are looking at the potential for their own locality, their own country. Other topics of major interest are rail-air intermodality (which tends to be concerned with longer-distance rail substituting for short-haul air) or environmental issues - or the two combined.

The most relevant research here is that of Kate Harrison of Leeds University Institute for Transport Studies. Her MSc dissertation, "A revealed preference model of airport access mode choice", discussed the development of a model of airport access mode choice at Heathrow and Gatwick - basically by asking people which mode they had used, and then exploring why they had not used the other alternatives available.

Most relevant conference papers are those presented at the regular Air/Rail conferences, organised in conjunction with IARO by Baltic Conventions, Oakhill Media and Railnews Conferences. Again, the results have generally been incorporated into this report. A list of these conferences can be found at the back of this report.

Conclusions.

A number of examples of Airport Express exist, especially in Europe and Asia. More are under construction or consideration (Chicago, Toronto, Paris Charles de Gaulle, Vienna). The characteristics include

- Non stop or limited stop service between airport and city
- rolling stock designed or adapted to the special needs of air passengers
- marketing, ticketing and information systems also geared to the needs of the international travelling community
- a high level of on-train service quality.

Typically they carry 25% of terminating (non-transfer) airport passengers, with a range of 15% to 35% depending on the competition and local geography.

They often have a premium fare which does not appear to reduce usage significantly; and predominantly but not exclusively the user is from the business community.

They can be profitable – if that is the objective of the owner.

They provide a good welcome to the city and the country – an important selling point for places dependent on trade.

Even where there is a premium fare and strong competition, they still attract large numbers of passengers.

With the forecast growth in air traffic, an attractive high quality high volume service is needed to reduce road congestion.

It is concluded therefore that the Airport Express is a valuable component of the transport network between airport and city, attracting passengers from alternative and sometimes less environmentally friendly modes. Where the geography is right – a high speed railway close to a major airport – there is clearly scope for expansion in the interests of the travelling public.

IARO's Task Groups, workshops and conferences

Task Group reports are usually the topic of all or part of an IARO workshop.

Copies of the reports of the first (in Berlin in 1999) and second (Milan, 2000), are available price £250 (free to IARO members). Reports of subsequent workshops are in preparation: publication will be announced on www.iaro.com.

These workshops are very focused, dealing in detail with a restricted number of key issues, and complement the regular Air Rail Conferences. Workshops and conferences (with site visits) have been held as follows.

1993 - Zürich Conference

1994 - Paris Conference

1996 - London Conference (Heathrow Express, Stansted Express)

1997 - Oslo Conference (Airport Express Train)

1998 - Hong Kong Conference (Airport Express Line)

- Frankfurt Conference (with the AIRail station and the Cargo Sprinter)

1999 - Workshop 1: Berlin (the Schönefeld link)

- Copenhagen Conference (the Øresund Link)

2000 - Workshop 2: Milan (Malpensa Express)

- Paris Conference (plans for CDG Express)

- Washington Conference (Baltimore-Washington International Airport)

2001 - Zürich airport seminar: Air rail links - improving the partnership

- Workshop 3: Madrid (and its airport rail links)

- London Heathrow Conference (Heathrow Express)

2002 - Workshop 4: Amsterdam, for railways serving airports but not as their main job - "Help - there's an airport on my railway".

- New York Conference (the Airtrain projects)

2003 – Workshop 5: Barcelona – “Today’s design and funding issues for airport railways”

- Frankfurt Conference - Frankfurt/Köln and air rail integration (September)

- Workshop 6: Newark, New Jersey – “Practical Rail-Air Intermodality”



Planned workshops and conferences

2004 – Workshop 7: Oslo – “Leisure passengers: an opportunity for airport railways”

- Brussels Conference (Cargo)

- San Francisco Conference – Celebrating successful air-rail intermodality

2005 - Moscow Conference

Details are available from IARO, or on www.iaro.com/events.htm

Future plans are, of course, subject to change.