

Accessible Air Travel for the 21st Century

by

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BACKGROUND

Air travel offers everyone the opportunities to accomplish business and recreational trips in the timeliest manner. In the 21st century, airlines and airports will need to adapt to a changing air passenger profile and air industry structure.

The growth of the older population, and the increase of travellers with disabilities, will require that airports modify their facilities to accommodate passengers with special needs. The aging of the large baby boomer population represents a lucrative air travel market. By 2025 the population age 65 and over worldwide is anticipated to account for 10.7 percent of the population or about 835 million people. (1) India is second to China for the largest absolute number of Persons 65 and older, but in terms of national percentages, India does not even rank into the top 25 oldest countries (2) due to the large population and the lower life expectancy (under 60 for both sexes). Age and disabilities are often correlated. The total number of persons with disabilities in India is 21,906,769, 2.1% of the population (India Census 2001, censusindia.net). Depending on the source, this percentage can be as high as 80 million people or 8% of the total population. (3)

In the local context, the international and domestic air passenger movement in Delhi is accommodated by Indira Gandhi International Airport and Palam Airport respectively. Both the Airports have been linked to other parts of the city and suburbs through the road network. The Delhi Indira Gandhi International airport handled a yearly total of 7.8 million passengers in 1998. On a normal weekday, 56.46% of the commuters travel by road, 42.67% by rail and 0.87% by air. The Distribution of Daily Air Passengers in Delhi (Table 1) shows the volume of air traffic handled by the two Delhi airports. "In view of the growing importance of this Indian capital city at the international level, and the general increase in air travel globally, it is anticipated that air trips will experience a quantum jump." (4) Indeed, on January 11, 2006, Air India and Indian, its wholly owned subsidiary low-cost airline, have signed orders for respectively 68 (Boeing) and 43 new aircraft (Airbus). The Air India order, at more than \$11 billion the single largest

order by the airline in its history since 1953, is scheduled for deliveries beginning November 2006. (5)

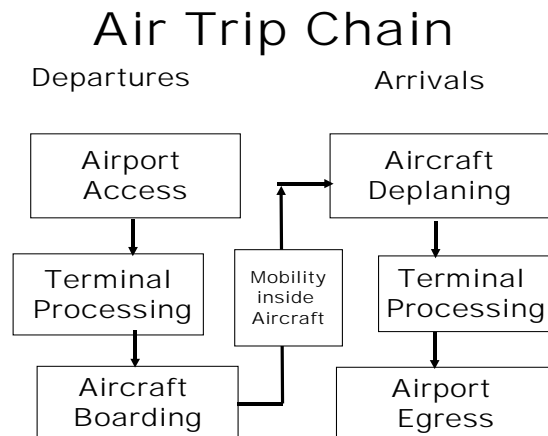
The passenger profile is also changing. The propensity of baby boomers to use air travel is expected to be far higher than what is experienced today. As frequent flyers, they will be more familiar and confident with air travel than previous age cohorts. They will also remain healthier for a longer period of time. If air travel is made more user-friendly to seniors and persons with disabilities, it is possible to double the air trip rates of these groups.

A new breed of carriers that emphasize low cost, fast turnaround and frequent service are emerging. Airports are being pressured to modify their terminal designs to eliminate unnecessary frills and focus on the basic needs of the carriers. The hub and spoke operation necessitates the increased use of regional jets and smaller aircraft which require junior jetways or low level loading bridges for boarding for passengers with reduced mobility. The accelerated escalation in fuel and energy costs, the post 9-11 heightened security measures and screening, and the technological advancements in wireless communication technologies, are all factors that need to be considered in planning and budgeting of an airline's operation.

Against the above backdrop, let us take a virtual air trip from the perspective of a typical air traveller, as follows:

THE AIR TRIP CHAIN (6)

The air trip chain can be divided into four segments: airport access and egress, passing through the terminal, boarding/exiting the aircraft, and moving inside the aircraft (See Figure 1). Because intermodal and multimodal transfers and handling travel documentation are common to all four links in the trip chain, it will be discussed at the end of this section. Efforts to enhance air travel accessibility must address all components of the air trip, including the issue of reciprocity and harmonization from origin to destination. Difficulties with any segment may discourage travellers from making the trip all together.

Figure 1 The Air Trip Chain

1. Airport Access and Egress

Airport access and egress are defined as the process of traveling to the originating airport and from the destination airport to the final stop.

Airport Access

Airport access to the originating airport is often easier than airport egress from the destination airport, because the traveller is more familiar with the transportation options to get there as well as the layout of the terminal facility. The challenges of access to the originating airport vary according to the mode of travel used and the associated costs and time involved. For most large metropolitan areas such as Chicago, Atlanta and London, traveling to the airport via train avoids roadway congestion during peak periods. In London, for example, it takes 30 minutes to reach the city centre by high-speed rail but one hour or more when traveling by road.

For metropolitan areas lacking convenient rail service, the private automobile can be used to reach the airport. Those who drive themselves to the airport must navigate airport roadways, find parking and locate the airport terminal. Once the car is parked in the garage or terminal parking lots, spatial orientation or walking distances for the traveller may be an issue. Therefore, it is crucial to include wayfinding information and signage within parking garages. Note that this mode choice may involve as many as three transfers, even before boarding the aircraft: the transfer from the automobile in the auto parking lot to a shuttle bus to access the terminal, the transfer to a people mover to reach the concourse, and the use of an electric cart to reach the gate. These transfers become particularly onerous to someone transporting a substantial amount of baggage or those with reduced mobility.

Instead of driving to the airport, the traveller may rely on a friend or relative for a ride. This obviates the difficulties associated with parking and reaching the terminal, and places the passenger close to baggage processing

areas. The disadvantage, however, is the loss of flexibility and independence. Buses and taxis can also be used. The former choice is schedule-dependant, while the latter could be costly.

The Indira Gandhi International Airport is located 12 miles (20km) south of Delhi and does not have a rail link to the city. It has two terminals: Terminal 1 is Domestic and Terminal 2 is International. "The International Terminal is 3 miles (5 km) from the Domestic Terminal. A free bus connects the two, and departs every 30 minutes. Taxis are the easiest way to reach central Delhi, especially for those not familiar with the city. Metered taxis are available but it is best to use pre-paid taxis (via the taxi counter in Arrivals), to eliminate any uncertainty over fares. Airport buses also leave for central Delhi 24 hours a day. Travel time to the city is about 30 minutes by taxi and 45 minutes by bus. Car rental (with driver) can be arranged in Arrivals. Avis and Hertz operate from the airport; however self-drive cars are not advised due to the erratic nature of Indian driving. Travellers with special needs should contact their airline in advance." (7)

Airport Egress

Egress at the destination airport involves a different set of challenges than access to the originating airport. Since the destination airport is generally less familiar than the originating airport, air travelers may have more difficulties with orientation and wayfinding.

When passengers emerge from the airport terminal to locate ground transportation for their ultimate destinations, identifying the location of shuttles, cabs, parking lots, people movers, etc. can be difficult, but excessive signage can result in information overload. An excellent method for simplifying this task is found at the Tokyo Narita Airport. Located outside the baggage claim area is a series of bays with numbers arranged in numerical order. Each number corresponds to a ground transportation option to facilitate identification. For those who park at the airport, finding one's car can be a frustrating experience. Often travelers become disoriented and are unable to determine from which direction they have departed from the terminal.

2. Terminal Processing

In general, the passenger drop-off location depends in part on the disposition of luggage. Checked baggage can be handled at kerbside or within the terminal at the ticket counter. Both options may result in waiting and standing in line. Travellers, who have carry-on baggage only, can proceed directly to security. The challenges associated with this option are: waiting in line for security check; lifting and placing baggage on to the conveyor belt; removing possessions from pockets, placing them in a container and then retrieving them once screening is completed. On the plane itself, placing and retrieving baggage from the overhead bins are particularly demanding tasks for seniors and passengers with disabilities.

"At the Indira Gandhi International Airport, passengers should be prepared for a certain amount of chaos; customs are slow, the queues for the x-ray machines are long and the staff at the endless security checks is rude. There are

no shops or restaurants of note. The only modicum of comfort is the Raj Lounge, where friendly staff is on hand to serve welcome drinks. Travellers with special needs should contact their airline in advance.” (8)

Walking

The walking distance involved in traveling from terminal point of entry to the gate depends on the type of airport terminal design and the transport facilities available. Linear terminals designed to minimize the distance from the terminal dropped-off point to the gate, are the easiest to negotiate. In the pier terminal concept, concourses often radiate from a central terminal or with gates on either side, long walking distances may be required. (Federal Aviation Administration, 1971). One method for minimizing walking distances in the pier terminal concept is to construct multiple short piers radiating out from a central terminal (Wolfe, 2000). This design, used at Los Angeles International Airport, is quite effective in reducing walking distances. In Delhi, both the international and the domestic airports are unit terminals, i.e. a single building with associated gates.

Walking through airport terminals is generally facilitated by mobility devices such as electric carts and moving sidewalks. While electric carts enable seniors and those with reduced mobility to traverse long distances without the use of a wheelchair, they have two limitations. Boarding and exiting the cart can be difficult for the passenger if there is a step to negotiate, especially with luggage. In addition, electric carts may be confined to certain parts of the terminal, thus requiring the passenger to walk to the gate part of the way. To be truly effective, electric carts should have a low floor design with their service areas expanded. For wheelchair users, personalized assistance from airline personnel is often the only solution, if accessible electric carts are not available.

Compared with carts, moving sidewalks are not as helpful to travellers with reduced mobility because they require standing. Maintaining a good balance while stepping on or off the device could be a problem. For those using walkers, the moving sidewalks may block the path of passengers who wish to pass. The entrance and exits of moving sidewalks should be clearly marked with audible announcements warning the approach of the beginning and end of the system.

The lack of adequate seating on people movers is unsafe for travellers who are prone to falls during acceleration and deceleration. The establishment of performance standards that call for a percentage of seats to be provided on each vehicle would be helpful.

Traversing vertical space entails moving from one terminal level to another and involves the use of elevators, escalators, inclined moving sidewalks or stairs. The preferred option for persons with reduced mobility is the elevator. All elevators should be easy to identify and locate, and should be wide enough to accommodate wheelchairs and baggage carts.

The risk of losing balance or falling, especially for someone carrying baggage, is higher in escalator use than elevators. Where escalators are needed, it is recommended that the edge of each step be highlighted in yellow for visibility. At airports (e.g. Atlanta) with unusually long and high escalators that cause anxiety to the user, the elevator option should be available.

Stairs are the most challenging option for traversing vertical space. Research shows that 30 percent of the people aged 75 and older have trouble negotiating steps. (9)

Orientation and Wayfinding

The physical and mental underpinnings of orientation and wayfinding challenges for the air traveler have been discussed in the *Access* and *Egress* sections above. These challenges are even more pronounced for travellers with sensory impairments. Pertinent and timely the information, adequate and visible signs, audible public announcements will help to alleviate anxiety of the traveller.

One solution is to simplify signs to make it easier to navigate through the terminal. The lettering on signs needs to be of adequate size, the contrast between the letters and the background easily discerned, and the information simple enough to facilitate cognitive processing. This applies to Flight Information Display Systems, "You are Here Maps," signs in the terminal, and information displays at the gate and at baggage claim. "You Are Here Maps" in airport terminals tend to be so complicated to be of little value. For example, at the Denver International Airport, some "You Are Here Maps" are three-dimensional, showing the layout of the airport on different terminal levels. While the maps are impressive, their complexity makes their value questionable. (10)

According to information presented by David Kessler of Kessler McGuinness during a presentation at the Association of American Airport Executives Annual Conference in Las Vegas, Nevada, June 2004, the three components of Flight Information Display Systems need to be properly integrated. These include the hardware – resolution and scan rate; programming - colors and font size; and installation - viewing angle and glare. Kessler also points out that the abundance of commercial signs in airport terminals may divert attention from the essential signs that facilitate wayfinding (Kessler, unpublished data).

New technologies have been explored as a means of assisting in orientation and wayfinding. Similar to Global Positioning Systems (GPS) installed in automobiles, Talking Signs (11) could be useful for travellers with visual impairments in airports. However, user acceptance and training are required to implement these effectively.

While enhanced maps and technology can facilitate way finding, seniors and persons with disabilities may prefer human guidance. Many large airports have volunteers to assist passengers in finding their way through terminals, but the uniforms worn and the procedures used vary from one airport to another. Standardization of uniform, badge and insignia to enable a volunteer to be immediately recognized at any airport, would enhance their visibility and encourage recruitment. These programs provide a human touch and reassurance to anxious travelers.

Appropriate terminal lighting and acoustical standards is the key. Lighting should be of adequate intensity while avoiding glare. Announcements should be clearly audible. More research needs to be conducted to develop both illumination and acoustical guidelines for airport terminals.

Check-in and Ticketing

In order to reduce the length of queues at the check-in counters, most airlines have introduced automatic ticketing and check-in kiosks. People who have problems with manual dexterity and tactile functions will have difficulty using them. Passengers may find its use intimidating, e.g. inserting a credit card or frequent flyer card in the kiosk slot to activate the machine and using the touch screen to respond to prompts. The demand for detailed information is particularly irksome. Touch screens may be difficult to use, especially for persons with arthritis. Questions that need to be addressed include: "Is the text on the screen large enough, and is it far enough apart to facilitate use by persons with manual dexterity problems?" "How easy is it to correct a mistake?" and "Are these information absolutely necessary?" Problems in using the touch screen not only tie up the machine longer than necessary, but also can create anxiety and stress among seniors and persons with disabilities. This is especially true if they have a short time before flight departure.

Waiting

In most large airports, passengers need to use the inter-terminal shuttle to arrive at the gate. Uncertainty in the arrival time can raise their level of anxiety. In addition, prolonged periods of standing may be a particular challenge when checking and retrieving baggage, and passing through security.

More stringent security requirements may lengthen the baggage check-in process, resulting in longer wait times. For example, the United States Transportation Security Administration (TSA) generally requires that 60 percent of checked baggage be subjected to open bag checks subsequent to automated screening procedures (12). New technology for detecting explosive devices may enhance security, but may be especially irksome for older adults and persons with disabilities because of longer wait times. While such systems are implemented in the interest of safety, efforts should be made to minimize their negative impacts on travellers with special needs in particular, and the travelling public in general.

Passing through security has become a major impediment to air travelers with impairments and older adults. Wait times for security processing during peak hours typically last 30 minutes or longer. When there are flight or gate changes, or when security procedures have been breached, passengers may be required to pass through screening a second time.

During the screening process, air passengers are required to remove personal belongings, place them in containers and then retrieve them. Individual searches of passengers who triggered screening devices could contribute to additional waiting and processing times. These issues may be addressed through:

- Administrative procedures that allow the passenger to remain seated until called for security processing;
- Priority processing for seniors and persons with disabilities;

- Efforts to streamline and enhance the efficiency of passenger screening on the part of the responsible authorities, and
- Common sense on the part of the passenger.

The last item noted above recognizes that some of the onus for reducing wait times rests with the passenger. For example, passengers can remove all items that might trigger a security device from their pockets, and place them in carry-on baggage. This reduces the time for the removal and retrieval of belongings while passing through security screening. The passenger can then retrieve the belongings in a seating area after going through processing or wait until he/she reaches the gate.

2. Boarding and Exiting Aircraft

In North America, large aircraft operating out of major airports are generally accessible via low level loading bridges or jetways. However, loading bridges may not provide access to regional jets and similar small aircraft (fewer than 60 passengers) or be available at smaller airports. In these instances passengers must negotiate many steps on steep staircases to board or exit the aircraft. This can be very difficult because of the narrowness of the steps, especially if the person has a carry-on bag. This may deter seniors and persons with disabilities from flying to and from a city that uses smaller regional jets and does not have a loading bridge.

Where airports use a bridge to board the aircraft from the terminal, some of the accessibility issues include: the length, the grade (walking uphill on exiting the airplane is difficult), uneven surfaces (making people susceptible to falls) and insufficient lighting. According to Mariana Figueiro of the Rensselaer Polytechnic Institute, Troy, New York, if the bridge is much dimmer than the terminal during the day, older adults may experience temporary blindness when exiting the jetway and entering the terminal (Figueiro, unpublished data).

There are ongoing challenges associated with boarding aircraft that do not use a boarding bridge. Various mechanical devices have been developed and deployed for this purpose, including manually operated stair-climbers, aircraft boarding lifts, integrated platform lifts and stairway systems. The "junior jetway" or a low-level boarding bridge is available for small aircraft in several airports, such as the Ottawa airport in Canada and the Philadelphia and Pittsburgh airports in the United States. The critical issue lies in the willingness of the airport operators buy and install these devices and for the airlines to operate them.

3. Movement Inside the Aircraft

Once on board, the width of the aisle and the layout of the aircraft are important parameters for the passenger with special needs. Some passengers may require assistance to circulate within the aircraft. The proximity of the seat to the washroom, the size and type of amenities available, and the location of the exit are also crucial. Other factors that will influence their comfort and convenience include movable armrests, ergonomically designed seats and availability of footrests. Easily reachable controls for lights and audio-visual equipment enable the passenger to be more self-reliant. It is also important for all passengers to

understand the safety briefings. If they have visual, hearing or cognitive impairments, the airline personnel should provide individual briefings.

In the United States and Canada, it is mandatory for air carriers to screen and brief passengers seated in an exit row. Only passengers who are willing or able to activate an emergency exit and to ensure safe use of the exit should be assigned exit row seats. (13)

Passengers using mobility aids such as canes, crutches or manual wheelchairs, need to store them in a safe and easily retrievable location. Electric wheelchairs need to be stored in the luggage compartment of the aircraft, with the batteries packaged properly. Note that some regional jets cannot accommodate electric wheelchairs in its cargo hold. For wheelchair users and those requiring assistance to use the bathroom, onboard chairs such as the "Washington Chair," operated by the flight attendant, might be required. While larger aircraft have accessible washrooms that can accommodate these mobility devices, the access to those in small aircraft could be compromised.

4. Transfers

During the access and egress process, the air traveler must transfer between transportation modes, as often as three times mentioned above. However, for those who use a wheelchair, the transfer between modes also involves a transfer from his/her own chair. On a typical trip, starting at the check-in counter and arriving at the baggage claim at the destination, the wheelchair passenger must be physically transferred two to six times by attendants or agents, depending on the type of aircraft. There is no technology to transfer from onboard chair to the aircraft seat. If one needs to use the onboard washroom, the process involves transferring at least four times. When passenger leaves his/her own wheelchair, the safety of the chair in good working order at the end of the trip is often a concern. (14)

5. Handling Travel Documentation

All traveler is required to carry an array of travel documents such as air and ground transport tickets, credit cards, medical and accident insurance papers, passport and visas, custom clearance forms, airline frequent flyer cards, foreign currency and travelers checks, etc. Handling travel documentation occurs during check in and ticketing, custom clearance and security processing stages within the air terminal.

For travellers with agility and dexterity limitations, the handling of documents and the completion of forms can be a real challenge. Most documents are in small print (smaller than 14 point) and are hard to read. Any traveller, fumbling over papers and contents of wallets, is prone to lose some in the process, especially when he/she is stressed and flustered. Crowded conditions further aggravate the problem.

Usually, neither seating facilities nor pens are readily available for the completion of custom forms, nor desktop space for placing briefcases or handbags. This can be addressed by providing designated "quiet rooms" for travelers with disabilities and for older adults who need human assistance and a

calm environment to deal with the required travel documentation. Designated counters for security and custom clearance with seats available for waiting and questioning can also be helpful for those with special needs, including families with young children and babies. Forms with larger print should also be available. Another approach could be to have forms available from travel agents during the ticketing process to be completed in advance.

RECIPROCITY AND HARMONIZATION

In the era of globalization, air travel plays a pivotal role in transporting people and goods around the world. On April 15, a day after the United States and India signed an “Open Skies” aviation agreement (15), the U.S. Transportation Secretary Norman Mineta announced that the United States is committed to helping India realize its full economic potential by assisting in the development of its transportation infrastructure.

The “Open Skies” agreement between the United States and India allows each country’s air carriers unlimited access to each other’s markets. In order to serve the needs of seniors and persons with disabilities, discrepancies between the accessible air travel regulations of the two signatories must be reconciled. Inconsistencies in the requirements at the point of origin, transfer and destination will either make air travel difficult or impossible by these target groups.

Reconciliation can take two forms. One involves reciprocity in the eligibility of individuals with disabilities to receive certain accessibility services. If the two countries recognize one another’s eligibility requirements, then an individual flying between the two nations can be certain that assistance will be available at both ends of the trip chain.

Another means of reconciling discrepancies involves efforts to harmonize the United States and India’s accessible airport and air travel regulations. In the United States the Americans With Disabilities Act (ADA) and associated regulations cover the requirements for making airports and aircrafts accessible. In addition, in the United States, a new set of air carrier accessibility regulations are currently undergoing review and comment. Seizing this opportunity, now is the time to harmonize different practices through the International Civil Aviation Organization (ICAO) to achieve a uniform set of standards applicable to all its 188 member states.

CONCLUSIONS & RECOMMENDATIONS

While considerable effort has been placed on enabling seniors and persons with disabilities for daily travel, less attention has been given to intercity and international trips. This lack of attention can be attributed to the barriers to pursuing and implementing solutions summarized in Table 2.

The good news is that facilitating the air trip chain offers a growing market to airlines and airports. As previously noted, by 2025 there will be 835 million people worldwide 65 years and older. Recommendations for Enhancing Air Travel Accessibility listed in Table 3.

These recommendations, however, need further evaluation and proper integration. Prior to pursuing them, certain actions need to be taken, including:

1. Enlisting the support of government authorities, airline industry, airport operators, aircraft manufacturers, ground transport operators, consumers, researchers and the public to become engaged in making air travel more accessible for seniors and persons with disabilities;
2. Holding a workshop to define the standards that need to be established. This would call for:
 - Securing funding for the workshop;
 - Attracting a multi-disciplinary team of experts to be convened to define the standards that need to be established; and
 - Requesting that research papers be prepared on specific topics in advance of the workshop, which would provide the focal point for subgroups in defining the standards.
3. Establishing specific standards through established organization such as the American National Standards Institute (ANSI, 2004) and the International Civil Aviation Organization (ICAO, 2004).

Making the air trip chain accessible for travellers with special needs would benefit all air passengers. Families traveling with children; travelers weighed down with baggage, computers and other paraphernalia; foreigners unable to speak the local language, and athletes with knee injuries also have special needs. Improving air travel accessibility offers benefits to all travelers, and to the airports, airlines and other transportation providers that serve them.

APPENDICES**Table 1 Distribution of Daily Air Passengers in Delhi, India**

Airport	No. of Travelers	No. of Visitors, Staff	Total
Domestic Airport	12450 (82.0)	2650 (18.0)	15100 (100.0)
International Airport	10120 (77.0)	3000 (23.0)	13120 (100.0)
Total	Total 22570 (80.0)	5650 (20.0)	28220 (100.0)

Source: draft Transportation Policy 2005, India, page 98

TABLE 2 Barriers to Air Trip Enhancements

Barrier	Description of Issues
Recognition of issue	Improving air accessibility for seniors and persons with disabilities are not recognized explicitly in most transportation policy and plans.
Priority given to issue	Even if the issue is recognized, it is not perceived as a high priority. Airlines are fighting for their existence, and airports are trying to cope with security requirements.
Lack of standards	There is a need to define required standards, and then to establish them in a rigorous and scientific manner.
Prejudice	There is a perception that improving air accessibility for the target groups will be at the expense of other age groups. Seniors and travellers with disabilities are viewed as contributors to delays and inconvenience for other passengers.
Lack of grass roots support	The marketplace responds to consumer demand; to date the demand for change has come from planners and from transportation specialists.
Cost	The cost of implementing enhancements may be perceived as greater than the benefits to be derived.
Impact on operations	Accessibility improvements may not take into account the impact on airports and airlines.
Lack of integrated solutions	Accessibility improvements to different parts of the air trip chain must be integrated to ensure connectivity and seamless service.
Marketability	The concept of universal design has existed for many years. It has not been marketed and packaged in the same way as “green building”, and therefore has not been as successful thus far.
Changing technology	Solutions to challenges are based on today’s conditions and do not take into account the impact of changing conditions or technologies.
Credibility of proponents	The airport operators and airline industry may not view the proponents for accessibility as credible.

TABLE 3 Recommendations for Enhancing Air Travel Accessibility

Air Trip Component	Recommendation
1. Airport Access and Egress	Broaden modal choices and offer rail transit to airports in large metropolitan areas, minimize number of transfers, provide signage within parking garages, simplify signage and system for finding ground transportation, make it easier to board shuttle buses.
2. Terminal Use Walking Orientation & Way finding Check-in & Ticketing Waiting Travel Documentation Transfer	Expand circulation areas for electric carts; add seating to people movers; clearly mark escalators, moving sidewalks, elevators and stairs. Align maps with building orientation; simplify signs and enhance readability by taking into account the font size and the color contrast between the letters and background; integrate the three components of Flight Information Display Systems, hardware, programming and installation; deploy technological devices to assist in wayfinding; make use human volunteers. Conduct human factors research on the use of automatic check-in kiosk by passengers and the acceptability of touch screens, especially for seniors and persons with disabilities; offer human assistance. Employ administrative procedures to minimize standing in line, streamline passenger screening, provide more available seating; install passenger information systems to show arrival time of inter-terminal trains. Ensure forms are legible and easy to read; provide quiet rooms for those requiring assistance in a calm environment; provide special counters for security and custom clearance with seats for waiting and questioning. Improve training for agents handling transfers. Streamline procedures to reduce transfers to a minimum. Investigate and develop new technologies.
3. Boarding/Exiting Aircraft	Enhance boarding bridges to reduce likelihood of falls; where boarding bridges are not available, use mechanical devices to assist with the boarding process; purchase and install junior jetways for boarding smaller regional aircraft.
4. Movement Within Aircraft	Design cabin to be more conducive to seniors and persons with disabilities, considering such enhancements as movable armrests, ergonomically designed seats and foot rests; provide textual and audible safety briefings; ensure access to washrooms and include appropriate amenities within.

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