

# Pathways to Accessibility: Disability and the Physical Environment in Latin America and the Caribbean

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*This working paper is being published with the sole objective of contributing to the debate on a topic of importance to the region, and to elicit comments and suggestions from interested parties. This paper has not gone through the Department's peer review process or undergone consideration by the SDS Management Team. As such, it does not reflect the official position of the Inter-American Development Bank.*

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# Contents

Definition of Key Concepts

3

Summary

4

Making the Transition to Full Accessibility

5

Establishing Design Parameters

10

Urban Transportation for All

18

Technology and Society

22

Accessible Communications

24

Accessibility Strategies

28

Bibliography

41

# Definition of Key Concepts

- Accessibility.*** The capacity of an environment, object, or tool to be used by all persons as safely, comfortably, and independently as possible. “Safety” is implicit in the concept of accessibility. Reference to “all persons” is associated with the diversity of human characteristics and of situations, limitations, and conditions of every human being during his or her lifetime. “Accessibility of the environment” refers to specific physical conditions (e.g., fixed or mobile; tangible or intangible) of infrastructure and fixtures. “Accessibility of a route or site” means that individuals can enter, use, and exit it safely, comfortably, and as independently as possible. Accessibility is directly related to ergonomics (see also *Ergonomics*).
- Diversity.*** Antonym of physical equivalence of individuals and their circumstances (e.g., diversity of height, agility, mobility, sensory perception, or intellectual capacity). Diversity must be considered when developing design parameters.
- Ergonomics.*** Attempt to optimize the interaction of human beings, their physical environment, and its fixtures. Ergonomics discovers and applies information to achieve safety, comfort, and efficiency. An ergonomically accessible design contributes to the free exercise of citizens’ rights and duties; improves quality of life; facilitates the integration of many people into a country’s productive system; facilitates the psycho-affective, socioeconomic, and professional development of all individuals; prevents injuries and accidents; and reduces stress (see Box 5).
- Technical Standard.*** A document, arrived at by consensus and approved of by a recognized organization, that provides for a common, repetitive use of rules, directives, or characteristics for activities or their results in order to achieve an optimal level of order within a given context (see Box 1).
- Universal Design.*** Spaces and products designed to maximize use by all, without the need for special adaptations. It is important to consider complementary operational aspects to achieve effective results for interventions that are new to the environment and to preserve accessibility that has already been achieved. When a universal-design solution is not possible, incorporation of other specific designs must be considered (e.g., in cases of severe injury or complex disabilities that require specialized attention).

# Summary

Latin America and the Caribbean (LAC) has only recently begun the process of making the physical environment accessible to its population as a whole, including people with disabilities. Making the transition to full accessibility requires integrating the concept into all facets of society—from education and architecture to tourism and communications. To this end, the author offers a comprehensive overview of the key pathways to accessibility of the physical environment: infrastructure, transportation, technology, and communications.

Achieving full accessibility requires important shifts in education, including the integration of accessibility into formal academic training. Establishment of technical standards is also essential. Moreover, a socio-political commitment, based on adaptation of successful models, is key. Success stories demonstrate that effective solutions involve an awareness of the ability to change guidelines and a willingness to investigate options and take effective actions at every opportunity.

The study presents criteria, including key variables, for setting parameters for the design

and construction of accessible infrastructure. Also presented is an approach for approximating universal architectural solutions, based on defining minimal common features of large population groups and desired levels of accessibility. Major reference parameters are then used to translate these functional criteria into technical measures.

Special attention is given to the urban population and environment, including recommendations for designing and implementing projects. The study considers how to make public transportation accessible, including the role that ergonomics plays. Two types of technology and their relation to society are also discussed. Recommendations are offered for making a wide variety of communication products and services—from mobile phones to television sets and the Internet—accessible to those with particular types of disabilities.

Finally, the study suggests action strategies appropriate for the LAC region, including the development of an Accessibility Matrix Plan.

# Making the Transition to Full Accessibility

The United Nations Universal Declaration of Human Rights affirms the entitlement of all people, without any distinction whatsoever, to access public services and exercise their economic, social, and cultural rights. This affirmation is not limited to the central areas of large cities, but must extend to settlements; rural communities; and cultural, historic, and tourist sites.

## Appropriate Treatment of Persons with Disabilities

In the presence of those with disabilities, most people relate to what they imagine about them rather than who they really are. Ideas, transformed into emotion, create a distorted, fear-filled image of disability. The World Action Program for Persons with Disabilities proposes fostering effective means for the full participation of persons with disabilities in society. Specific recommendations to facilitate relationships are as follows (Annex 1):

- **Be natural.** Don't show too much or too little concern; relate in an age-appropriate way. Don't underestimate abilities or assume economic disadvantages. Be discreet if it is necessary to give assistance, and always ask if there is any need; however, never help without first suggesting it.
- **Show respect.** Don't make people with disabilities enter establishments via unacceptable routes, (e.g., kitchens or storage rooms). Don't patronize them (e.g., picking them up to save them from having to walk up stairs or shouting when they appear not to understand something).
- **Use common sense.** For example, sit down with a person in a wheelchair if you're going to talk for a period of time,

imagining that the person is just sitting down; don't shout at a person who is blind.

## Key Objectives

The transition to viewing the physical environment as the backdrop to an entire population—endowed with accessible spaces and fixtures that overcome human beings' dynamic physical conditions—will be accelerated when the following interrelated objectives are met:

- Integrating accessibility into academic training,
- Setting technical standards,
- Encouraging socio-political commitment, and
- Working synergistically.

## *Integrating Accessibility into Academic Training*

Graduate and post-graduate curricula should include accessibility, not only as a specialized field of training, but as a subject integrated into all fields, especially design. It should be updated in a broader academic field within the framework of change factors in practical scenarios resulting from unmet needs.

The concept was included in the final report of the XVI Latin American Conferences of Architecture Schools and Faculties (CLEFA) and the IX Network of Southern Cone Faculties of Architecture and Town Planning (ARQUISUR), which were held in 1995 and 1996, respectively, in Montevideo, Uruguay. During the transition phase, the Spanish Royal Board of Governors' Basic Course on Accessibility of the Physical Environment is an ideal tool. The first Latin American edition,

coordinated at the ISBA (Integración sin Barreras Arquitectónicas) workshop, has been implemented by the Uruguayan Institute of Technical Standards, Secretary of the Technical Committee for Accessibility Standards CT143 of the Pan American Standards Commission (COPANT).

### ***Setting Technical Standards***

Establishing technical standards, like moving toward group consensus, involves setting voluntary guidelines that are accessible and agreed upon by all interested parties and that aim to achieve a collective benefit. Technical standards are the result of a universal process applied by a recognized standardization body (Box 1).

Systematic application of a methods matrix that includes accessibility determinants in the comprehensive process of establishing technical standards, concurrent with considering specific infrastructure needs, will generate appropriate technical support for public and private terms of reference (bidding conditions, rules, ordinances, and regulations).

Thus, a technical standard can provide guidance (with international criteria) on the dimensions and technical characteristics of a specific mass-transit vehicle, as well as the informational pictograms and signs to be used, based on a standard or regulation responsive to local determinants, also making reference to and establishing routes and schedules (Annex 2).

### **Box 1. Concept of the Technical Standard**

According to the International Organization for Standardization (ISO),\* a technical standard is a document, arrived at by consensus and approved of by a recognized organization, that provides for a common repetitive use of rules, directives, or characteristics for activities or their results in order to achieve an optimal level of order within a given context. Technical standards should be based on results consolidated through science, technology, and experience and promote optimal community benefit.

Once a universal methodology is established, a recognized standardization organization sets the technical standard (by contrast, a technical specification is the sole responsibility of its author).

Accessibility of the physical environment involves considering various guidelines related to environmental characteristics; as well as dimensions, arrangement, safety, and operation of the elements to be incorporated (among other aspects and national circumstances).

These generate varying opinions and subtle differences in conclusions and, therefore, in technical specifications and legal provisions. In turn, this disparity leads to resistance in directly applying the technical specifications or legal provisions and in the generation and oversight of compliance.

Consistency, adaptation, and consensus are essential in order to avoid ambiguity resulting from minor differences or disagreements, which contribute to postponing effective policy decisions.

A technical standard, established by consensus emerging from participation of all interested persons or institutions, conveys (like the interpretation of a group consensus) the social acceptance of a legal instrument that refers to and fully represents it.

\* The ISO is the international body of the Pan American Standards Commission (COPANT), a regional organization with 28 national members; the ISO makes it possible to globalize guidelines.

### ***Encouraging Socio-political Commitment***

Implementing broad-based actions to promote accessibility will have an effective vehicle when political powers encourage legislation, regulation, control, and implementation of accessibility plans (the effective exercise of human rights as set forth by the Second Latin American Seminar on Accessibility of the Physical Environment [SIAMF]).

Along the way, promoting and disseminating sound institutional and private practices help toward consolidating a people-centered economic framework, supported by positive, multiplier effects through adaptation of models (Boxes 2 and 3). While accessibility leads to including the active participation of all persons (through productive employment, recreation, or leisure), it also aims to improve the quality of urban life for all, through agreed-upon market and social policies.

## **Box 2. Brazil's Experiment in Urban Accessibility: Rio Cidade**

Like other Latin American countries, Brazil has only recently begun the process of making the physical environment accessible to its population as a whole. One major step in this effort, the Rio Cidade Project, has transformed the urban face of Rio de Janeiro. Initiated in 1994, the Project's original focus was revitalizing public areas of the city, including establishing regulations governing their use and activities, and improving urban standards.

Under pressure from persons with disabilities, the city government and the Brazilian Institute of Architects realized that the general plan had failed to mention accessibility. Lacking prior experience in this issue, city officials called on the Independent Living Center of Rio de Janeiro (CVI/Rio), a nongovernmental organization, to determine how to incorporate accessibility into its plan.

During the first three-year phase, CVI/Rio oversaw accessibility projects and advised on their execution through weekly team meetings, daily visits to construction sites, and reporting to the town council. Planning was done with all users in mind, regardless of their physical abilities.

Solutions were sometimes universal in nature (e.g., ramps in traffic areas that service people with baby carriages, shopping carts, and freight transport, as well as those with mobility impairments). In other cases, special solutions were adopted (e.g., ground-surface differentiation code, using textures, to guide people with limited vision). An attempt was made to guarantee accessible routes along the entire 560 km<sup>2</sup> of repaved sidewalks. Requirements for ramps were implemented at all pedestrian thoroughfares, with appropriate sizes and locations. All urban fixtures were relocated outside the pedestrian traffic pattern and were re-sized to meet accessibility standards.

From the outset, the Project stressed importance of signals for people with impaired vision, making use of textures on the ground. This approach was based on successes in England and Spain and analysis of international accessibility standards and priorities specified by the Benjamin Constant Institute, Brazil's largest organization for the visually impaired. A two-texture code was proposed: 1) alert ground covering (placed in the vicinity of ramps and projecting objects) and 2) orientation strip (placed from the building line to ramps or in large, open spaces).

Despite initial resistance to adaptations, long periods of materials testing, and design experts' lack of training in accessibility, professionals have gradually come to understand the problems and have formed alliances for action. For the first time, they have confronted the issue of eliminating architectural barriers for the citizens of 14 urban districts. The results speak for themselves. Many people with physical limitations have moved to the redesigned areas, professionals from around the country now visit the Project, and plans are under way to revitalize 14 additional districts. In short, the Rio Cidade Project is a milestone in Brazil's accessibility process.

### **Box 3. Colombia's Museum for All To See**

In March 1999, the National Museum of Colombia opened the Museum for All To See, the first phase of a program on accessibility for the blind. In keeping with its educational mission of encouraging curiosity among its diverse citizenry about Colombia's rich cultural heritage, the Museum makes it possible for blind visitors to make direct contact with selected archeological and historical artworks.

At each of eight stations, a stand with a glass surface contains a reproduction or relief drawing of the object, along with a Braille description. A sensor-activated, audio handrail orally describes the object. For those objects connected with the early settlers and pre-Hispanic groups, the blind visitor can read Braille or regular text, receive auditory information, and touch a reproduction of the piece. For paintings, tactile drawings reproduced on the stand's surface in opaque glass allow the blind visitor to use his or her fingertips to compare and contrast two paintings by Simón Bolívar.

In addition, blind users can listen to excerpts from the *Rights of Man and the Citizen*, translated by Antonio Nariño, and "see" how the press on which the document was printed is constructed.

The Museum project has enjoyed the cooperation and support of organizations for the blind, who are trained to welcome and interact with vision-limited individuals and groups. Because of its interactive nature, the project has expanded to include the sighted—both adults and children. Their participation promotes the integration of visitors with limited vision into the Museum's regular clientele.

#### ***Working Synergistically***

Merely recognizing that past trends have not resulted in accessibility by all does not solve the problem. The pathway to full accessibility involves the effective construction of the

physical environment, for which both planned global actions and ongoing, individual actions are required. Effective solutions require an awareness of the ability to change guidelines, as well as a willingness to investigate the options and take effective actions at every opportunity.

# Establishing Design Parameters

Diverse criteria can be used to set parameters for the design and construction of accessible infrastructure. The following variables must be taken into account:

- Range of activities a person performs; difficulties faced in the process; and potential alternatives for planning, constructing, and changing the physical environment;
- Type of user; and
- Level of need or desired degree of accessibility of the physical environment.

## Components of the Activity Performed

From the standpoint of accessibility, all activities that a person performs have two components:

1. **Displacement**—Movement to the appropriate place for carrying out the activity; this implies being able to move freely through the environment without limitations or obstacles.
2. **Use**—Carrying out the action per se; this implies being able to use, enjoy, and reap a benefit from the surrounding physical environment.

Both components are essential. For example, it is useless if one can move freely about a spacious bathroom but cannot reach the sink from a sitting position in a wheelchair because an object below blocks access. Conversely, it is impossible to use a perfectly designed bathroom if the access door is too narrow, thereby preventing displacement.

Displacement can be horizontal (e.g., moving through aisles, corridors, or rooms) or vertical (e.g., going up or down stairs or ramps). Use consists of two phases: 1) preparation (situating oneself in order to connect with the object to be

used) and 2) execution (carrying out the desired activity).

## Difficulties of Displacement and Use

If a person has a limitation that differs from those that determine the needs of the population, s/he may experience difficulties of displacement: *maneuvering* (i.e., gaining access to spaces and moving about within them) or *changing levels* (i.e., overcoming differences in elevation). In terms of use of space, two types of difficulties may arise: *access* (i.e., limited ability to get to things and perceive sensations) or *control* (i.e., loss of ability to take action or execute precise movements with limbs).

Examples of problems that combine the above variables include the following:

- Horizontal displacement—Maneuvering in a straight line, changing direction, or getting through a door.
- Vertical displacement—Overcoming differences in elevation, whether disparities are continuous, abrupt, or large.
- Activity preparation—Manually reaching, seeing, or hearing.
- Activity execution—Control of balance or manipulation

## Alternatives

Guaranteeing displacement through a building or urban environment requires anticipating accessible routes that link spaces with each other and the exterior or their immediate environment. Such routes must fulfill four functional criteria:

1. Be flat or only slightly inclined.
2. Be as short as possible (to prevent those who have severe disabilities from

having to make long trips). Routes that cannot be made accessible should be so marked to avoid wasted trips.

3. Be free of obstacles (obstacles some distance from the ground can endanger the blind).
4. Have safe elements for support and guidance (e.g., non-slip flooring, handrails, or varying textures for the blind).

In most cases, it is neither easy nor economical to incorporate accessible routes into an existing building. For example, replacing stairs with a ramp, adding an elevator, and widening aisles are complicated operations justified only in older buildings to be renovated, not ones recently built. Thus, accessible routes should be included as a premise for 1) designing a building (in the case of new construction) and 2) selecting a site or building that allows for easy introduction (in the case of renovation).

Moreover, guaranteeing use of a building's many spaces and objects means considering a set of features that is difficult to specify and that changes over time, owing to the enormous diversity of activities that can be carried out and each person's unique characteristics. Nonetheless, these features must seek to achieve four basic, functional objectives for each specific activity:

1. A seated person should be able to carry out the activity. An object should be within reach of a wheelchair user, an elderly person who has difficulties, or a child.
2. It should be possible to perform the activity without moving around. Since most people with limitations use their upper limbs to help with displacement, it is difficult to carry out the activity and move around at the same time.

3. Functional use should not require fine motor coordination. Faucets, switches, door handles, and controls should be designed for use by those who have lost strength and dexterity in their hands.
4. Use of objects should be possible for people who lack either sight or hearing. It is necessary to devise ways for those with diminished capacities to receive information through use of other senses, usually hearing and touch for the blind and sight and touch for the deaf.

When designing and building, two basic factors must be considered:

1. Manufactured materials or construction solutions must be appropriately designed to guarantee that the largest possible number of people can use them.
2. Objects must be properly placed to ensure universal accessibility.

### ***Summing Up***

The above can be summarized as follows (Figure 1).

- *Planning.* What accessibility difficulties occur in carrying out daily activities?
- *Alternative.* How can the planning, building, and renovation of the existing environment address these difficulties?

**Figure 1. Summary of Variables in Overcoming Barriers to Accessibility**

<b>PLANNING</b>	<b>ALTERNATIVE</b>
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Activity		Difficulty		Specification	Functional Criteria	Affects
D I S P L A C E M E N T	Horizontal	⇒	Maneuver	Route ⇒	1. Flat or slightly inclined. 2. As short as possible. 3. Passageway free of obstacles. 4. Safe elements for support and guidance.	1. Building design  or  2. Site selection
	Vertical	⇒	Level Change			
U S E	Preparation	⇒	Reach	Feature ⇒	Activity can also be performed while seated, without moving around, without requiring fine motor skills, by those lacking sight or hearing	1. Choice of materials  or  2. Placement
	Execution	⇒	Control			

### Accessibility Population Groups

Diversity of individual limitations is a major difficulty in proposing architectural solutions accessible to everyone. A universally accessible environment would be the sum of environments accessible to each individual. Although nearly impossible to achieve, this universality can be approximated. A minimal number of common features define three large population groups with similar accessibility needs: those who 1) are ambulatory, 2) use wheelchairs, and 3) have sensory limitations.

#### *Those Who Are Ambulatory*

Those who are ambulatory execute certain movements with difficulty, with or without the aid of orthopedic appliances. Their displacement difficulties include 1) negotiating steep slopes, isolated differences in elevation, and stairs, owing to strength and balance problems; 2) negotiating narrow spaces,

covering long distances without resting; and 3) risking falls because of slips or trips of feet or canes. Their difficulties of use include 1) opening and closing doors, especially if they have closing mechanisms; 2) maintaining balance; 3) sitting down and standing up; and 4) activating mechanisms that require simultaneous use of both hands.

#### *Those Who Use Wheelchairs*

Those who must use wheelchairs in order to carry out activities, either independently or with the help of others, experience the following displacement difficulties: 1) inability to negotiate isolated differences in elevation, stairs, and steep slopes; 2) risk of overturning, particularly on stairs or crosspieces; and 3) need for wide spaces in which to turn or open doors. Their difficulties of use include 1) limited ability to reach objects, 2) limited field of vision, 3) hindrance of their own legs, and 4) incompatibility of wheelchair with furnishings.

### ***Those Who Have Sensory Limitations***

Those who have perception difficulties, owing to limited sensory abilities—principally sight and hearing—experience unique displacement difficulties. The visually impaired have the following displacement difficulties: 1) detecting obstacles (e.g., differences in elevation, prominent objects, or holes) and 2) determining directions and following routes. Their difficulties of use include 1) obtaining graphic information (e.g., written, images, and colors), and 2) locating multiple objects (e.g., panels of pushbuttons, handles, and controls). The hearing impaired have two major difficulties of use: 1) receiving information from acoustic signals and 2) relating to and engaging in exchanges with others.

### **Desired Level of Accessibility**

There are no absolute levels that ensure complete accessibility for all. Moreover, exceeding certain levels of need may be extremely costly or technologically complex. Therefore, three levels are established, with the understanding that a space, installation, or service is:

- Adapted, if it is in keeping with the functional and dimensional requirements that guarantee its independent, comfortable use by persons with limitations.
- Practicable, if it meets the functional and dimensional requirements that permit its independent use, under certain minimal conditions, by persons with limitations.
- Convertible, if it can be made at least practicable with minimal, low-cost changes that do not affect its essential configuration.

Although no specific standards determine when one of the three levels is applicable, the following criteria have evolved through practice:

- Adapted level—for activities carried out on public thoroughfares; for the construction of new public buildings.
- Practicable level—for work on existing public buildings when the adapted level cannot be achieved for reasons of cost, construction, or architectural or environmental protection; for the common elements of new multi-family, elevator buildings.
- Convertible level—for the common elements of new multi-family, non-elevator buildings; for the interior of new homes.

In order to implement functional alternatives to overcome accessibility problems in a public space or building, the functional criteria must be translated into technical measures. To this end, Annex 3 (Figures A3.1-4) presents the major reference parameters, in accordance with the four types of difficulties, three population groups, and three levels of need identified above.

### **Urban Considerations**

Application of the reference parameters to urban activities involves the following considerations:

- Effect of uncontrollable climatic variants;
- Greater effect of geographic variants;
- Displacements over greater distances;
- More interaction with other individuals and vehicles; and
- Operation of equipment and execution of work, maintenance, and repairs.

Rain, ice, and snow substantially change the conditions of a route or site. Pavement that is loose, slippery, or that contains grilles with large holes; and road construction or construction sites without appropriately fitted-out detours make displacement difficult and increase the risk of accidents. Unnoticed objects on routes or

prominent objects at low heights can harm individuals with impaired vision or those who are inattentive. Similarly, moving vehicles on pedestrian thoroughfares can surprise a person with impaired hearing and obstruct movement, thereby multiplying obstacles.

Vehicles and public transport in general, far from causing interference, should help facilitate the displacement of all persons, enabling them to cover distances or differences in elevation comfortably and within a reasonable period of time. If it is easy for all passengers to board and exit, safety is enhanced, risk of accidents is avoided, and the time each unit takes to complete its route is considerably decreased; transportation service for all is safer, more efficient, and comfortable.

Clear signage on walls, using pictograms and signs that are easy to see, of the appropriate size and with adequate contrast, helps the visually impaired or those who have difficulty understanding. The ability to confirm transportation units' routes by means of signs on the walls enhances the quality of the public service. These signs are part of an organized package of urban fixtures, including pedestrian thoroughfares and the grouping of components in lateral strips, ensuring displacement free of obstacles throughout their height and breadth, appropriate to traffic density.

Signposts and light posts, traffic lights, litter baskets, seats, newsstands, and telephone booths must comply with plans that take into consideration their accessibility, both on new urban routes and in the redesign of existing thoroughfares.

The width of ascending ramps that vehicles use to cross pedestrian thoroughfares or enter garages must be considered. Pedestrian traffic must receive priority. In these cases, the vehicle is entering the pedestrian traffic area and it

should not cause discontinuity. The routes will be continuous, forming an accessibility chain, allowing one to move from place to place without interruptions or discontinuities that impede displacement. Pedestrian crosswalks on vehicular roads with differences in elevation must have appropriate ramps with gentle slopes to ensure a smooth transition at all times.

Accessible crosswalks must be designed; however, it is also necessary to manage vehicular traffic through them to ensure true accessibility. A short-timed green light can make the infrastructure adaptation useless. Thus, along with the design, one must consider the management of fixtures, execution of construction work, maintenance, and repairs.

An infrastructure that encourages accessible tourism provides an opportunity for leisure activity to users with limited mobility or communication ability and their companions, as well as growth of tourism opportunities, particularly during the off-season (Box 4). Leisure or recreational areas should be able to accommodate all and be designed and operated in ways that ensure safe enjoyment.

Planned actions to make new urban infrastructure accessible have no significant effect on the investments required. It is appropriate to propose a qualitative change to projects and their management and to establish their integration into upcoming ones, maintenance of gains already achieved, and a gradual planned process of adaptation of the existing environment (Figure 2).

#### **Box 4. Tourism for All: Lessons from Europe**

In Europe, 11% of the total adult population can be officially classified as disabled. If one adds 2% of children under 15 who suffer a disability, 4.6 million women in late pregnancy, and the 14% of Europeans who are over age 65, the number of Europeans with limited mobility may easily exceed 50 million. Although statistics on the tourism potential of European citizens with disabilities are not conclusive, the accounting firm of Touche Ross has estimated that every trip taken by a person with a disability attracts 0.5 companions. The European tourism market includes some 36 million people with limited mobility who generate 630 million in overnight stays.

Although Europe lacks a specific tourism policy, it is considered essential that tourism services adapt to consumer demands, not the other way around. Within the framework of promoting tourism, the European Commission (EC) focuses on improving legal provisions to guarantee the unrestricted movement of people throughout the European Union, protect consumer rights, and facilitate the integration of people with special needs.

Senior citizens, who have considerable mobility difficulties, as well as varying degrees of hearing and vision loss, represent a growing potential for the European tourism industry. Over the past 20 years, the percentage of older Europeans who travel has increased from 7% to 40%.






























































































Spain's Senior Vacations program, initiated by IMSERSO (Instituto de Migraciones y Servicios Sociales), has played a decisive role in encouraging older adults to travel. The idea of promoting this partially state-funded vacation program for seniors was developed in 1985 to 1) achieve a higher quality of life for seniors and to 2) create and maintain employment in the tourism sector. Of the 6.7 billion pesetas invested in the program, 7.2 billion have been recovered through unemployment savings, as well as from individual, corporate, and social-security taxes. Moreover, the program has created 25,000 jobs. (Currently, the University Institute of European Studies is conducting a study on the benefits of accessible-tourism facilities; once completed, the study will make new statistical data available.)

In Portugal, senior citizens and persons with disabilities generate an estimated 70% of off-season hotel revenue. The town of Benidorm, Alicante alone attracts some 350,000 tourists over age 65 (150,000 Spanish and 200,000 foreign).

To capture a share of the growing international tourism market, which, according to the World Trade Organization, will exceed 1 billion by the year 2010, Latin America should develop its tourism potential and adapt it for citizens with limited mobility. To this end, architectural, urban development, and communication barriers must be eliminated. Providing accessible services and facilities to tourists with limited mobility will not only increase their enjoyment of tourism; it will also encourage competitiveness and quality in the tourism sector.

## URBAN SPACES AND ELEMENTS

## DIFFICULTIES

	URBAN SPACES AND ELEMENTS	DIFFICULTIES			
<b>BASIC</b>	Narrow thoroughfares and narrowings				
	Steep longitudinal or transversal slope				
	Inadequate, loose or slippery pavement				
	Imprecise boundaries, textured lanes				
	Grills with large holes				
	Low, prominent objects in thoroughfares				
	Unnoticed objects in thoroughfares				
<b>FIXTURE</b>	Pedestrian-vehicular crosswalks				
	Wooden and garden areas				
	Telephone booths and ATMs				
	Urban transport stops				
	Access to underground facilities				
	Newsstands				
	Signs				
	Traffic lights				
	Equipment boxes				
	Lighting				
	Pillars or bollards				
	Handrails				
	Seats				
	Garbage containers				
	Public toilets				
<b>FUTURE</b>	Road construction sites				
	Detours on customary routes				
	Vehicles parked in crosswalks				
	Vehicles in pedestrian thoroughfares				
	Informal comerse in thoroughfares				
	Garage or objects on pavement				
<b>SITES</b>	Public parks and plazas				
	Entertainment or sports centers				
	Historic and tourist sites				
<b>M</b>	Maintenance				
<b>T</b>	Public transportation				

## Project Design and Execution: Compatibility Criteria

Including accessibility in the urban environment and buildings is not limited to applying the specified reference parameters. Rather, it must be accomplished in a logical, coordinated manner within each project's design, execution, and maintenance process. Consequently, accessibility should not be an afterthought; rather, it should be treated as an additional requirement with which the space or element to be built or renovated should comply.

In order to satisfactorily incorporate accessibility, one must remember that accessibility should be compatible with the needs of all users, safety, funding, design, setting, and cultural heritage.

- **Needs of All Users**—Accessibility is best when it is not seen but is available to all; that is, it results from universal design. Specific solutions will only be used when a universal solution cannot be applied.

➤

- **Safety**—In addition to guaranteeing safe use of all elements in the environment, special attention must be paid to the specific devices installed to improve accessibility (e.g., bars or stair climbers) so that they are user safe and do not pose a danger to other users.
- **Funding**—In general, providing for funding in advance is not expensive; however, renovation is.
- **Design**—Accessibility should not be an afterthought; rather, it is an additional design premise.
- **Setting**—Accessibility should be achieved without damaging the quality of the environment.
- **Cultural Heritage**—Devices to enhance accessibility in historic areas should be formally appropriate to the environment, perceived as current additions, and totally reversible.

# Urban Transportation for All

In recent years, city governments across LAC have made exemplary improvements in giving all people access to public-transportation services, taking into consideration human beings' diverse physical, financial, and social characteristics. Today's complex urban fabric demands solutions that are responsive to the mobility and communication needs of diverse groups of people, many of whom must travel long distances to access the services distributed throughout their large and growing cities' physical structure.

## Public Transport System

The social and economic development of every urban center requires a public transport system that affords the individual and community an efficient, safe, and comfortable means of moving from place to place. Public transport should be humanized; that is, viewed in terms of social, as well as economic, profitability.

As a functioning system that provides mobility to urban residents, public transport consists of several interconnected elements:

- Infrastructure—Terminals, stations or stops, service areas, and rest areas.
- Rolling Stock—Railway, metro, streetcar, trolley, or bus.

- Interface—Specialized area of the sidewalk where the change from vehicular to pedestrian occurs.

From the standpoint of accessibility, supplementary measures that guarantee use of the service by as many people as possible, especially those with limited mobility or communication, are also important. In general, supplementary and operational measures are benefits instituted for a specific group that also service the entire community. Examples include routes, schedules, and special fares.

## Making Public Transport Accessible

Accessible transportation occurs when the highest possible number of people, regardless of their mobility or communication limitations, can independently use the urban, public-transport system. In LAC, various types of accessible transport solutions have been implemented. These include:



Integrated System,  
Curitiba



Trolley, Quito



Low Floor,  
Buenos Aires



Metro Line 5,  
Santiago

- The integrated transport system of Curitiba, Brazil combines high-platform buses and accessible stops, with traditional buses adapted with elevator platforms for users who are less independent, and one- or two-passenger vehicles or taxis that provide door-to-door service or with routes mapped out in accordance with users' needs, for those who require a specific solution for their mobility needs.
- The Quito trolley (Ecuador) and the Bogotá transmilenio system (Colombia) have systems with specialized highway corridors and unique roadways for accessible mass transit and specific stops. This is the first phase of a solution, whose second phase is operating the feeder routes for this initial system.
- Low-floor buses, used in Buenos Aires (Argentina) do not require adaptations to the urban environment and afford persons with limited mobility a high degree of independence.
- The metro as mass transport is being integrated into the accessible transportation system with adaptations to existing stations or by building accessible stations at the outset. Examples can be found in Chile

(Santiago), as well as in Argentina (Buenos Aires) and Brazil (Rio de Janeiro and São Paulo).

### **Role of Ergonomics**

Ergonomics is the science that seeks to apply knowledge about human beings' abilities and limitations to improving their interaction with products, systems, and the physical environment (Ergonomics Society 1999) (Box 5). In optimizing the interactions of urban residents with their cities' physical space and the rolling stock used to transport them, ergonomics plays an increasingly significant role. In this context, its three basic elements are the 1) human being (user of the urban transport system, with his/her abilities and limitations), 2) rolling stock (element that interacts with the user, enabling his or her mobility within the physical environment), and 3) interface (place where the person ceases to be a user of public space and becomes a user of the mode of transport).

Each of these three aspects is useful when planning a transportation system for all. Policies that encourage the development of transportation systems that persons with limited mobility or communication can use will, in turn, produce immediate economic benefits by integrating many potential users into the region's productive system and lead to new advances in technology.

## **Box 5. Ergonomics: Evolution and Accessible Design**

The concept of ergonomics is rooted in the Industrial Revolution of the late nineteenth and early twentieth centuries. At that time, Frank and Lillian Gilbreth conducted studies on performance and fatigue and the design of workstations and equipment for people with disabilities. Despite their contributions, the idea of adapting equipment and processes to people did not catch on.

Emphasis on adapting people to work remained until after World War II, when the Ergonomics Society (formerly the Ergonomics Research Society) was founded in England in 1949. Dedicated to adapting work to man, The Society first coined the term *ergonomics*, whose etymology consists of the Greek words *ergon* (meaning work) and *nomos* (meaning natural law or standard).

### ***Rapid Growth***

From 1960 to 1980, ergonomics grew rapidly, expanding into the automotive and computer industries. During the 1980s, the information technology industry brought the concept to the public's attention, and people became aware of ergonomic furniture, software, and office equipment and environments.

The following definitions parallel the concept's evolution from the 1960s through the early 1980s:

- Study of the human being in his work environment (Murrell 1965);
- Set of scientific knowledges relating to man and necessary for the design of tools, machines, and devices that can be used with maximum efficiency, safety, and comfort (Wisner 1973); and
- Attempt to relate the variables of design on the one hand and the criteria of functional efficiency or well-being for human beings on the other hand (McCormick 1981).

### ***Current Thinking***

Today, ergonomics is an interdisciplinary concept that combines knowledge from psychology, sociology, anthropology, medicine, physics, design, architecture, and engineering. Its goal is to optimize the interaction of human beings; physical space; and the objects, tools, and equipment involved in performing any activity in any environment. Sanders and McCormick (1993) present two major objectives for ergonomics. The first is to improve the effectiveness and efficiency of work and other activities, including convenience of use, error reduction, and increased productivity. The second is to enhance certain human values, including security, reduced fatigue and stress, increased comfort, greater acceptance by the user, increased satisfaction in performance, and improved quality of life.

### ***Planning and Design of Accessible Spaces***

To plan and design accessible spaces ergonomically, one must consider human characteristics (anatomical, physiological, and psychological); people's physical environment (e.g., noise, temperature, elevation, vibration, or illumination); and the fixture that will interact with the human being (e.g., chair, computer, or support bar). Next, one must evaluate and classify the ergonomic factors by considering human characteristics, capacities, and limitations (e.g., usability, maintenance, health and environmental impact) and ergonomic indices that enable one to quantify adaptations related to human beings (morphological, anthropometric, biomechanical, physiological, metabolic, sensory, cognitive, sociocultural, environmental, and energy-related). All of this is done within a specific context (including political, economic, sociocultural, technological, ecological, and geographic aspects).

From the standpoint of human beings and their interaction with the rolling stock, it is appropriate to consider how to meet the needs of specific user types through design. These include:

- Ticket dispensers or stop signals that are easy to read and interpret, that handle information well, are accessible to all users on alternate media.
- Appropriate relationship between the required physical effort and the movements involved in boarding the rolling stock (e.g., low-platform bus).
- Flexible rolling stock and fixtures that ensure safe use, regardless of user characteristics, such as systems of components to hold onto, areas large enough to allow a wheelchair or baby carriage to pass by, wide entry-and-exit doors (e.g., Quito trolley stations and vehicles and Bogota's transmilenio).
- Technology that maximizes the use of capacities and minimizes differences,

thereby facilitating greater independence and use (e.g., grab bars and handles at heights comfortable for all, tactile and audio indicators in passageways, and stop signals).

A key concept is that, in order for individuals to realize their true human potential, groups and societies require the freedom to control their physical environment. The recovery of vital space generates security; a sense of belonging; and the opportunity for integral, harmonious development.

In recent years, urban planners and designers have experienced the benefits of enabling this process to unfold under appropriate conditions. Each day, policies and administrative actions to improve public spaces and the means that facilitate their use are reflected in concrete actions. An accessible urban, public-transport system is a key condition for integrating everyone into this process.

# Technology and Society

Technology is part and parcel of today's world: it wakes people up, provides food, transports workers, and greatly enhances communication. Properly directed, technology can achieve greater social equilibrium and promote participation by all. Parallel to this technological development, special technologies are being designed to assist persons with specific disabilities. Increasingly, these rehabilitation technologies have evolved from the purely medical to more standardized products that are improving the quality of life for people with disabilities and the elderly.

Both types of technology should be encouraged to evolve, with a goal of reaching a greater diversity of users. Therefore, technology should be created for people at varying levels of mobility, dexterity, vision, and auditory function in order not to discriminate; that is, to approach design for all.

## Technology for All

Technology for all is the process of creating products, services, and systems that are flexible enough to be used directly, without support or modifications, by as many people as possible who have differing abilities and circumstances, covering the largest possible range of situations. It also involves the technologies' compatibility with the technical aids used by many people. Products and services should be designed to be accessible to the largest possible numbers of people, avoiding situations in which technological advances create new barriers.

If the needs of people with disabilities and the elderly are kept in mind when designing products for daily use, such as telephones and ATMs, then these products will be more easily used by many more people. Clearly, the added value of design for all generates obvious social and economic benefits since many more people can use the products throughout their lives.

## Rehabilitation Technology

Rehabilitation technology is any technology that can produce products and services for people with disabilities and/or the elderly in order to increase their personal independence and improve their quality of life. Since demographic studies forecast a progressive aging of the population, the expanding market for these technologies will result in social, economic, and industrial benefits for many who require technology for mobility, communication, self-care, and employment.

Extension of active, independent living produces important social and economic benefits. Moreover, industrialization of these technologies constitutes an emerging market with vast opportunities for future development, encompassing the production of such items as:

- Special footwear,
- Adapted vehicles,
- Wheelchairs and positioning systems,
- Adapted furniture,
- Computer-access devices,
- Tele-assistance,
- Perception of images for the blind,
- Alternative communication systems,
- Virtual reality,
- Guidance systems,
- Access to information in public places,
- Robotics,
- Sports aids, and
- Task-completion devices.

## Technical Aids

In 1999, the ISO defined a technical aid as any product, instrument, piece of equipment, or technical system used by a person with a disability, specifically manufactured or available on the market, created to prevent, compensate for, ameliorate, or neutralize the deficiency, disability, or handicap.

Technical aids are classified as follows:

- Therapy and training,
- Personal care and protection (including aids for incontinent patients, dressing and undressing, clothing, and shoes),
- Personal mobility,
- Domestic tasks (including eating and drinking aids),
- Furniture and other home and office adaptations,
- Communication, information, and signage (including reading and writing, telephone-call, and security-alarm aids),
- Products and merchandise handling, and
- Recreation (aids used with leisure activities, [such as games and sports], therapy, and training).

Since technical aids cover such a broad spectrum, professionals from a range of disciplines must participate in their design, development, prescription, and application.

When acquiring, prescribing, constructing, or marketing a technical aid, one should consider the following:

- Financial capacity,
- Compatibility,
- Repairs,
- Dependency on environmental factors,
- Durability,
- Ease of assembly,
- Ease of maintenance,
- Effectiveness,
- Flexibility,
- Ease of learning to use,
- Acceptability to the user,
- Physical safety,
- Portability,
- Security from theft, and
- Existence of spare parts.

In many cases, technical aids have helped people with severe disabilities, including limited mobility, to overcome them with a technical aid (e.g., motorized wheelchair), thereby regaining their independence. It is now up to city planners, architects, and those in industry and transportation to overcome their own limitations and include all citizens under equal conditions. All aspects must be brought to bear: technical, creative, industrial, social, and economic; above all, a collective, reflective effort must be made to understand the true dimensions of human beings.

# Accessible Communications

Accessibility of communications and information technology refers to the communicative and technical means, mechanisms, and alternatives that enable access to communication and information for all and especially for persons with sensory, cognitive, and/or physical limitations and the elderly (Annex 4).

Means of communication and information media are not only those whose purpose is personal and interpersonal communication; they also include those whose purpose is communication with the environment and surroundings (e.g., the mass media, including the press, radio, television, and the Internet). More specifically, telecommunications entails transmission of information between user-specified points, with no change in the form or content sent or received.

Telecommunications has become an essential tool for participating in nearly all aspects of society. Distance learning, telemedicine, telecommuting, and video-conferencing enable people to interact anywhere and at any time. Telecommunications technologies are critical for employment. Without their use by people with disabilities, many qualified individuals would not be able to work or achieve their maximum employment potential.

It has been recognized that, although human beings are increasingly dependent on telecommunications tools, people with disabilities remain unable to access many products and services that are vital for full participation in society. Many older adults say they could live alone if they had telecommunications equipment they could use. Limitations that exemplify less than full access include the inability to change an account balance using telecommunications services, not knowing whether a wireless telephone is turned on, and the inability to use a calling card because one cannot enter the numbers quickly enough.

## **Design for All: Recommended Actions**

Today, many people already benefit from new applications for telecommunications accessibility. For example, beepers with vibrators do not interrupt meetings, speaker phones leave one's hands free, and volume controls on public telephones allow one to talk in noisy places. Everyone benefits when people with disabilities become active in their communities and society as a whole.

Communication and information-access systems must be configured and planned to permit all users to send and receive information, regardless of degree of disability, age, or other limitations. In addition, access to these systems by people with disabilities should be as easy and involve the same amount of time and cost as for those without disabilities. People with disabilities and the elderly should be able to use a product, as shipped by the manufacturer, without having to modify it or acquire additional technologies.

Design for all seeks to ensure maximum flexibility and benefits and the maximum number of users for products. Accessibility is achieved more easily when it is considered during the design phase and during development. Early on and consistently thereafter, manufacturers and providers of telecommunications equipment and services should consider access by people with disabilities. When they conduct their regular tests, manufacturers should recognize that individuals with disabilities are part of a potential consumer market that they should consider like any other consumer group.

Information about a product, its accessibility, and compatibility should be made publicly available to people with disabilities in alternative formats (e.g., television advertising, printed ads in catalogs or product brochures,

Internet announcements, and other forms of publicity).

When a product cannot be adapted easily, it should be compatible with existing peripheral equipment or special equipment commonly used by individuals with disabilities so that the equipment can be made accessible.

Whenever possible, data entry, control, and mechanical functions should be completely operable through at least one mode, such that the components can be located, identified, and operated with precision by visually impaired users.

Also needed are teachers, both male and female, trained in sign language and Braille, sign-language interpretation, and serving as guides for the deaf-blind. Civil services must be encouraged to hire specialized personnel. It is also appropriate to staff public-contact locations with aids and mechanisms that facilitate communication, as well as special telephones in common-use areas.

Current advances in the telecommunications industry make it necessary for organizations that protect the rights of persons with disabilities to be prepared to disseminate information on telecommunications issues and to become involved in developing telecommunications programs for government and industry. In this way, the right to information, communication, culture, learning, leisure, and work will be exercised.

## **Product and Services Accessibility**

### ***Telephones***

Telephones are the most frequently used terminals; therefore, they must be easy for all to use. Elongated buttons with a degree of concavity help people press the correct key. For blind or partially sighted people, it is useful to be able to feel the telephone keys. It is particularly important to have a single raised dot on the number 5 key. A "send" key or timeout control prevents users who dial slowly from being cut off because of delay and assures them

that they have entered the correct number. An anti-slip base or easy-to-hold receiver can help considerably. Printing instructions using large type and high color contrast is essential for many people with impaired vision. For the hearing impaired, an additional receiver can help or can even be used by another person. Extra sockets make it possible to add such equipment as receivers and screens or to connect computers.

Regarding public telephones, it is important to reduce the level of ambient noise in urban environments. Therefore, a device to control volume is helpful to any type of user. Instructions for use should be legible and written clearly and concisely. For blind people or others who are visually impaired, placement of the keys, including function keys, should be in the standard order. Calling cards should be designed to make them easy to insert (e.g., with a groove on one end). In addition, the insertion points for cards or coins should be within reach for wheelchair users. Adding a folding seat and a utility shelf can help everyone.

### ***Mobile Phones***

While the Internet has opened new horizons in global communications and data transfer between fixed points, the mobile phone has removed these restrictions, making this power truly portable. Mobile phones have become a common accessory and can be critical for people who feel vulnerable when alone or away from home. The coming decade will witness more important changes once the Universal Mobile Telecommunications System (UMTS) can offer broadband capacity. In addition to certain attributes shared with fixed telephones, mobile phones are capable of connecting to computers and other assistant technologies through infrared ports; they are easy to hold, include a button that permits the function of every key, and menu contents can be read aloud to the user. Keys of reasonable size and variously-shaped function keys are also appropriate. The screen should have large characters and high contrast. The connection for receivers or assistant listening

devices makes it possible for many more people to use these phones.

### ***Public-access Terminals***

Entering, using, and exiting the system are design determinants. With the growing number of public terminals, such as ATMs, information systems, and points of ticket sale, it is important for these machines to be easily used by people with disabilities, the elderly, and foreign visitors.

Terminals should be positioned to avoid glare from the sun or artificial light. They should be installed at differing heights to accommodate tall people and people in wheelchairs. Beeps, clicks, or tactile responses to dialing should confirm for the user that the button has been activated. A place from which to hang a walking cane is also useful. The choice of typeface can significantly affect legibility. Smart cards that store information instructing the terminal to display larger letters, provide audible instructions, or utilize the user's preferred language, are advisable.

### ***Television***

The design issues discussed above also apply to the television set, keyboards, and size of controls. An appropriately designed screen image is required for people with impaired vision (e.g., impaired ability to distinguish certain combinations of colors, type size, or style). The user should be able to control the size of the characters.

With respect to the programs broadcast, it is important that the user have the option of activating subtitles. Teletext is an effective means of providing all types of information. The interactive television that permits online purchasing and banking is especially helpful to people with disabilities and the elderly, two key consumer groups. Remote controls should be easy to hold or to operate on flat surfaces.

### ***Smart Housing***

Telecommunications can play a fundamental role in enabling people with disabilities and the elderly to live as independently as possible through smart housing (the building of telematics into a home's electrical system).

Use of all elements of the system should be consistent and easy for everyone to understand. Personal alarm systems can provide notification to family members, friends, or emergency services. Telecommunication links can enable certain medical services to be provided directly to the home.

Smoke detectors can call for help. Functions that activate and deactivate lights after an established time or those that, when the user leaves the house, can advise verbally or visually about windows that have been left open or appliances that have been left on, are appropriate, as are rain detectors that advise that skylights have been left open and warnings to blind people that the curtains are open or closed.

### ***Information Technology***

Information technology offers people with disabilities new opportunities for interpersonal communication, access to remote services (e.g., telemedicine), the ability to conduct transactions from their homes (telepurchases), and new forms of participation (distance learning and telecommuting). Telecommuting (people performing work and submitting it to an organization from an off-site location), tele-education, telemedicine, and tele-cooperation projects are already being implemented.

The first barrier to information technology is design of the equipment, keyboard, mouse, monitor, and printer. In this respect, many of the observations made above are applicable. The design should ensure that the equipment is easy to use and operate. Insertion of discs, CD-ROMs, and sheets into printers are examples of the types of hardware issues that must be considered.

Once this barrier has been overcome, one can consider the difficulties posed by software, operating systems, and programs. Programs requiring less use of a keyboard are ideal for

people with limited manual dexterity. A clear, standard graphic should be used, and voice synthesizers that can read the text being generated on the screen should be considered. Greater bandwidth and a better processor, which make lip-reading and sign language possible, require at least 25 frames per second. Camera position and monitor size should also be considered.

### ***Internet: Web-page Design***

Because of the Internet's short history, accessible design has not yet become a priority issue. The Web-based Bobby program by CAST shows barriers to and compliance with existing accessibility guidelines and teaches website creators about accessibility.

The most frequent problem in web-page evaluation is not using alternative titles for image links and not including summaries that define the structure and purpose of the tables included. The most significant problem concerns frames. Like stairs in the physical environment, the more frames there are, the more difficulties encountered. When addressing

the general population, one should take care about including certain terms. Pages visited should have a text-only alternative. This simple measure would make the Internet administrator's resources accessible. While multicolored pages may be aesthetically interesting, they sometimes make it difficult to display items. The guidelines do not suggest that images be avoided to improve accessibility; however, they explain how providing a text equivalent of an image improves accessibility.

Textual content may be presented to the user as a synthesized voice, in Braille, or as visible text (for those with impaired vision). To be useful, the text or auditory description should have the same purpose or function as the image. All information transmitted by means of color should also be available without color. Combinations of background and foreground colors must have sufficient contrast to be seen by people with color-perception deficiencies or those viewing black-and-white screens. Many people with disabilities use special search engines, such as those that read text aloud, using voice synthesizers.

# Accessibility Strategies

Because the LAC region has no complete inventory of accessibility conditions, it would be of interest to systematically document and typologically analyze them to facilitate the drawing up of an Accessibility Matrix Plan. The Plan would work toward making the existing environment accessible so that everyone could use it freely and independently. It would assess the current level of accessibility and determine the actions needed to evaluate, prioritize, and adapt items. It would also propose a phased implementation plan for 1) public-use spaces (e.g., streets, plazas, and parks), 2) public buildings (e.g., cultural, administrative, health, and teaching fixtures), 3) elements in the transportation chain (e.g., stations, stops, and rolling stock), and 4) communications.

The Plan's specific objectives would be to:

- Achieve routes and opportunities to use spaces and elements, in accordance with applicable standards;
- Systematize existing problems in order to achieve solutions that are
  - Effective (correctly resolve problems),
  - Safe (for the user and others),
  - Integrative (encourage universal solutions),
  - Viable (are compatible with general features),
  - Lasting (solve problems permanently), and
  - Economical (avoid excessive expenditures);
- Maintain the level of accessibility that has been achieved to
  - Ensure the sound condition of the accessible elements and
  - Avoid subsequent actions that run counter to accessibility;
- Manage in accessible ways in order to

- Guarantee the accessible use of accessible elements,
  - Report on accessibility (e.g., signs or guides),
  - Correct deficiencies using technical or personal assistance,
  - Train personnel in accessibility, and
  - Plan emergency evacuation;
- Unify the planner's management criteria (in his or her role as a generator of actions) with those of the administrator (in order to plan for needs and resources in a controlled way throughout one or more administrations) and schedule actions
- According to degree of urgency or priority,
  - According to economic priorities, and
  - In coordination with other maintenance or alteration work.

## Training

Short-term training and retraining are needed for planning, design, and control professionals. Longer-term educational solutions require the gradual integration of accessibility into academic training. It is recommended that the first phase of this process be included in the university curricula for entering students and in professional training, supplemented by the research of recognized allies.

An appropriate methodology, supported by practical observations and applications—consistent with the contribution of suitable documentation—can achieve satisfactory, basic results.

To this can be added the multiplier effect in the emergent adaptation to professional practice. Examples include results of the multiple

applications of the Royal Board of Governors Course in Argentina, Brazil, Chile, Colombia, Costa Rica, Dominican Republic, Ecuador, El Salvador, Panama, Peru, Uruguay, and Venezuela.

The Course has been incorporated into the UNIT/COPANT training program (in 16- and 24-class-hour modules). The second edition of the text for the LAC region has enjoyed the support of the Organization of American States' Inter-American Children's Institute (OAS/IACI).

### **Advisory Assistance, Quality Control, and Inspection**

An appropriate source of advisory assistance, supported by related regional structures and based on programs that extend the results to quality control of the process and inspection of products, will help achieve sustainable results. Examples include the support for extension projects promoted by COPANT, currently in association with the Latin American branch of the International Commission for Technology and Accessibility for Latin America (ICTA LA).

### **Economic Arguments To Support Access**

Incorporation of accessibility parameters into the design, function, and construction determinants of new buildings, infrastructure projects, and fixtures does not increase cost if done

appropriately. Beyond the product cost, the economic equation—extended to the result of integrating significant sectors of individuals into productive or leisure activities—can generate positive outcomes.

This leads one to consider a solution of continuity that acts as a hinge for new actions, generating benefits for all without involving economic or social costs. The same applies when adapting existing structures in conjunction with global renovation or recycling actions.

Incorporation of accessibility conditions into the existing environment will obviously involve costs directly related to the type of action. Preliminary reflection on this aspect reaffirms what was stated earlier: Any investment that does not take accessibility into consideration will result in a future additional cost for adaptation or compensation—a cost that could have been avoided.

Investments in adapting the environment to make it more accessible should consider (in order to specify the cost/benefit ratio) the return generated by enabling part of the passive sector to become active and its consequent productivity, reduction of costs for social benefits and dysfunctions resulting from dependency, and capacity for reinvestment in cultural and leisure activities and accessible tourism. To this must be added the quality of the product, in terms of humanizing the environment.

## **Annex 1. Appropriate Responses to People with Specific Disabilities**

**Use of crutches**—Adjust your pace to theirs, avoid shoving, help if they have to transport objects or packages; don't separate them from their crutches

**Use of wheelchairs**—Position yourself in front of them at the same height (seated, if possible); ask how you can help if you don't know how to handle the wheelchair; speak to the person in the wheelchair, not to his or her companion.

**Speech impediment**—Try not to become nervous when they talk to you; understand that their rhythm and pronunciation differ from what you are accustomed to; if you do not understand what is asked, tell them so that they can ask in another way; don't pretend to understand when you really don't.

**Visual impairment**—Identify yourself when addressing them; if you point something out, make clear what and where it is located; if people need your help, offer your arm and walk slightly ahead; warn them of potential obstacles in their path; don't leave them alone without first letting them know

**Hearing impairment**—Speak to them when they look at you, not when their backs are turned; if you do not know sign language, speak slowly and clearly, with your face well illuminated; make sure they have understood what you are trying to say; if you encounter great difficulty, write down what you want to say.

**Limited understanding**—Behave naturally; respond to their questions, assuring them that you understand; treat them in an age-appropriate way (except in response to intellectual questions); limit help to what is needed, encouraging them to perform other activities independently; facilitate their relations with others.

**Behavioral differences**—Be discreet in your contact; avoid situations that can lead to violence, such as arguments or criticism; try to understand their situation, facilitating their participation in all activities.

**Other disabilities**—In response to those with less easily observable disabilities (e.g., allergic reactions to certain foods or exposure to sunlight, carpeting, or paint), ask them how they wish to be treated.

## **Annex 2. Summary of ISO and COPANT Accessibility Standards**

The Spanish Association for Standardization and Certification (AENOR) cites the works of the following ISO committees:

ISO/TC 173. Technical systems and aids for disabled or handicapped persons

ISO/TC 150. Implants for surgery

ISO/TC 168. Prosthetics and Orthotics

ISO/TC 172. Ophthalmic Optics

Other ISO technical committees whose work may be related include:

ISO/TC 8. Ships and marine technology

ISO/TC 20. Aircraft and space vehicles

ISO/TC 177. Caravans

ISO/TC 136. Furniture

ISO/TC 159. Ergonomics

In addition, the following ISO work should be cited:

ISO/TC 59. Building construction. Presented the 1981 "Needs of Persons with Disabilities in Buildings," revised as the 1982 "Design Guide;" and the ISO/TR 9527 "Technical Report on the Needs of Persons with Disabilities in Buildings" in 1994.

ISO/IEC. Currently developing a guide on dealing with the needs of the elderly and people with disabilities in connection with establishing standards. This benchmark work will demonstrate the benefits of adopting universal design principles. It will include definitions of relevant terms, a matrix of assistance to consider when developing standards, checklists, and resources.

### **COPANT/UNIT Technical Committee: CT 143**

In April 1992, the Executive Secretary of COPANT, at the request of UNIT, submitted for the consideration of all members the constitution of the COPANT Technical Committee for Establishing Standards Regarding Accessibility to the Physical Environment for Individuals. Thus, the COPANT Technical Committee CT 143 on Accessibility was established. It began operations August 21, 1992 in Montevideo, Uruguay. UNIT has served as Secretary since its inception. The objective of CT 143 is to develop technical accessibility standards, taking into consideration international precedents, particularly those related to the LAC region and other developing countries.

To date, 11 standards have been approved for graphic symbols, signage, flat traffic areas, ramps, pedestrian crosswalks, vehicular intersections, flat thoroughfares, stairs and elevators in buildings, curbs, handrails, and handgrips. Other standards are in the process of being revised or approved.

The current work program includes:

**Symbols and Signs** (COPANT standards 1614, 1616, and 1617)

**Urban and Rural Spaces**

***Access, alternative access***

***Thoroughfares***

- Flat surfaces (COPANT standard 1630, 1<sup>st</sup> rev.)

- Ramps (COPANT project 143:012)

- Stairs
- Pedestrian crosswalks at grade and pedestrian bridges (1631, 1<sup>st</sup> rev.)

### ***Parking***

- Mass transit vehicles
- Vehicles (COPANT project 143:015)

### ***Fixtures***

- Curbs, handrails, and handgrips
- Restrooms and drinking fountains.
- Telephones
- Mailboxes
- Waste baskets
- Benches and tables
- Ornaments
- Vegetation

## **Buildings**

### ***Access***

#### ***Thoroughfares***

- Flat surfaces (COPANT standard 1615, 1<sup>st</sup> rev.)
- Ramps (COPANT standard 1618, 1<sup>st</sup> rev.)
- Stairs (COPANT standard 1620, 1<sup>st</sup> rev.)
- Elevators (COPANT standard 1629, 1<sup>st</sup> rev.)

#### ***Parking***

#### ***Fixtures***

- Curbs, handrails, and handgrips (COPANT standard 1621, 1<sup>st</sup> rev.)
- Restrooms (COPANT/UNIT draft)
- Kitchens
- Electrical outlets
- Faucets (COPANT project 143:016)
- Iron fittings
- Furniture

## **Buildings, Urban and Rural Spaces**

### ***Signage*** (COPANT standard 1619, 1<sup>st</sup> rev.)

## **Transportation**

## **COPANT/UNIT CT 143 Extension Activities**

Pursuit of universal guidelines and goals has led the COPANT CT 143 to promote and participate in various extension activities, as follows:

*Seminar/Workshop on Accessible Transportation in Latin America*  
(held at UNIT, Montevideo, October 14, 1999)

*RP-CT 143, IDB Extension Workshop*  
(held in Bogota, November 1, 1999)

This workshop, part of the Royal Board of Governors VIII Latin American Seminar on Accessibility of the Physical Environment, gave rise to the:

*Roundtable on Accessibility*  
(organized by the IDB; held in Washington, D.C., July 6-7, 2000)

*Courses on Accessibility of the Physical Environment*  
(as part of the UNIT training program)

*Accessibility Inspection*  
(being implemented)

*Establishment of International Technical Standards*

CT 143 has proposed to ISO the inclusion of the graphic symbols for accessibility, deafness and difficulty in communicating, and blindness and low vision, in ISO standard 7001, considering as precedents those defined in COPANT standards 1614, 1616, and 1617.

In joint international action, it has proposed to AENOR the development of accessibility standards and creation of an appropriate area in the ISO for developing international standards for building and urban planning, with the participation of the Royal Board of Governors for Prevention and Attention to Persons with Disabilities.

This action has been implemented through creation of a sub-committee, ISO/TC 59SC16, whose mission is to develop international accessibility standards, including not only aspects related to building construction, but also those related to urban space and places of interest.

Broadly stated, this expanded objective—establishment of international technical standards on accessibility—will facilitate (as an interpretation of a universal consensus and guidelines) the social acceptance of a national or private legal instrument that refers to and fully represents it.

## **Annex 4. Proposed Guidelines for Basic Social Communication**

*XIII Latin American Seminar on Disability and Social Communication,*

*Madrid, November 1998*

*Demetrio Casado Pérez, Executive Secretary*

*Royal Board of Governors for Prevention and Attention to Persons with Disabilities*

It is impossible to establish general guidelines or standards for social communication since this effort would require addressing every type or class of mass communication in order to formulate appropriate proposals. Therefore, what I formulate here are proposed guidelines for the development of basic social communication:

- Coverage proportional to the importance of the problems and solutions;
  - Legitimacy of communication through general and special formats;
  - Presentation of both relevant capabilities and limitations;
  - Comprehensive, contextual approach;
  - Critical ability of professionals;
  - Safeguarding of individual and group dignity;
  - Preeminence of the person over the disability;
  - Not building social identities around the disability;
  - Attention to innovations relating to the disability;
  - Attention to solutions rather than their corporate backing;
  - Access of persons with disabilities to communication; and
  - Accessible basic communication.
1. Disability has a well-known social dimension, by virtue of which (outside the realm of benevolent social-marketing contracts or concessions) it is newsworthy. Clearly, the extent and intensity of coverage must be left to the good judgment of those who manage social-communication media and are in a position to weigh the interests of various matters. In any case, it is believed that disability-related matters are receiving increasingly more attention from the news media because of at least these two factors: a) increased prevalence of disability, as a result of improvements in public health, among other factors and b) progressive growth of potential actions to prevent or treat disabilities and their personal and social consequences.
  2. It is recommended that disability be presented in connection with the arenas in which it is produced and addressed (economic, political, health, employment) and, consequently, in the corresponding sections. That notwithstanding, producing specialized journals and programs is appropriate, as for any other important matter.
  3. On the assumption that the communication commitment to disability results in comprehensive, precise, and impartial representations thereof, it will be appropriate to show, insofar as they are newsworthy, both the limitations and the potential of persons with disabilities, as well as the solutions to their problems. This guideline allows basic communication to be independent of promotional communication, thereby preserving its credibility.

4. Comprehensive communication will not be limited to describing directly observable facts, but will show their contextual circumstances and causal factors. The point is to address the relationship between the disability and the social structures and processes in which it is produced and exists, as well as its corporate and institutional implications (delving beneath the surface requires taking multiple perspectives into account).
5. Basic communication should take precautions against the pressures brought to bear, not only by corrupt interference, but also by well-intentioned appeals to pity and commiseration. To this effect, apart from the correct personal attitude, it is appropriate for professionals to achieve a critical view of disability and its basic social, associative, institutional, and technical context.
6. It is inappropriate to expect or ask basic communication to place itself at the service of promoting the image of persons with disabilities; however, it is ethically acceptable to demand that special care be taken to avoid damaging the individual or group identity of the affected persons and to safeguard the dignity of the news products on disability. In particular, the image of individuals and groups as simple-minded, dehumanized, or other stereotypical adjectives should be avoided.
7. Such adjectives as “deficient,” “incapacitated,” “handicapped,” or “diminished” should be avoided, as should others with clearly inappropriate, negative meanings, such as “invalid.” It is less stigmatizing to use the expression “person with a disability” or an equivalent expression. It is most critical to safeguard the individuality of the person and the adjectival nature of the disability.
8. Except for groups or individuals who expressly associate their social identity with disability, it seems appropriate, in terms of preventing stigmatization, to avoid the tendency to present the impairment as the nucleus of the affected individuals’ social status, to the detriment of the attention that the deficiency, disability, or handicap, as well as actions for prevention, rehabilitation, equal opportunity, and maintenance assistance deserve in and of themselves.
9. Basic communication about deficiencies, disabilities, and handicaps should consider the changes and innovations that are always occurring. The corporate effect—whereby only established facts (the object of regular attention from the entities), not new information about the disability, are newsworthy—should be avoided. Examples of such changes include the following:
  - Increased number of at-risk children, as a result of improvements in obstetrical and neonatal care;
  - Generation of disabilities caused by contaminant products, especially in the work environment;
  - Disabilities resulting from violence;
  - Increased disabilities related to neurological diseases; and
  - Effects of disability on the elderly population.

10. The corporate and institutional effect should also be avoided in communicating about solutions. Specifically, the following should be avoided:

- Lack of news about self-management of solutions by the affected individuals, their families, and their informal support;
- News reports' opacity regarding the role of non-specialized entities;
- News reports' inattention to solutions adopted by peripheral groups that lack access to what institutions have to offer; and
- Deferring information-sharing about scientific and technical research on disability.

11. Basic communication should allow people with disabilities to express themselves.

12. Information should be offered in stylistic and physical ways that maximize accessibility.

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