

single-purpose statutes, such as the FAA exit row seating rule, that also impact upon passengers with disabilities. Finally, there is prospective legislation that may be far-reaching and which may make some of your current efforts obsolete.

Although this welter of new and existing requirements may seem undecipherable, the situation today actually is much less confusing than it was in the past. For one thing, you probably have a much better understanding of what persons with disabilities want and need. The same

holds true for Federal agencies. Second, what appeared unusual or even unrealistic now has begun to seem natural. You are becoming sensitized, and so are we. Finally, your presence here today signals your readiness to take action. If you're uncertain where to begin, look to your individual communities, as well as to your legal counsel. The community is almost certain to contain a number of groups, representing persons with disabilities, who will welcome your interest.

APPENDIX C

THE AIRPORT AS AN ACCESSIBLE FACILITY: THE USER'S VIEW

James Bostrom, Ruth Hall Lusher, and Ronald Mace, FAIA

OVERVIEW

Of the million who pass through airports each day perhaps a majority have some type of disability or have a close friend, colleague, or family member who is disabled. People with disabilities are like "everyone." They are of all ages and occupations. They have families, children, and business associates. They travel for business and pleasure. They travel alone or with others who may or may not have a disability of their own. And, most important, they are people with the same time constraints as other travellers—one flies because it is fast. Travellers with disabilities want and demand access to the same services, conveniences, and facilities provided to "everyone."

A brief look at statistics as well as the issue at hand will illustrate that virtually "everyone" will have a disability of limitation at some point in his or her life. (It is also important to remember that disability itself is not a medical issue. Although a particular disability may be the result of a medical condition or may have a medical condition associated with it, the disability per se has nothing to do with "illness.") A 1986 study by the Bureau of the Census concluded that of the noninstitutionalized adult population, approximately one-fifth had a functional limitation(1). The proportion of people with functional limitations varied by age and ranged from a low of one-twentieth of those aged 15-24 who are entering the job market, to one-seventh of those aged 35-44 who are often at the peak of their careers, to more than one-third of those aged 55-64 who may be nearing retirement. And finally, more than one-half of those

aged 70-74 and almost three-quarters of those 75 years and older have functional limitations.

These numbers do not include others who also benefit from many "accessibility" features in airports or other buildings: children who benefit from the lowered drinking fountain and bathroom dispensers, parents who often push their children around in strollers, people with temporary impairments, the families or friends of people with disabilities, and almost anyone who goes to an airport with lots of luggage. It is therefore realistically stated that in providing "access" at the airport, we can accommodate everyone.

The most compelling reasons for creating universally usable airports are the human needs of people—all people—as they travel. There are clearly large numbers of people who do now and who will in the future, benefit from accessible features in airports. The features needed are for the most part well known, easy to provide, unobtrusive, and usable by everyone.

The market and the technology exist. What is missing often is a positive attitude, an understanding of related policy implications, and a commitment to apply the technology universally.

If the market factors are not a driving force, access legislation is. There are laws that mandate a certain degree of accessibility in airports. Early laws emphasized technical requirements for building accessibility whereas more recently enacted legislation has stipulated access to programs and has mandated nondiscrimination. Combined, the existing legislation applicable to airports can require fairly extensive accessibility in the facilities, services, and policies of airports.

The Architectural Barriers Act of 1968 and amendments require that buildings designed, constructed, altered, or leased with Federal funds meet minimum accessibility standards. Airports can fall into this category. Section 504 of the Rehabilitation Act of 1973 requires all programs that receive any form of Federal assistance to be accessible to everyone. Federal assistance for runways, tarmac, and other facilities requires altered and newly constructed terminals, whether or not they are directly funded with Federal money, to conform to minimum standards for accessibility. Providing accessibility in existing facilities is also one way to create "program accessibility."

The Air Carriers Act of 1986 requires airlines to provide nondiscriminatory services to persons with disabilities. Recently issued regulations will establish uniform policies and procedures for all airlines and, under some circumstances, require airlines to conform to minimum accessibility standards for facilities over which they have design control. The Public Accommodations requirements of the pending Americans with Disabilities Act of 1990 (enacted July 1990—ed.) will require that most businesses and public services in airports provide services to all people with disabilities. Thus, restaurants, shops, banking machines, vending machines and similar facilities will have to become usable by everyone. Together, these laws clearly lead toward a universally usable environment.

AIRPORT ACCESSIBILITY ISSUES FROM THE USER'S VIEW

There are four broad types of disabilities: mobility impairment, visual impairment, hearing or auditory impairment, and cognitive disabilities. The following section identifies key problems encountered and accessibility concerns of people whose disabilities fall into these broad categories. This section is illustrated with anecdotes of actual experiences of people with disabilities who travel frequently for employment reasons and is written with the attitude that independent access and freedom of choice are as essential for people with disabilities as they are for everyone.

Each person, with or without a disability, has a unique perspective but shares common problems in attempting to travel by air. For example, while people who drive to the airport must be able to find a parking space, people who need accessible parking must be able to find an accessible parking space. They may also need to drop off their luggage, then park their car and return to check-in to receive papers for their power wheelchair.

Facility accessibility is further complicated by policy decisions made by airports and the airlines themselves. The following section briefly discusses key problems/accessibility issues and a few related policy issues from ground side to aircraft.

Accessible Parking

While most everyone recognizes that accessible parking is essential, the stories about parking problems abound. People arrive at the airport and drive around and around in search of an accessible space only to find one located a great distance from their airline. Or you arrive at the airport to find that the spaces you usually use are now marked "one hour only." Or you find a marked accessible space that is too narrow to allow you to get out of your car. Or you arrive at satellite parking only to find there is no accessible transportation or no way to call the accessible shuttle van. Then, dropping off the luggage at the curb side check-in, you find you have to circle the airport to return to parking. These experiences raise the following questions:

- Are accessible spaces available adjacent to accessible routes leading to each airline ticket area?
- Is there signage providing direction to accessible parking?
- Are the spaces appropriately designed according to the standards?
- Are they connected to entrances with accessible routes?
- Do satellite lots have accessible parking?
- Is an accessible, lift-equipped shuttle van available during all hours the airport is in operation?
- How can travellers make arrangements?
- Can people who choose to do so drop luggage off and still access parking without having to circle the airport?
- Are parking information numbers published where people can get more information about parking?
- Are these numbers accessible on TDD?

Curbside Check-in

Curbside check-in can be beneficial for everyone if long lines and luggage do not obstruct access and the flow of travellers into the terminal and if airline policy facilitates use by users of motorized wheelchairs or mobility-impaired or visually impaired persons who may need assistance to the gate. Some travellers have waited in

line curbside, waited in line at security, and waited in line at the gate, only find out that certification of batteries and paperwork for motorized wheelchairs can be provided only by the front ticket agents. These experiences raise the following questions:

- Is there ample space so that queues do not obstruct access?
- Do airline policies allow for curbside check-in for users of motorized wheelchairs?
- If airline policies preclude check-in of motorized carts and wheelchairs at curbside, have skycaps been trained to assist wheelchair users with their luggage inside to ticket agents to obtain appropriate papers for transporting batteries?
- Is assistance to the gate provided when requested?

Entrances

Automatic sliding doors, which are common at airports, provide the best and easiest access for everyone. They provide the widest opening and do not swing into the path of travel. While the large three-wing revolving doors can provide access, they are difficult for many to use. They often move too fast and cannot be stopped. Swinging and double doors slow traffic and can cause crowding and must be protected on edges to assure safety. Edge/side protection narrows the traffic flow. These experiences raise the following questions:

- Are entrance doors automatic?
- Do they meet the requirements of accessibility standards?

Ticket Lines/Check-In

Problems are often encountered in check-in and ticket lines. Corrals for queues may not provide sufficient width for wheelchair and luggage. Adequate space may not be available at the counter to allow check-in of wheelchair users as well as passage width for other passengers. Counters are often too high to facilitate communication between ticket agents and travellers using wheelchairs or those of short stature. Personal assistance may not be offered, or it may be forced on travellers with visual impairments or mobility impairments even when not requested. One visually impaired traveller who makes the same trip from the same airline, same gate, on a regular basis reports that the airline will not let him leave the ticket counter without an escort. These experiences raise the following questions:

- Is adequate space provided for wheelchair users and their bags in corrals and at ticket counter?
- Are ticket counter heights within the reach of wheelchair users?
- Is there a lower area for use in signing credit slips or forms?
- Is assistance to gate provided upon request, but not required by the airline for those wishing to progress independently?

Accessible Route to the Gate

Level Changes

When level changes are necessary, it is essential that the elevator be easily located and accessible for independent operation. There is nothing as frustrating as being in a hurry to catch a flight and seeing the escalator but being unable to find the elevator. These experiences raise the following questions:

- Is the elevator easily located or is it tucked around a corner into a corridor without good signage?
- Does it provide for independent use, i.e. comply with accessibility requirements for space, controls, signage, and for audible and visual cues?

Distance

Wheeling or walking long distances can be difficult or impossible for many people. Various methods can be used to provide assistance in traversing distances: electric carts, personal assistance, moving sidewalks, people-movers or automated guideway transit, and mobile lounges (as at Dulles International Airport). Hard-surfaced pathways down carpeted corridors can make it easier for wheelchair users to wheel themselves to the gate as well as provide a wayfinding cue for people with visual impairments.

Not all methods are equally useful for everyone. For example, most wheelchair users and some ambulatory mobility-impaired travellers cannot use common electric carts. Many of the moving sidewalks have signs posted prohibiting use by wheelchairs. Many walkways have slopes that exceed allowable ramp slopes defined in the standards and do not meet other access requirements such as level areas every 30 feet, handrails on both sides, etc. These experiences raise the following questions:

- Do pathways to gates promote independent travel?
- Do these pathways meet accessibility requirements contained in the standards?

- Do people movers and mobile lounges provide accessibility and both audible and visual cues?
- Can moving walks be used by wheelchair users?
- Are there alternatives to electric carts for access to gates?
- Is personal assistance to the gate available upon request?
- Are wheelchair users free to choose to use their own chair to the access gate?
- Can ticket agents provide directions and a realistic estimate of the distance to the gate to facilitate choice?

Security

Although every airline passenger recognizes the need for security, virtually no one appreciates the traffic tie-ups, delays, and fuss associated with it. People with disabilities continue to encounter great difficulties as well as embarrassment. Access through security can mean tables have to be moved out of the way. People are asked if they can leave their wheelchairs or walk or stand without assistance. Hand checks of a person's body are becoming more common. Privacy is not provided. People with disabilities have been told they had to be escorted to the gate beyond security, and that they must wait for an escort. Security officers have even drawn guns when such directives were ignored. Clearly this is one area that needs attention. These experiences raise the following questions:

- Does the security area have gates designed to permit wheelchair access without sounding the alarm or moving tables?
- Are security personnel trained to be sensitive to and respectful of the privacy needs of people with disabilities?

Restrooms and Drinking Fountains

An unfortunate holdover from earlier standards is the idea that a minimum of one accessible feature is acceptable. Nowhere is this more of a problem than at airports. Passengers who arrive at the gate often travel a great distance only to find that the one accessible restroom or drinking fountain is back on the other side of security. All restrooms and drinking fountains should provide for accessibility. Accessible restrooms should provide at a minimum one standard (5'x 5') accessible stall with properly placed grab bars, an accessible lavatory, and easily reached dispensers. A three foot wide stall with grab bars on each side will better

accommodate ambulatory people with mobility impairments. A common problem in restrooms is poor design, which forces people to walk or wheel between the lavatory and paper towel dispensers or blow dryers, a great difficulty for wheelchair or crutch users. Maintenance is also a problem. Wet floors can be extremely hazardous for everyone but especially so for people who walk with crutches.

Other problems exist in the fit between some airport wheelchairs and the ability to use the restroom independently. Not only do airports frequently purchase chairs without wheelrims, but travellers being escorted from one flight to another at a hub airport are shocked to find that the airport wheelchair, fitted with a tall antitheft device, will not fit into the accessible stall.

A further need exists for a private toilet room facility where a person with a disability can receive assistance of a person of the opposite sex, have enough space to take a medication, or to straighten one's clothing in privacy, similar to the nursery areas provided at many airports.

Restrooms are areas that lend themselves to the development of universal products to save energy and water while providing a high level of accessibility. Hand dryers and lavatory faucets are now available that turn on and off automatically when hands are placed under dryer or faucet. These experiences raise the following questions:

- Does restroom design and airport equipment promote independent and accessible use of the facilities?
- Do toilet rooms provide three foot wide toilet stalls with grab bars on both sides in addition to the five foot wide standard stall?
- Are toilet rooms well designed and maintained to reduce or eliminate wet floors?
- Are unisex toilet/medication areas available where someone can receive assistance from a family member of the opposite sex?

Concession and Services

It seems everyone needs to pick up that last-minute gift or to stop by a concession for a snack. But getting a wheelchair into some of the tiny gift shops at airports is often impossible. Small self-service concessions may not have staff to provide assistance to those who can't carry trays to a table. And frequently tables are at a height appropriate only for a standing person. If seats are provided at all, they are high stools. Bars and restaurants commonly have the great majority of seating raised a step or two above the floor, or fixed seating that does

not allow wheelchair access. The scoping provisions in accessibility codes often do not preclude inaccessible dining areas. Counters at candy stores and other concessions are often too high and piled up with additional goods that making it difficult for even a standing person to receive his or her purchase from the clerk. It is interesting to note that in the airports visited recently, insurance desks seem to be the only ones consistently placed at a level accessible to everyone. Cash machines and car rental desks also need to be accessible. These experiences raise the following questions:

- Do concessions provide adequate space and maneuvering room for independent access?
- Do they provide accessible seating areas?
- Do concessions provide assistance to people who need help carrying trays to their tables?
- Are cash machines and car rental desks accessible to wheelchair users?
- Are direct line phones to taxi companies, car rental companies, and hotels accessible to users of wheelchairs and equipped with volume controls?

Signage and Communications

Airports are complex and often confusing facilities, especially for travellers who are unfamiliar with the facility. People read signage in different ways: some people must read signs at a distance, others at close proximity (within inches), others read signage using raised letters or braille and others must use auditory signage. Good directional signage is essential for everyone. Words as well as pictograms are important since many people have difficulty in interpreting pictograms. The accessibility standards call for high-contrast lettering with plain sans serif characters for assisting in readability. The issues of character size and viewing distance have not been resolved. Permanent rooms and spaces should also have raised/tactile signage placed at 54 to 60 inches above the floor on the latch side of the door.

Telephones are essential communication devices. They are needed by everyone, including travellers who use wheelchairs or hearing aids or who need increased volume. A universally designed pay phone is currently available that provides a volume control as part of every unit and can be installed to be accessible to everyone. Pay phone TDDs are also available and essential to people who are deaf or speech impaired, who need to communicate with deaf family members or colleagues, or who have other communication difficulties.

Flight and gate information and changes are generally provided only in a visual or an auditory format. Visually and hearing-impaired travellers will have great difficulty in obtaining information provided in the format inaccessible to them. It is therefore essential that critical information, such as last-minute gate changes, be provided visually as well as through auditory announcements. Stories abound about the deaf traveller who went to the appropriate gate only to miss the plane, which came in at a different gate on another concourse. Of course, the deaf traveller was told "we made several announcements on the PA system." Baltimore-Washington International (BWI) airport has recently installed information monitors to provide paging and other information for deaf travellers. Of course, directional and informational signage telling deaf travellers of these devices, their location, and the location of the pay phone TDDs is essential if the deaf community is to make use of these devices. Likewise, where not all toilet or other facilities are accessible, the use of directional signage and the use of the access symbol on facilities that are accessible is essential. These experiences raise the following questions:

- Is adequate directional signage provided?
- Does it have words as well as pictograms?
- Are letters plain sans serif characters?
- Do words and pictograms have a high contrast with the sign background?
- Is at least one telephone in each bank accessible to wheelchair users?
- Does at least one telephone in each bank have a volume control?
- Are all telephones hearing aid compatible?
- Are pay phone TDDs available?
- Are information monitors provided?
- Is informational as well as directional signage to TDDs and monitors provided?
- Is critical information (e.g., last-minute gate change, etc.) provided visually as well as through auditory announcements?

Gate Access

More than any other single feature, the modern day boarding ramps or bridges, designed to make access easy for everyone, have made it possible and even easy for people with severe mobility impairments to reach the aircraft. It is therefore particularly frustrating to encounter serious problems. Some boarding ramps are designed to incorporate steps midway down the ramp. Another encountered by the authors had two steps

immediately inside the door to the ramp. Steps immediately inside a door are hazardous to everyone and are in violation of most building codes. This unfortunate situation is in an airport constructed within the last five years.

Many older airports like Washington National Airport and small commuter airports have at least a few gates which don't allow for level boarding. In such situations, airlines often resort to carrying boarding chairs up the steps or using stair climbing devices. Both methods are inherently unsafe and unsettling to passengers. Yet while passengers are being hoisted up stairs strapped to a chair, food and beverage carts and the caterers' personnel are being raised to cabin level on an enclosed hydraulic lift truck. It seems that as much could be done for the passenger.

Other ramps installed for jumbo jets (but often used on smaller jets) result in steep slopes in excess of those allowed for accessibility. At times they are so steep that wheelchair-using travellers and escorts virtually slide down to the jet door.

"Handicapped" seating is often reserved by placing the international symbol for accessibility on a few seats inside the door to the jet gate. Why not identify and reserve a small seating area for families with children, children travelling alone, or older people, as well as people with disabilities; or simply all people who may need assistance boarding and are usually preboarded by airline personnel?

Elevators or dumbwaiters large enough to take power wheelchairs, three-wheel motorized scooters, and luggage should be located conveniently near gates to facilitate the movement to and stowage of these devices in the airplane after use by the traveller. At many airports, these expensive mobility aids are dragged down the narrow stairs of the jet gate, a procedure which is unsafe and which often leads to damage of the device. These experiences raise the following questions:

- Are jet boarding ramps provided?
- Are they free of steps and steep slopes?
- Is a seating area, not labelled "handicapped," provided for those who may need assistance or who preboard the plane?
- Are elevators or dumbwaiters large enough to accommodate motorized wheelchairs and luggage located conveniently near the gate?

The Challenge of Connecting Flights at Hub Airports

The increased use of the hub-and-spoke concept by the airlines has resulted in a growing number of connecting flights with fewer direct flights to any chosen destination.

Given the inevitable late arrival of flights, connections can become harrowing. People with disabilities and older people are often the last off a flight and often must rely on assistance to get to their connecting flight. Wheelchair users may also need to stop at accessible restroom facilities between flights if they are not available on the airplane. Prompt deplaning is therefore essential if connections are to be made on time. (Virtually all toilets on aircraft are inaccessible.) Of course, the first priority is that wheelchairs and needed escorts arrive promptly upon landing.

Intraterminal Travel

The tales told by travellers are troubling. Older people, children, and wheelchair users have been taken to holding areas where their tickets are taken away from them. They are parked in wheelchairs which preclude independent use, told to transfer into a stationary chair, told they can't go to the bathroom without escort, or simply that they have to wait. Surely independent mobility, where possible, would be a better way. Wheelchairs should have hand rims that allow independent operation and assistance should be provided only when requested, not forced upon people made helpless by the airlines' equipment choices. These experiences raise the following questions:

- How is travel to the connection flight facilitated?
- Is equipment and personnel assistance/escort service readily available?
- If electric carts are used, will they accommodate wheelchairs?
- Do wheelchairs allow independent use or restroom facilities and, if requested, independent movement to the connection flight?

Interterminal Travel

Some larger new airports have "people movers," which are generally accessible. But, more often, interterminal transportation is accomplished by shuttle buses, few of which are accessible. Frequently, airlines may operate one lift-equipped van which must serve all the airline passengers unable to use the shuttle buses. Waiting times can be long. These experiences raise the following questions:

- Is there an accessible means of transport to other terminals?
- Must the traveller call to make arrangements?
- How many vehicles are available and, realistically, how much time will it take?

Arrival and Baggage Claim

Many airlines will bring passengers' wheelchairs to the boarding ramp area. Whether motorized wheelchairs or three-wheel carts can be brought up to the gate is frequently dependent upon how close to the gate an elevator or dumbwaiter is located to raise the device up to the boarding gate level. Where this service is not available, the passenger must be transported to the baggage claim area where the wheelchair and luggage can be claimed. The wheelchair is usually brought to the "large item door" where assembly is often necessary for powered chairs. Often, reassembly results in damage to sensitive electronics. These experiences raise the following questions:

- Will the airline bring the travellers' motorized wheelchair or cart up to the boarding gate area?
- If not, is transportation to the luggage area provided?
- Is assistance provided to reassemble the travellers' wheelchair?

Ground Transportation

Airports generally provide several types of ground transportation services including limousines, taxis, and shared-ride shuttle vans. Some wheelchair users can use the limousine or taxi service. Those areas where services are provided must be accessible. Some of the shared-ride shuttle bus services also have accessible vans, but these services frequently require 24-hour advance notice, and there is rarely any advance information given to the traveller flying in. These experiences raise the following questions:

- Do taxi companies or the shuttle vans provide lift-equipped service?
- Must travellers call in advance to reserve the service?
- How will travellers find out about this requirement?
- Is the local mass transit system accessible?
- How do travellers find it?

SUMMARY AND RESEARCH RECOMMENDATIONS

Throughout the world, there are hundreds of standards, both design and performance, used in planning, designing, and constructing facilities including airports. Some of the standards address designing for travellers

with disabilities in great detail while others are more general. Standards are intended to be relatively simple, straightforward, and cover the most common cases. Of necessity, standards deal with elements, leaving the overall design and integration and combination individual elements to the architect or designer. Since airports are complex, with specialized facilities not specifically addressed in general type accessibility standards (such as ANSI A117.1, Standard for Buildings and Facilities Providing Accessibility and Usability for Physically Handicapped Persons), the designer must be especially sensitive and thoughtful in applying provisions. Moreover, these provisions for airport design must be applied consistently throughout the country (one has the right to expect that the features available in California will also be available in Texas, Massachusetts, North Dakota, or Virginia).

Accessibility to facilities and services must be provided regardless of the type of airport (feeder, hub, or destination). Time plays a major role. For example, if you have 30 minutes to change planes and must use the toilet, get something to eat, or make a telephone call, you must have facilities to support these needs.

Most airport authorities and designers are sensitive to providing the features mandated and meeting minimum accessibility standards or the notion of a "few special features for a few who must travel on an occasional basis." They often have no idea that:

1. The scope of the minimum standards is too limited.
2. The features specified are not always the best. Example: the water cooler specification is awkward for everyone.
3. Some choices in the standards should not be choices. Example: wide versus narrow toilet stall. Stalls provided should not be one or the other but both, especially in a facility like an airport where people who benefit from both will be passing through the facility every day.
4. There are features needed that are not in the standards. Examples: a place to adjust clothing or do necessary treatments or medical procedures in private and clean surroundings; verbal annunciators for information at selected points or multimodal information systems.
5. There are products available that are helpful and useful for all, and some that are not yet available but badly needed. Examples of available and useful products include interactive electronic information systems, computer controlled and used with audio; and faucets and hand dryers that are controlled by the mere presence of a hand. Examples of needed products: electric service carts capable of carrying

people who cannot climb aboard (no steps, elevated floors, or seats); visual paging and announcement systems. Only airport operators and designers can create a demand for these products.

Needed Research

It is the consensus of the authors that the application of new and emerging technologies and universal design principles is more important to airport accessibility than additional research at this time. In this vein, the following recommendations are made.

1. A careful study should be made of airport facilities built in the last ten years using modern accessibility standards. The evaluations should be made by multidisciplinary teams involving airport operators, designers, researchers, airline personnel, and people with disabilities who have extensive travel experience. The goal for this research is to

identify what works and what doesn't in providing accessibility to airports, to identify where the standards fall short and what solutions work best in providing services, and to identify what solutions work best at different types of airports.

2. Convene a structured, design-focused, consensus conference with the same cross-disciplinary group and universal designers. This group would use the information gathered from the above study along with other information. The goal would be to achieve agreement on the kinds and types of features and equipment that would improve airport use. The involvement of all user groups is essential to this effort.

NOTE:

1. A Disability, Functional Limitation, and Health Insurance Coverage: 1984/85, U.S. Department of Commerce, Bureau of the Census, 1986.

APPENDIX D PROVISIONS FOR DISABLED AND ELDERLY IN AIRPORT AUTOMATED PEOPLE MOVER SYSTEMS

David M. Casselman and Theodore C. Barker, Lea+Elliott, Inc.

INTRODUCTION

The purpose of this brief is to summarize the provisions typically made by Lea+Elliott, Inc., for disabled and elderly access in Automated People-Mover (APM) systems. Numerous provisions are made which strive to make use of the airport APM system a barrier-free experience for the disabled or elderly passenger. The following summarizes the major provisions that are made and generally describes the manner in which they are implemented.

FACILITIES PROVISIONS

Facilities provisions are accomplished through a process of APM system design and facilities interface. Typically, the APM system is procured through the use of a specification that defines the performance requirements

of the system. An APM supplier will then contract to provide the system, including vehicles, controls, and guideway equipment.

The station and boarding platform are implemented through the preparation of drawings and specifications. Station construction, however, is usually completed by the terminal building general contractor. Lea+Elliott, Inc., writes the APM system specifications and provides APM facilities design criteria to the terminal design team to ensure that the proper interface occurs between the APM system and the station facilities.

The following provisions are included in airport APM systems:

1. *Level Boarding.* The elevation of the station boarding platform is set to correspond to the floor level of the vehicle. The APM system specification allows a maximum deviation of 7/8 inch from the station platform elevation.