



Image: Reynaldo Mondéz

# DESIGN FOR ALL:

## IMPLICATIONS FOR BANK OPERATIONS



Disability & Development, Social Protection & Labor, Human Development Network  
Social Development Department & Urban Development, Sustainable Development Network

The World Bank  
October 2008

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## **SUMMARY**

This work arose from a joint proposal from the social development and urban groups to a Challenge Fund established in 2006 to promote inter-disciplinary collaboration in the Sustainable Development Network. The objective was to explore issues of access, mobility and social inclusion, primarily in the urban environment. The work has been co-managed by the Social Development Department and the Disability and Development Team in the Social Protection Department of the Human Development Network.

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This paper has not undergone the full review accorded to official World Bank publications and the findings, interpretations, and conclusions expressed herein are those of the authors and do not necessarily reflect the views of the International Bank for Reconstruction and Development/The World Bank and its affiliated organizations, or those of the Executive Directors of The World Bank or the governments they represent.

**Key words:** Architecture, Disability, Environmental Design, Inclusive Development, Infrastructure, Urban Design, Urban Planning, Universal Design

**JEL Code:** J14 – Economics of the Elderly; Economics of the Handicapped

This Working Paper disseminates the findings of work-in-progress to encourage discussion and the exchange of ideas. The paper carries the names of the authors and should be cited accordingly.

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## ACRONYMS AND ABBREVIATIONS

|         |  |
|---------|--|
| ABA     | Architectural Barriers Act (1968)  |
| ADA     | Americans with Disabilities Act (1990)   |
| BMF     | Biwako Millennium Framework  |
| BRT     | Bus Rapid Transit  |
| CRPD    | UN Convention of Rights of People with Disabilities                            |
| CUD     | Center for Universal Design  |
| CVI-Rio | Independent Living Center of Rio de Janeiro                                    |
| D&D     | Disability and Development   |
| DFA     | Design for All   |
| DFID    | Department for International Development (UK)                                  |
| DPOs    | Disabled People's Organizations  |
| EFA     | Education for All  |
| EU      | European Union   |
| G3ict   | Global Initiative for Inclusive ICTs   |
| GAATES  | Global Alliance for Accessible Technologies and Environments                   |
| GAID    | Global Alliance for Information and Communication Technologies and Development |
| GPDD    | Global Partnership on Disability and Development                               |
| ICT     | Information and Communications Technologies                                    |
| IDB     | Inter-American Development Bank  |
| IEG     | Independent Evaluation Group   |
| ILO     | International Labour Organization  |
| MDGs    | Millennium Development Goals   |
| NGO     | Non-Governmental Organization  |
| RIT     | Integrated Transportation Network  |
| SIDA    | Swedish International Development Cooperation Agency                           |
| UD      | Universal Design   |
| UNDP    | United Nations Development Programme   |
| UNESCAP | United Nations Economic and Social Commission for Asia and the Pacific         |
| UNESCO  | United Nations Educational, Scientific and Cultural Organization               |
| USAID   | United States Agency for International Development                             |
| W3C     | World Wide Web Consortium  |
| WAI     | Web Accessibility Initiative   |

## EXECUTIVE SUMMARY

Universal design is defined as “the design of products and environments to be usable by all people, to the greatest extent possible, without need for adaptation or specialized design.” While the concept emerged primarily with regard to disability issues, universal design strives to be a broad-spectrum solution that helps everyone, including elderly people, people with strollers, pregnant women, and children, in addition to people with disabilities. Its goal is to remove physical barriers and create a more inclusive environment.

The purpose of this paper is to inform World Bank task team leaders about the benefits of universal design and to recommend ways in which universal design can be integrated as a component in projects of the World Bank. It presents the applications of universal design particularly in infrastructure with the focus on transport, urban development, water and sanitation, education, health, and ICT sectors, as well as post-conflict and natural disaster situations. Specific factors in projects such as procurement and evaluation criteria are not addressed in this context.

There are compelling reasons for the World Bank to adopt universal design. First, the UN Convention on Rights of Persons with Disabilities (CRPD), which came into force in May 2008, has provisions for universal design. Article 2 of the CRPD defines universal design and Article 9 urges State Parties to enhance accessibility in physical environments. The convention includes a high proportion of developing countries and is expected to increase demand for Bank support for its implementation and for ensuring accessibility on Bank financed projects.

Secondly, universal design is essential for inclusive development, a core component of the World Bank’s mission for poverty reduction and the achievement of Millennium Development Goals (MDGs). Inclusive development recognizes diversity and aims at involving everybody into the development process. Universal design accommodates physical and sensory diversity among people. It promotes social inclusion of particularly those who have been traditionally marginalized due to their functional limitations, by enhancing access to essential services and economic opportunities.

While the World Bank currently has no policy regarding design criteria for any of its projects, universal design could be adopted by the World Bank because it is the design concept which is most cost-effective, flexible, and inclusive. It is cost-effective because universal design requires additional costs of approximately one percent if incorporated from the outset of a project. On the other hand, not incorporating universal design can incur significant human and opportunity costs due to inaccessibility. Also, universal design is flexible and can be adopted in each local case, as it is not a standard which is definitive and specific. It is meant to be universally acceptable and usable by the population that will use the specific built environment or products, and thus it is dependent on the local culture. This also indicates the inclusive nature of universal design, in that the designing process should be participatory and consultative.

Key considerations in implementing universal design are:

- **Incorporate universal design from the outset** as an essential component of the project in order to minimize the additional cost. Adaptations of the existing built environment will cost far more.
- **Establish participatory mechanisms for universal design in a specific project.** Universal design is local-environment specific, and may not be transferred from one region or country to another. Seek input from local community users including people

with disabilities, women, and elders. Contact Disabled People's Organizations (DPOs) if any.

- **Educate designers, builders, and users about the purpose and benefit of universal design** so that they find good solutions to problems.
- **Include a universal design component into procurement.**
- **Identify macro level inter-sectoral relationships** to avoid deficient work. The project should take into account universal design in an integrated manner, which involves a wide range of sectors. Creating accessibility in an inaccessible space will not enhance total access.
- **Identify regional or country accessibility standards and anti-discrimination legislation.** While participation and consultation with local stakeholders is essential, projects should comply with local accessibility standards and anti-discrimination legislation whenever available.
- **Conform to a specific framework and sectoral requirements of the CRPD.**

## I. INTRODUCTION

1.01 Today, inclusive development is a critical agenda at the World Bank as well as in international development circles. Benefits of development have not equally reached everyone; lack of attention to diversity, and deliberate and structural social exclusion have contributed to create and foster marginalization of certain groups. There is no way that the Millennium Development Goals (MDGs) can be achieved without including these most vulnerable groups, and there is no sustainable development without inclusive development.<sup>1</sup> Inclusive and sustainable globalization is a core vision of the World Bank to overcome poverty, and to create individual opportunity and hope.<sup>2</sup>

1.02 Universal design supports this agenda by removing physical barriers – one of the major barriers to social inclusion. For those who have limited capacities such as people with disabilities, elderly, etc., public facilities and services are often physically inaccessible. Universal design developed through the recognition that a large part of the world’s population is not easily accommodated within the standard model upon which public spaces and buildings are based.<sup>3</sup> It aims at accommodating diversity of people’s capacities and needs, and thus improving people’s access to opportunities and promoting their participation in society.

1.03 Given the large amount of funds the World Bank provides for infrastructure, including transport, Information and Communication Technology (ICT), school buildings, water and sanitation facilities, etc., incorporating universal design into its projects will greatly enhance aid efficiency. By not focusing on universal design aspects, the World Bank loses the opportunity to include the maximum number of user groups in the project. It is cost-effective as well, in that the costs incurred constitute a small fraction of the total project when incorporated from the beginning of the project design. On the other hand, including universal design in the post-design process becomes a major cost factor.

1.04 Unlike national development agencies, there is no mandate for specific design approaches or concepts in Bank projects. Some national development agencies require specific accessibility standards. For instance, projects funded by the United States Agency for International Development (USAID) must follow architectural accessibility guidelines that are required by the Americans with Disabilities Act (ADA) and the Architectural Barriers Act (ABA) unless there are country standards for accessibility. There are sometimes conflicts between these requirements and the culture of the developing country where the project is funded. On the other hand, these requirements can bring about social change because including accessible design concepts can change ideas about disability and architecture.

1.05 Because most World Bank projects are funded by loans to developing countries, it has not been possible to impose stringent design standards on borrowers unless a country has established accessibility standards. Therefore, it is desirable to recommend a design approach or philosophy that will ensure that projects are usable for the maximum number of people and are designed in such a way as to be both socially acceptable and usable by population segments not previously considered. Universal design is a creative approach which can be interpreted narrowly or broadly. There are general principles that can be interpreted by the designer for a particular project. Universal design offers the designer the maximum amount of flexibility while protecting

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<sup>1</sup> McClain-Nhlapo (2006).

<sup>2</sup> Zoellick (2007).

<sup>3</sup> Alvarez and Camisão (2005).

the rights and responsibilities of designers to work on behalf of governments that may have specific requirements for projects.

1.06 The purpose of this paper is to inform World Bank task team leaders about the benefits of universal design and to recommend ways in which universal design can be integrated as a component in Bank projects. This paper presents examples of universal design as found in the various sectors including transport, urban development, water and sanitation, education, health, and ICT, and also in the post-conflict/natural disaster situations. Universal design concepts can be gradually implemented into project proposals as a way of making the project of use for all people. It is possible that specific sectors may or may not wish to be more or less prescriptive in implementing universal design. However, it is essential that the World Bank should take first steps to ensure that its projects are usable by all people including groups such as people with disabilities, elderly people, parents with children, and other groups not previously considered as an influence on design factors.

## **II. UNIVERSAL DESIGN – ISSUES AND DEFINITIONS**

### **A. What is universal design?**

2.01 Universal design is defined as follows: The design of products and environments to be usable by all people, to the greatest extent possible, without need for adaptation or specialized design.

2.02 Universal design is a concept, approach, or goal to make products and the built environment universally usable by all people everywhere. It accommodates the specific needs of the elderly, people with obesity, those who are very tall or very short including children, pregnant women, and people with various functional limitations, which tend to have been traditionally ignored.<sup>4</sup> <sup>5</sup>Universal design is dependent on the culture of the people who will be using the specific built environment. That is, universal design may be different in each and every country because it is meant to be universally usable in that place.

2.03 Universal design is not a standard, either national or international, but it may include design factors which might ordinarily adhere to national or international standards (see Box 1). Universal design may or may not include standards, but the design must be universally acceptable and usable by the population that will use the specific piece of the built environment. Universal design does not have hard and fast rules. It is whatever the designer intends for it to be, but it must follow some general principles.

2.04 Thus, universal design, by its very nature must be participatory. The participation of effected populations will determine the consensus that must drive universal design or universal

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<sup>4</sup> Albarez and Camisão (2005).

<sup>5</sup> There are several factors which pushed forward the emergence of universal design: the competitive, global nature of business, advancement of technology, the international disability movement, and rapidly growing aging and people with disabilities (Ostroff, 2001). It also reflects a paradigm shift from the segregated approach to one of integration, as seen in the shift of the disability model – from the medical model to the social or functional model. While the former focuses on the medical condition of a person, the latter conceptualizes disability as an interaction between individual limitations and the environment, focusing more on barriers created by society. (McClain-Nhlapo, 2006).

designing. As the concept of universal design has evolved, a number of general principles have emerged to guide the participatory process in reaching a universal designing consensus.

**Box 1: What Are the Differences between Universal Design, Visit-ability, and Accessibility Standards?**

Universal design is a design concept. Visit-ability is also a design concept. Visit-ability means the ability of a person, with or without disabilities or special needs, to temporarily visit a specific piece of the built environment such as a house or public building. In universal design, the design factors that make it universal are present throughout the house or building. In Visit-ability, only a portion of the house or building will be universally designed to be usable. For example, only one entrance, one floor and one toilet may be accessible and usable by visitors in wheelchairs.

Accessibility standards are stringent standards that have been mandated nationally or internationally for the construction of the built environment. The standards are quite definitive and specific. Violation of the standards by designers means that the built environment will not be designed in a prescribed accessible manner and may violate laws or regulations. Accessibility is not prescribed in universal design and therefore, universal design, however good or bad, cannot violate laws or regulations because it is an indefinite design concept.

**B. Principles of Universal Design**

2.05 The principles of universal design have been developed by a group of architects, product designers, engineers, and environmental design researchers at the Center for Universal Design (CUD) at North Carolina State University. These seven principles of universal design provide guidance in the range of design disciplines including environments, products, and communications in order to better integrate features that meet the needs of as many users as possible.

2.06 It should be noted that these principles address only universally usable design. Other considerations such as economic, engineering, cultural, gender, and environmental concerns need to be taken into account in their design processes.<sup>6</sup>

***Principle 1: Equitable Use***

----- The design is useful and marketable to people with diverse abilities.

Guidelines:

- 1a. Provide the same means of use for all users: identical whenever possible; equivalent when not.
- 1b. Avoid segregating or stigmatizing any users.
- 1c. Provisions for privacy, security, and safety should be equally available to all users.
- 1d. Make the design appealing to all users.

***Principle 2: Flexibility in Use***

----- The design accommodates a wide range of individual preferences and abilities.

Guidelines:

- 2a. Provide choice in methods of use.
- 2b. Accommodate right- or left-handed access and use.
- 2c. Facilitate the user's accuracy and precision.
- 2d. Provide adaptability to the user's pace.

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<sup>6</sup> Center for Universal Design (1997).

***Principle 3: Simple and Intuitive Use***

----- Use of the design is easy to understand, regardless of the user's experience, knowledge, language skills, or current concentration level.

Guidelines:

- 3a. Eliminate unnecessary complexity.
- 3b. Be consistent with user expectations and intuition.
- 3c. Accommodate a wide range of literacy and language skills.
- 3d. Arrange information consistent with its importance.
- 3e. Provide effective prompting and feedback during and after task completion.

***Principle 4: Perceptible Information***

----- The design communicates necessary information effectively to the user, regardless of ambient conditions or the user's sensory abilities.

Guidelines:

- 4a. Use different modes (pictorial, verbal, tactile) for redundant presentation of essential information.
- 4b. Provide adequate contrast between essential information and its surroundings.
- 4c. Maximize "legibility" of essential information.
- 4d. Differentiate elements in ways that can be described (i.e., make it easy to give instructions or directions).
  - e. Provide compatibility with a variety of techniques or devices used by people with sensory limitations.

***Principle 5: Tolerance for Error***

----- The design minimizes hazards and the adverse consequences of accidental or unintended actions.

Guidelines:

- 5a. Arrange elements to minimize hazards and errors: most used elements, most accessible; hazardous elements eliminated, isolated, or shielded.
- 5b. Provide warnings of hazards and errors.
- 5c. Provide fail safe features.
- 5d. Discourage unconscious action in tasks that require vigilance.

***Principle 6: Low Physical Effort***

----- The design can be used efficiently and comfortably and with a minimum of fatigue.

Guidelines:

- 6a. Allow user to maintain a neutral body position.
- 6b. Use reasonable operating forces.
- 6c. Minimize repetitive actions.
- 6d. Minimize sustained physical effort.

***Principle 7: Size and Space for Approach and Use***

----- Appropriate size and space is provided for approach, reach, manipulation, and use regardless of user's body size, posture, or mobility.

Guidelines:

- 7a. Provide a clear line of sight to important elements for any seated or standing user.
- 7b. Make reach to all components comfortable for any seated or standing user.
- 7c. Accommodate variations in hand and grip size.
- 7d. Provide adequate space for the use of assistive devices or personal assistance.

### **C. Who Is Affected by Universal Design?**

2.07 Universal design is a non-exclusive design concept. Everyone is affected by universal design and universal design affects everyone. As a design concept, universal design has a greater effect on specific groups of people who are concerned about the design of the built environment. For instance, wheelchair users, pregnant women, caregivers of the elderly, people with babies in strollers, and bicycle riders are concerned about curb cuts or sloping curbs. This synergy of diverse groups makes the design universal.

2.08 In the process of design, the participatory process needs to include a widely diverse group of effected users. For instance, participation in design might include the young, the elderly, people with disabilities, mothers, fathers, workers, travelers, or any group who will use the environment to be designed. Universal design includes participation, consultation, and opinions from a broad cross-section of the user population.

2.09 It is up to the universal designer to solicit participation and input. Failure to do so will inherently limit universal design. This participation or consultation is vital because of the cost of universal design and the time occurring between initial design and renovation.

2.10 This popular participation in universal design is not theoretical. There are no hard and fast guidelines for achieving participation or consultation. These are only limited to the imagination of the project design team. It is only certain that project designers must consult users before and during the design process.

2.11 Having said who is affected by universal design, it is important to say who is not affected by the universal designing processes --- those groups of people who will not use the piece of the built environment to be designed. For instance, if the World Bank is building a hospital in Asia or Africa, it is not important to seek participation or consultation from people in Latin America. You cannot transplant the universal design of specific facilities from one region of the world to another. To the casual observer, this process might seem self-evident, but some rudimentary guidance might be sought.

### **D. Cost of Universal Design**

2.12 Often, universal design is perceived to be costly; however, sometimes concerns about its cost are based on lack of knowledge and experience and inaccurate estimates of the actual cost of construction.<sup>7</sup> The assumption about costs of universal design often exaggerates the actual cost and disregards savings. This section discusses the cost of design, both with and without incorporating universal design.

#### **Cost of incorporating universal design**

2.13 The major cost incurred in incorporating universal design is the cost to retrofit various features to accommodate specific needs. When managed appropriately, however, this retrofitting cost can be minimized. Good practices of cost-effective universal design include the early incorporation of universal design and local stakeholder participation in it.

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<sup>7</sup> World Bank (2005b).

2.14 Research has shown that providing full access facilities from the outset has additional costs of approximately one percent. However, the cost of making adaptations after a building is completed is far greater; it can rise up to five percent or more of total cost depending on the modification of the architectural features of the building. For example, universal design is often considered to require much more space to accommodate wheelchairs. Two design research studies showed, however, that redesigning non-accessible buildings required no additional space, but just rearrangement of the existing plan.<sup>8</sup> These findings imply that universal design would not require many additions if introduced before drawing the blue prints of a building.

2.15 In addition to the early incorporation of universal design, local stakeholder participation in the designing process is a key to cost effective universal design. Appropriate universal design varies according to local conditions. Best practice in one region is not necessarily workable in another context. For example, in a country where wheelchairs are prevalent and braille or hearing aids are available, it is straightforward to design the building with ramps specifically graded for the wheelchairs, Braille signage, or induction loops for hearing aids. In a country where these are not readily available, the building would be designed differently because end-users would be less independent without wheelchairs or Braille or hearing aids.

2.16 The goal of universal design is to benefit the entire population, not just people with disabilities. Therefore, consultations with a variety of potential users (e.g. elders, caregivers with children, etc.) are crucial in order to maximize usability of Bank-funded facilities, as these people are the most knowledgeable about their own needs. In this process, it is helpful to educate designers, builders and citizens about the purpose and benefits of universal design for the whole community so that they understand its value and work to find good solutions to problems.<sup>9</sup>

2.17 Participation of local stakeholders is also critical for cost effective universal design because it helps identify locally available products and construction techniques. With resource restrictions, project designers are required to use local materials or techniques as much as possible to avoid significant cost impacts. This is also an important consideration to ensure that such facilities are maintained by local communities afterwards.

### **Cost of NOT incorporating universal design**

2.18 While cost of universal design could remain low with its incorporation from the outset and local participation, the cost of *not* incorporating universal design can be significant, taking into account human cost and opportunity cost incurred due to inaccessibility.

2.19 When buildings are inaccessible, the human cost of having people to provide assistance would be greater. When someone does not have easy access, the time and effort of other helping individuals will have to make up the difference of the lack of universal design, although the whole scale of this cost cannot be easily calculated.

2.20 Furthermore, cost of inaccessible infrastructure would be sharply increased by eliminating economic opportunity for a number of individuals. Physical barriers reduce the economic and social output of persons with disabilities and elders, and investments in the removal and prevention of architectural and design barriers are increasingly being justified on economic grounds.

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<sup>8</sup> World Bank (2005b).

<sup>9</sup> Ibid.

2.21 The cost of not incorporating universal design could be particularly significant for some types of countries: For example, **countries affected by conflicts or natural disasters** may have a high prevalence of impairments and disability.<sup>10</sup> Failing to incorporate these people into economic, social, political and cultural activities will guarantee a cycle of poverty for survivors and their families, and prevent vigorous economic and social development in the long run. Similarly, **aging societies**, increasingly prevalent in some middle income and many high-income countries, are facing the challenge of enhancing social and economic participation of large numbers of senior citizens. While elders might not consider themselves to have disabilities, many of them may experience a decrease in vision, hearing, physical abilities, and cognitive abilities. Creating physical barriers to their participation will increase the financial impact on social protection systems, decreasing their quality of life.

2.22 While the above mentioned cases concern the large portion of citizens with functional limitations, **countries that depend on a tourism economy** are likely to pay high opportunity costs for inaccessible infrastructure by excluding people with disabilities, elders, or even parents with small children who may otherwise visit these countries. Studies indicate that the tourism market for senior citizens and people with disabilities is potentially large. For instance, the percentage of older Europeans who travel has increased from seven to 40 percent in the past 20 years.<sup>11</sup> Evidence also shows that people with disabilities want to travel more frequently if facilities and services are more usable and accessible.<sup>12</sup> Barriers in public transportation, hotel accommodations, and other facilities will prevent countries from capturing a share of the growing international tourism market that will exceed one billion tourists by the year 2010.<sup>13</sup> It is estimated that by not adapting its inaccessible infrastructures the tourism industry fails to capture approximately 15- 20 percent of the global market share.<sup>14</sup>

### **III. UNIVERSAL DESIGN AND BANK OPERATIONS**

3.01 To the extent that the World Bank makes loans for the construction of schools, public buildings, streets paths and other public infrastructure, it has the opportunity to facilitate their universal design at a very low cost simply by encouraging universal design and providing information to its clients about the most cost-effective methods for its application. This section discusses how universal design concepts can be incorporated into each sector's work program; including transport, urban development, water and sanitation, education, health, and ICT, as well as into post-conflict, disaster recovery and reconstruction program.

#### **A. Sector-specific Universal Design**

##### **Transport**

3.02 Lack of universal design of transport services limits access for people with disabilities, the elderly, and many other groups to economic, social, political and cultural activities, and thus

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<sup>10</sup> 10% or more of the population in Sierra Leone and Iraq have become disabled by land mines and other forms of violence (NCD International Watch, 2006).

<sup>11</sup> Alvarez (n.d.)

<sup>12</sup> Darcy (1998).

<sup>13</sup> Alvarez (n.d.)

<sup>14</sup> Sakkas (2004).

perpetuates exclusion. It imposes barriers to employment, education, training, health or social services that would be otherwise available.

3.03 There has been progress in reducing barriers in the transport environment particularly in high-income countries, and many of the low and middle-income countries have also adopted accessibility policies. However, it is often a challenge to put these policies into practice due to lack of resources for implementation as well as the inadequate monitoring and enforcement of the policies. In most cases, applying Western standards and design concepts to deliver access solutions and ensure universal access in transport systems is not affordable or realistic for the provider or for the users in low-income countries as most of them are too poor to pay the costs of such standards.<sup>15</sup>

3.04 Thus, it is critical to adopt universal design depending on the level of existing development and local circumstances. For example, there are various interventions that can be done with relatively low cost, such as curb cuts insets at street corners, ramps to public buildings, and larger letters on bus destination signs.<sup>16</sup> These low cost improvements can bring disproportionate benefits not only to people with disabilities but also to all passengers. Table 1 provides examples of cost benefits of different interventions.<sup>17</sup>

**Table 1. Interventions for more accessible transport systems: Indicative priority**

| Marginal |              | Typical Intervention  | Probable priority  |
|----------|--------------|---|--|
| Cost     | Benefit      |   |  |
| None     | Mostly broad | Visual contrast, color coding, clear/intuitive signs, longer green signals  | Essential – these should be established design practice                                |
| Low      | broad        | Basic sidewalk and crossing design, hazard markings, minimize steps and other hazards                               | Very high – should be established design practice                                      |
| High     | broad        | Raised pedestrian crossings, raised boarding platforms or low-floor vehicles, general training of operational staff | High – should be considered practice for safe street environment, subject to resources |
| Low      | specific     | User awareness, priority seating, additional training of operational staff, tactile surfaces, curb cuts insets      | Very high – subject to policy for resource allocation                                  |
| High     | specific     | Elevators, illuminated and audible signals, wheelchair location, special transport services                         | High – subject to policy for resource allocation                                       |

Source: Roberts and Babinard (2005).

3.05 Interventions also vary depending on the typical mode of transportation. In some circumstances, there could be a special emphasis on developing universal design of non-motorized transport when such transport modes are in common use and bus service may be limited or unavailable. In other circumstances, universal design features of motorized transport

<sup>15</sup> Roberts and Babinard (2005).

<sup>16</sup> Rickert (1998).

<sup>17</sup> The interventions mentioned in Table 1 relate mainly to the urban environment where the demand for services is high and the marginal costs of improved design and special facilities tend to be low. In the rural context it is often very difficult to establish basic transport services to be sustainable because of the low population densities and limited economic activity. Inevitably, making these services accessible to all will be an even greater challenge in such rural areas (Roberts and Babinard, 2005).

should be focused due to the key role these systems may play in providing the majority of trips to all passengers.<sup>18</sup>

### *Designing Accessible Transport – Stakeholder Participation*

3.06 For adopting the most suitable, cost-effective local solution for incorporating universal design, participation of local stakeholders in the designing process is imperative. While every situation is different, here are some recommendations:<sup>19</sup>

- **Seek input from the community.** Consider organizing community meetings, structured focus groups, and/or universal design audits to gather information on barriers to transport. The inputs should be provided by different types of users including persons with different types of physical, sensory, and cognitive impairments, elderly, caregivers, etc., to identify their travel barriers and help prioritize access features.
- **Form an advisory committee** consisting of knowledgeable persons with different disabilities to review and assess plans for access to transport systems during the entire planning and implementation process. It will inform the transport officials and planners in order to prioritize actions, avoid costly mistakes, monitor results by testing universal design features, and reporting back on compliance with design and operating standards. Make sure that members of the committee include residents both from the neighborhood served by feeder routes and areas along trunk line corridors due to the different issues faced by users.
- **Build cooperative relationships among government agencies.** For universally designed transport, routes are important as much as vehicles. However, routes are very often under the control of different administrations. For a disabled person to enter a bus, the pavement is under control of the local authority, the road under control of the Ministry of Public Works and the bus under control of the Ministry of Transport. Encourage these officials to plan together to provide a universally designed travel chain between destinations and transit stops as well as on board vehicles. Or, a separate top-level unit can be set up in a Ministry to assume joint responsibility and exercise authority on all aspects of universal design.

3.07 In addition, the possible stakeholders include: representatives from disability organizations; transport providers; social service agencies (assist with key sites); center for universal design.

### *Universal Design Elements: Transport*

3.08 While universal design varies from one place to another, here are some elements to consider:

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<sup>18</sup> Meriläinen and Helaakoski (2001). Recent studies in developing countries show that the share of non-motorized transport varies between 25-50 % in major Asian cities while about 50 % of all trips in major African cities are made entirely by walking. In smaller and medium-sized cities, the share of walking can increase to 60-70 % and mainly dominates for shorter trips.

<sup>19</sup> These recommendations are based on Access Exchange International (2003); Rickert (2006).

## Road

- **Smoothness of moving on/off the road:** Does the road have a curb or entrance or exit point?
- **Grade:** What are the topographical features through which the road runs, and how does the road accommodate the steepness of the grade?
- **Surface:** What is the most acceptable surface for the road based on terrain, climate, and use? For instance, if the grade is steep, a rougher surface might be better for some users.
- **Separation of lanes:** When separate street lanes with dividers are created for pedestrians, bicyclists, and motorized vehicles, separate lanes for each mode are safer to use. This benefits everyone, but especially assists pedestrians with disabilities, or elders, and children.

## Bus Stops and Terminals<sup>20</sup>

- **Signs:** Bright and vandal-proof illumination, contrasting color schemes; large print letters; Station names easily visible from inside the buses; Clear and simple signs to easily identify different bus services.
- **Tactile strips:** on platform edge for the visually impaired.
- **Bench:** Include at least one on each platform.
- **Access to bus stops or terminals:** Raised crosswalks to reach bus stops; Avoid steps wherever possible; Where stairs are unavoidable, provide at least one ramp access; Wheelchair lifts only in exceptional situations; At least one turnstile per entrance must permit entry of wheelchairs, strollers, and bicycles.
- **Gap between station/platform edge and bus/train floor:** Escalated platforms, ramps.
- **Audible announcement of opening and closing the doors.**

### Box 2: Transport with universal design: Bus Rapid Transit in Latin America

Most of the examples of universal design in transport are found in Latin American cities. The subway systems of the largest Latin American cities have already incorporated universal design features in their newer stations in Buenos Aires, Rio de Janeiro, São Paulo, Mexico City, and Santiago. Also, universal design features making the Quito trolley and Bogotá's "Transmilenio" bus system accessible to persons with disabilities. More than a thousand low floor buses are in operation in Buenos Aires and smaller deployments are found elsewhere.

Curitiba in Brazil is often cited for its highly successful urban planning including its accessible transport system. The city's public transportation adopted Bus Rapid Transit (BRT) system, used by 85% of city's population of about two million. The raised platforms are used at each express bus stop, served by bridges attached to bus entrances that are lowered to span the gap between bus and platform. Platforms are accessed from the street via accessible ramps and handrails or, alternatively, by stairs along with elevators to ensure easy access to the physically disabled, senior citizens, pregnant women or baby carriages. The stops along these lines are totally a part of the Integrated Transportation Network (RIT), covering over 300 kilometers, which provides easy access to many people.

Source: Camisão (2001); Access Exchange International (2003).

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<sup>20</sup> Menckhoff (2007).

## Urban Development

3.09 Universal design is critical to urban development projects. Growth of urban centers occurs naturally as cities develop and grow. However, when a project is contemplated that will change the face of the city, universal design is both desirable and essential. People live in cities and the degree to which they can easily traverse and navigate the city may determine whether urban development is successful.

3.10 In reality, however, most urban environments remain inaccessible and dangerous to navigate. Heavy traffic, crowded streets with a number of obstacles, and open sewers and drains all threaten people's safety, particularly elders, people with disabilities, children, pregnant women, etc. Even in some cities which have been making progress in accessible environment, it is common to find incomplete projects or deficient work with poor quality designs, materials or finishing. Introducing universal design into urban planning can increase safety and comfort, reduce accidents, and consequently, lower health care costs and increased productivity.<sup>21</sup>

### *Universal Urban Designing*

3.11 Incorporating universal design in urban development is particularly challenging as it involves a number of elements and sectors. While the designing process certainly varies depending on the type and scale of a project, here are some key steps to consider:<sup>22</sup>

- **Analyze existing physical conditions** -- the sum of natural and urban elements, buildings, equipment (e.g. signage, public phones, traffic lights, lighting, garbage bins, benches), transportation (including conditions of roads and pavements), objects (e.g. trees, sewers) and services on site or being planned -- and obtain detailed measurements through fieldwork.
- **Analyze the functions of the site and the activities** which will take place there based on criteria of safety, equity, autonomy, and mobility for a broad range of users. **Seek input from various users** within the community, including people with disabilities, senior citizens, caregivers with strollers, women, etc. It would be helpful to discuss and collaborate with associations of people with disabilities or seniors on issues regarding diagnosis, design and implementation of the work. **Check local and country accessibility standards** if available. Based on initial design, **estimate and quantify any extra costs associated with universal design.**
- **Establish accessible routes** which ensure unhindered, barrier-free travel and integrated priority areas. In urban development projects, it is particularly important to consider universal design at the macro planning level. Effort for “universal design” is often made in vain due to “micro solutions” – such as an accessible road in front of a school for children with special needs in the middle of an inaccessible city, or an accessible washroom in inaccessible buildings.
- **Ensure that an intervention is well executed and compatible with other projects.** A small gap in a specific spot can ruin an entire, well-planned route – which can make investment useless. In addition, street furniture must be designed and placed in an

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<sup>21</sup> Albarez and Camisão (2005).

<sup>22</sup> These recommendations are based on Albarez and Camisão (2005).

integrated manner to make sure that all elements in the environment are compatible with each other. Curb ramps, for example, cannot be located in front of drains, trees, or any other obstacles. In case of a large project, designers with different expertise must communicate and share information at the very early stages of the project.

### *Universal Design Elements: Urban Development*

3.12 While universal design varies from one place to another, here are some elements to consider:<sup>23</sup>

#### Streets (also see 'Road' in transport section)

At least one accessible route needs to be available for all pedestrians in continuous fashion throughout. All routes which join main avenues, secondary roads, bus stops and other access points for public transportation should be considered. Other key elements include:

- Surfaces, evenness
- Width and longitudinal/transverse gradient: flat as possible while allowing adequate drainage or outflow of water
- Pedestrian crossings: ramps should be smooth, free of obstacles
- Object, elements which encroach on pedestrian areas: posts, holes, open drains, sewers, vendors, etc.
- Location and accessibility of street furniture: located along the same strip; outer edge of the pavement
- Visual and informative signage: clear and bright
- Availability of all-weather pavements and walkways
- Maintenance, condition of streets

#### Buildings

An accessible route from the main entrance, connecting to the main working areas, other public or common areas and washrooms need to be available.

- Width of doors and traffic areas
- Placement, access and height of equipment
- Washrooms: common areas, private stalls, family units
- Rescue and emergency areas and exit: easily identified and clearly marked
- Parking spaces: close to corners or entrances to places of major public interest

3.13 There are some cases when accessible routes cannot be assured due to sharp inclines, abrupt changes in levels or conditions, or very irregular street surfaces. Also, incorporating universal design may be especially challenging in traditional and older cities, where human movement is substantially hindered.<sup>24</sup> In these cases, incorporating assistive technical aids or means of transportation can be considered.

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<sup>23</sup> Albarez and Camisão (2005).

<sup>24</sup> Tappuni (2004).

### **Box 3: Making an Accessible City: The Cases from Brazil and Uruguay**

The “Rio Cidade Project” was the first urban revitalization project in Brazil that applied the principles of universal design in such extensive areas. The municipal government of Rio de Janeiro launched the project in 1994, incorporating the demand for accessibility issues put forward by the Independent Living Center of Rio de Janeiro (CVI-Rio), an NGO that had gained expertise in this field.

The main streets in 14 districts were initially chosen for reconstruction. A competition was held for architectural projects aimed at solving common neighborhood problems. This launched a rich experience of transforming a previously inaccessible city. During the project, CVI-Rio supervised the implementation of universal design through weekly meetings, daily visits to construction sites, and drafting reports to the City Government.

When the universal design process was launched in the Rio City Project, the goal was to focus on universal design with all users in mind, regardless of their physical abilities, based on estimates that over half of the population did not fit the standard stereotyped individual for which most infrastructures have been designed around the world. Based on this principle, universal solutions included ramps at crosswalks which serve all pedestrians, as well as more specialized solutions such as texture-coded footways to guide visually impaired road users. Street fixtures, such as lamp posts, sign posts, litter baskets, benches, etc., were repositioned and resized to meet requirements of universal design.

Rio Cidade Project had a limitation in that it was an adaptation of an existing city, not incorporating universal design into a city’s original architecture. Even so, the project has become a benchmark for universal design in Brazil, visited by professionals from other areas of the country. People with disabilities have begun moving to the city’s remodeled areas to live. However, no place that has been universally designed can be considered permanently accessible. External factors interfere constantly and must be monitored. The success of pro-universal design efforts thus depends directly on a commitment to maintenance, publicity, and monitoring.

Another example of urban development and universal design is the Program for Integration of Irregular Settlements in Uruguay funded by IDB. This neighborhood improvement project addressed the issue of universal design through the following components: (1) the widening of pavements; (2) the placing of curb ramps at strategic areas along pedestrian crossings; (3) the redesign of lighting systems along narrow pavements so that lamp-posts are not located at the center, which would obstruct pedestrian movement and make the use of wheelchairs impossible.

Source: Access Exchange International (2003); Alvarez and Camisão (2005).

## **Water and Sanitation**

3.14 Water and sanitation service systems are seldom planned to accommodate people who have functional limitations, although their livelihood and wellbeing, as with most other people, are linked to their access to and control over environmental resources for food, water, and shelter. Lack of access to water and sanitation systems often make people with disabilities dependent on others for their basic needs, and furthermore, more vulnerable to the risk of contracting diseases.

3.15 In many cases, latrines are not accessible by people with physical limitations. A community project to build latrines in Zambia, for example, did not benefit persons with disabilities as these latrines were not usable for them. They did not have a sitting pan and the doors were too narrow for a wheelchair to enter. The same toilets were used for bathing purposes. One woman with disabilities said that she bathed only at night and used the bushes as a toilet.<sup>25</sup>

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<sup>25</sup> Sachelo (2002).

3.16 A similar problem is reported in a Ugandan primary school. High door locks, limited space inside the latrine, taps which are too high make it difficult for children with wheelchairs to use the toilet. Children who crawl find the floor too dirty, especially as they often crawl with bare hands. Where the water source is not close by, users find it difficult to carry water to the latrine for washing. Or in other cases, toilets may be located some distance from classrooms without access ramps.<sup>26</sup> The United Nations Educational, Scientific and Cultural Organization (UNESCO) estimates that 90% of children with disabilities in developing countries do not attend school in part because of inaccessible toilets.<sup>27</sup>

3.17 In addition, steps to reach a water source, slippery floor surfaces and apron walls all impose barriers. In the household, narrow doorways, water storage containers without handles make it difficult for people with disabilities to access water. Barriers also exist in the natural environment, like long distances to water sources, rough terrain, rivers with soft or rocky banks and uneven slopes to reach the water. These all impede access for those with physical impairments, especially in rural areas.<sup>28</sup>

3.18 The World Bank-funded water and sanitation promotion project in the Western provinces of China is notable because it emphasizes accessible water and sanitation systems taking into account the needs and preferences of different sections of the community --- particularly women and other vulnerable groups such as people with disabilities or chronic illness, and elders. In constructing water systems, latrines, and other sanitation facilities, a community and households are involved in selecting the technical options of facilities appropriate to their needs. The project pays extra attention to the usability of facilities for people with disabilities and elders.<sup>29</sup>

#### *Universal Design Elements: Water and Sanitation*

3.19 While universal design varies from one place to another, here are some elements to consider:<sup>30</sup>

##### Water facilities

- Water sources should ideally be located near to households where people with disabilities live. This may mean providing piped water next to the house, or installing a storage jar nearby. A wide, level path may also need to be provided, leading to the facilities, so that someone using a wheelchair or walking with support can have access.
- Access to a tap or pump handle is particularly important. A long pump handle, a ramp or sitting block may need to be provided, to ensure access.
- A means of transporting water, such as jerry cans, should be adapted in such a way as to be convenient for the user.

##### Sanitation facilities

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<sup>26</sup> WELL (2006).

<sup>27</sup> UNDP (2006).

<sup>28</sup> WELL (2006).

<sup>29</sup> Sichuan and Shaanxi provinces Project Management Office (2007).

<sup>30</sup> These recommendations are based on WELL (2006) and Jones and Reed (2005). Jones and Reed (2005) provides a detailed guidance on universal design and water and sanitation facilities.

- Toilets should be constructed with appropriate access facilities. Examples include ramps to reach raised toilets, ways to allow people with disabilities to open, close and lock doors and non-slip floor surfaces.
- Installing raised toilet seats and handrails can provide support to people with disabilities and elders who are unable to use a squat latrine.

**Box 4: Access to Latrines, access to education: School latrine project in West Kenya**

Leonard Cheshire International, a charitable organization, is implementing a pilot project on inclusive education in Western Kenya. A key component of the project is environmental adaptation. Before the project, children with disabilities had difficulty accessing water and sanitation facilities, which were old and poorly maintained. The floors of the latrines were caving in, posing great risks to all children, while those with disabilities were totally unable to use them.

Through community participation, adaptations to school latrines have been made by pupils, teachers and the community. The latrines have been rebuilt and made accessible by providing concrete access ramps, wide entrances and toilet pedestals. The toilets are also equipped with supporting handrails or chains.

Together with other environmental adaptations, the project has helped to improve education for all of the children, while the school enrollment of children with disabilities has increased by 113 percent in three years.

Originally published from: WELL (2006).

3.20 Including universal design in agriculture projects is necessary because agricultural projects often include family groups as opposed to only healthy young men. When including women, children, elderly people, and anyone with a disability, the project must be designed in such a way as to permit all of them to participate and make a contribution to the success of the agricultural endeavor. For instance, in all agriculture projects there is a natural division of labor in family groups. The father, grandfather or brothers may do work which specifically requires strength. Women may assume those parts that require dexterity. Children, elderly people, and people with disabilities may assume those parts of the task relevant to their specific abilities or limitations.

3.21 Because this division of labor occurs naturally in agriculture, project planners should incorporate universal design concepts that complement it. This is particularly true in a multi-crop farming environment, where tasks are particularly diverse. Considerations in the design of agricultural buildings and the effective use of agricultural tools and equipment are particularly relevant. In the late 1980s, UNDP and ILO were experimenting with the use of light weight agricultural tools made of bamboo and hard plastic so that they can be used by women, children, or elderly people.

## Education

3.22 To accomplish the goal of Education for All (EFA), approximately 10 million classrooms will be built in developing countries by 2015.<sup>31</sup> Construction of school buildings represents 45 percent of the World Bank's education sector's lending portfolio,<sup>32</sup> which still accounts for the largest amount of Bank education funds. It is important that no child is denied access to education because of physically inaccessible school buildings.

<sup>31</sup> World Bank (2005b).

<sup>32</sup> Sipos (2006).

3.23 In general, universal design of schools will make them easier to maintain because the buildings will have fewer stairs, wider door openings, less obstacles to circulation and more durable walking surfaces. Improved lighting and elimination of hazards will lead to fewer accidents. When there are clear benefits for all users, controversies about cost will give way to creative problem solving and providing the best environment for learning possible.<sup>33</sup>

3.24 It is desirable that school buildings be usable for all members of the community since they can provide public space for various community activities. Since schools are probably the largest civic facility in rural villages, many community activities will take place in these buildings. Therefore, accessible school buildings are likely to increase participation in civic life for all people throughout the life cycle. This participation may reinforce the value of school attendance and help to ensure that facilities keep their children in classes.<sup>34</sup> Furthermore, in case of emergency, school buildings are often used as temporary shelters. Not making them accessible may exclude people with disabilities and others with limited mobility.

#### *Designing Accessible School Facilities*

3.25 While universal design varies from one place to another, here are some elements to consider:<sup>35</sup>

##### Design factors:

- Use topography to an advantage. Steeper ground often makes it easier to provide access, not harder. Paths oriented parallel to the slope of land are easier to make accessible than those that run perpendicular to the slope.
- Avoid level changes inside the building. This removes the need for ramps entirely. If abrupt level changes are kept below 15 centimeters, railings are not needed on ramps.
- Eliminate raised thresholds and steps at doorways. Thresholds are often used to bridge the gap between different floor surface materials on each side of a wall. When needed, thresholds should be recessed or kept low with a gradual transition from exterior floor surface to interior floor surface. This will eliminate the need for ramps and separate accessible entrances to classrooms.
- Avoid the use of elevators and lifts. They are the most costly items to build and may be very hard to obtain, causing significant construction delays. They also create significant maintenance costs and may take a long time to repair.
- Where no site is available that is large enough for a one-story school building, plan the school using a split level design so that ramps can be used to connect levels. On steep sites, an accessible entry can be provided to each level connected by an accessible path of travel outside. In climates with extensive rainy seasons, it may be possible to shelter the paths with overhanging roofs or galleries.
- Provide increased space for wheelchair access without increasing the overall size of the building by careful design and efficient use of space everywhere.
- Run ramps in the direction of travel so that everyone will use them and stairs can be eliminated.

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<sup>33</sup> World Bank (2005b).

<sup>34</sup> Ibid.

<sup>35</sup> These recommendations are originally published from World Bank (2005b).

Construction factors:

- Avoid specialty products. Find locally available alternatives when costs are prohibitive. For example, make grab bars from steel bars, pipes or wood if it is cheaper.
- Be creative in the use of available materials and products. For example, if wide doors are not available, use double doors made from two narrow doors. Paved surfaces, although desirable, are not absolutely necessary for wheelchair access if walking materials are durable, even, stable and well drained.
- Educate builders about new practices before construction begins to avoid creating problems in the field and institute quality control procedures to ensure things are being built properly. Rebuilding projects that are already under construction increases the cost of accessibility significantly.

Social factors:

- Invest resources in education and outreach during design to engage local builders and product suppliers in identifying how to accomplish the goals of accessibility. This will reduce lack of cooperation and reduce the need for quality control when construction commences.
- Use culturally appropriate means to provide access. For example, trying to save money by building one unisex accessible latrine instead of making the regular boy's and girl's toilet facilities accessible may be unacceptable in a culture that maintains strict separation between the sexes.

**Box 5: Accessible school construction project in Cambodia**

Cambodia Education Sector Support Project (CESSP), approved in 2005, aims at expanding access to educational services in Cambodia by addressing supply, demand, quality and efficiency constraints, especially focusing on the poorest and groups at risk. One of the project components is expanding school facilities, constructing lower secondary schools in communes without them, as well as completing incomplete primary schools. This also includes the construction of latrines and wells.

The school designs were modified at the start of CESSP to incorporate features with improved access for people with disabilities. A ramp was added to the side of the school building, which required no additional cost. Ramps were also added to the front of the latrine, and one of the rooms was changed into a sit down toilet, with an extra wide door for a wheelchair. This modification of latrine costs about twice as much as that of the old designs.

As a result, a substantial number of schools in the target areas have been made accessible. At the same time, not all schools could have that type of modification since some (approx. three percent of schools in Cambodia) are elevated two to three meters above ground level due to floods, making it difficult to attach ramps.

Design features were first drawn up on the basis of the documents on access for people with disabilities to schools, and standard architectural reference materials. The design drawings were shared with UNICEF, International NGO's working in school construction in Cambodia, the World Bank's Water and Sanitation Program, and a Special Education Needs Advisor from the Disability Action Council, and their ideas and input have influenced the final design.

Source: CESSP Project Document; Personal communication with Garvan O'Keeffe (2008).

## Health

3.26 Because health-care is universally necessary for all people, the universal design of health-care facilities is also important. In a developing country, there are certainly people who are much more dependent on health-care than others. These include people with disabilities, (either temporary or permanent) elderly people, mothers with children, and anyone who has a medical condition, disease, or injury which requires treatment once or many times.

3.27 Therefore, universal design when applied to health-care is both necessary and essential. In this area, participation by the user community and health care professionals, as well as specific consultation with targeted user groups is appropriate in project design. This participation will provide input to designers, builders, and equipment suppliers to accommodate the full range of human needs and abilities. It is particularly important to involve people with a variety of disabilities and local disability organizations in assessing universal design.

3.28 In addition to consultations, project planners should check local and national building codes as well as anti-discrimination laws if available. While universal design varies from one place to another, here are some elements to consider:<sup>36</sup>

- Health-care facilities should be optimally built at ground level, but when this is not possible because of local terrain and weather, at least one entrance ramp and level internal design is a minimum prerequisite for treating patients.
- In the reception area, counter service windows or receptionist stations should be located at a lower level with knee space. Chairs can be placed for use by people who cannot stand while transacting business. There should be enough open space left in the waiting areas for wheelchair users, luggage, etc.
- Doors should be sufficiently wide for wheelchair users and people who assist patients.
- Directional signage for the reception desk, bathrooms, doctor's offices should be visible and easily understood (pictographs will help those who are illiterate).
- There should be accessible, spacious toilets and dressing rooms available.

3.29 The Cambodia health sector support program, funded by the World Bank, included the construction of health centers and referral hospitals. It was necessary to persuade the borrower that health-care facilities should be accessible by people with disabilities. After a long discussion, it was agreed that all new health facilities would be built with access ramps of the maximum gradient of 5 degrees, equipped with handrails, and with double door entry. Fortunately, the project was still in its primary design stage and universal design was still possible. Other universal design features include clear signs including labeling of all doors in Khmer and English in all clinical and support rooms.<sup>37</sup>

3.30 In September, 2006, at a meeting of the African Decade for People with Disabilities in Addis Ababa, Ethiopia, representatives of the Swedish International Development Agency (SIDA) presented a paper on their HIV-AIDS prevention project in Southern Africa. In the Paper, universal design factors of the project were highlighted. For instance, all written material distributed or used in the project was also available in alternative formats such as Braille, large-

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<sup>36</sup> These recommendations are based on NCODH and Center for Universal Design (n.d.).

<sup>37</sup> Cambodia Ministry of Health (2003); Beng (2008).

print, recorded form, multiple languages, and included pictographs for those unable to read. This is a good example of programmatic universal design.

## **Information and Communication Technologies**

3.31 The importance of ICT in achieving development goals is widely shared as articulated in the UN Summit in 2005. The Global Alliance for Information and Communication Technologies and Development (GAID), an initiative approved by the United Nations Secretary-General, was launched after worldwide consultations. The Alliance seeks to contribute to mainstreaming of the global ICT agenda into the broader development agenda and raising awareness of policy makers.

3.32 However, as the digital domain expands, ICT could become a main dividing line between individuals, as well as nations, creating an information gap. Lessons from developing countries show that social inclusion, equal opportunities, and mainstreaming are keys to maximizing the gradual incorporation of ICT in developing countries.<sup>38</sup> ICT strategy should take into consideration usability for all to maximize the impact.

3.33 Universal design of ICT seeks to ensure maximum flexibility and benefits to the maximum number of users of products. In case of ICT, however, designing for the “broader average” may not always accommodate the needs of people with severe disabilities or very particular user requirements. Therefore, accessible ICT can also be achieved by designing products compatible with the technical aids used by many people. This will often benefit people without disabilities as well (see Box 6). Products and services should be designed to be accessible to the largest possible number of people, avoiding situations in which technological advances create new barriers.<sup>39</sup>

3.34 There are several international consortia promoting accessible ICT. For example, the Global Initiative for Inclusive ICTs (G3ict) is one of the flagship advocacy initiatives of GAID. G3ict was formed to facilitate a multi-stakeholder dialogue on ICT accessibility issues and develop a knowledge base and best practices sharing platforms in matters of accessible and assistive ICT. The World Wide Web Consortium (W3C) is another international consortium with the aim of leading the World Wide Web to its full potential by developing protocols and guidelines.

### *Information: Accessible Internet*

3.35 Currently, most Web sites and Web software have accessibility barriers that make it difficult or impossible for many people to use, particularly, people with disabilities. For example, when web developers require mouse interaction to use a Web site, people who cannot use a mouse can have great difficulty; and when developers do not include alternative text for important images, people who are blind cannot get the information from the images.<sup>40</sup>

3.36 Web Access Initiative (WAI), a special working group under the W3C, develops guidelines widely regarded as the international standard for web accessibility. For example, the guidelines recommend that:

- Provide text equivalents of non-text content (images, pre-recorded audio, video)

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<sup>38</sup> Sandu, Saarnio and Wilman (2001).

<sup>39</sup> Alvarez (n.d.)

<sup>40</sup> WAI..

- Create sufficient color contrast between text and background
- Ensure that pages are accessible even when newer technologies are not supported or are turned off
- Ensure that moving, blinking, scrolling, or auto-updating objects or pages may be paused or stopped.
- Use clear and consistent design and navigation
- Use the features that enable interactions through preferred input devices – mouse, keyboard, voice, head wand, or others.

3.37 While WAI guidelines primarily concern people with disabilities, they provide benefits to a wider range of people. This universal web design is particularly beneficial to the internet users in low-income countries, where literacy rates are often low, and the internet environment is limited (Box 6).

**Box 6: Accessible Web and its benefits for people without disabilities**

The application of WAI standards would also offer multiple benefits to various other groups in addition to people with disabilities.

**Older people:** While older people often experience changes in vision, hearing, dexterity, and memory as they age, they might not consider themselves to have disabilities. Yet the accessibility provisions that make the Web accessible also benefit older people with diminishing abilities. For example, many people with age-related visual deterioration can benefit from sufficient contrast between foreground and background colors, changeable text size, etc. Some older people with difficulty using the mouse benefit from device independence that lets them use the keyboard, rather than having to use the mouse, for all Web site interaction.

**People with low literacy and people not fluent in the language:** Accessible websites can benefit people with low literacy levels and people who are not fluent in the language of the website. Specifically, many of the aspects of web accessibility for people with cognitive disabilities help people who do not know the language well. In addition, accessible sites can be read by screen readers, so people who can understand the spoken language but cannot read can listen to websites.

**People with low-bandwidth connections to the Internet and those using older technologies:** Some aspects of web accessibility benefit people with low-bandwidth connections. Low bandwidth can be due to connection technology (e.g. mobile phone or personal data assistant), location (e.g. rural), or financial situations (a high-speed connection is unaffordable). Some older technologies load pages very slowly and do not support features used on newer sites. These issues are common in some developing countries and areas of developed countries. For example, people with low-bandwidth and old technologies can benefit from redundant coding of information and sufficient contrast between text and background colors for people who have black-and-white displays. Also, text description of images will be helpful for people who turn off images to speed up download and for devices/software that do not display images.

Source: Thatcher et al. (2006).

## *Telecommunications*

3.38 Telephones are the most frequently used device; therefore, they must be easy for all to use. To improve their usability, three key factors can be considered: visibility, audibility, and ease of operation.<sup>41</sup>

- **Visibility:** font size, font type, printing contrast  
Larger fonts and high color contrast is essential for many people with impaired vision. Instructions for use should be legible and written clearly and concisely.
- **Audibility:** sound clarity, sound volume  
For hearing impaired people, an additional receiver can help or can even be used by another person. In the case of public telephones, a device to control volume is helpful to any type of user in order to reduce the level of ambient noise in urban environments.
- **Ease of operation:** button size, button position, configuration process  
Larger buttons will help people press the correct key. For blind or partially sighted people, it is useful to be able to feel the telephone keys, and thus it is very important to have a single raised dot on the number five key. Placement of the keys, including function keys, should also be in the standard order. 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, easy-to-hold receiver or shoulder rest can help considerably.<sup>42</sup>

3.39 In addition to the universal design features of the products, phones should be located at a lower level. For instance, 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.<sup>43</sup>

3.40 Along with public telephones, mobile phones have become an important communication tool for many people. In the international development field, they increasingly draw attention as an innovative tool for creating opportunities in remote areas as seen in the GrameenPhone project, which empowered women in rural Bangladesh. In order to reach out to people in need, mobile phones would also need to accommodate universal design. For example, in addition to some attributes shared with public telephones, keys of a reasonable size and variously-shaped function keys would be helpful.<sup>44</sup> The screen should have large characters and high contrast. The connection for receivers or assistive listening devices makes it possible for many more people to use these phones. Screen-readers have been developed for some mobile phones. Many companies are now developing new products with these features to make mobile phones more accessible.

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<sup>41</sup> These recommendations are based on Miyamoto (2004) and Alvarez (n.d.).

<sup>42</sup> Alvarez (n.d.)

<sup>43</sup> Ibid.

<sup>44</sup> Ibid.

### **Box 7: Accessible ATMs in emerging economies**

Incorporating accessible ICT into a range of products can enable those goods to be highly competitive in global markets. This is particularly the case within large developing nations, where these items could improve economies by increasing the flow of capital through the government and through the economy. Accessible ATMs that can speak are very helpful in making this happen. In China, for example, ATM's can be used to deposit cash, top-off mobile phone cards, buy insurance or government bonds and pay for goods through person-to-person cash transfers. These transactions keep cash flowing through the economy. Technologies originally developed for people with disabilities are now being applied specifically in emerging markets to help overcome many other barriers. For example, text-to-speech synthesis can help people who have never learned to read use an ATM. Where electricity is not dependable, ATMs can be powered by solar panels. Where there is a lack of wired communications infrastructures, ATMs can operate wirelessly. ATMs can accommodate high density populations with interfaces that encourage faster transactions. Plain Language, developed for people with cognitive reading disabilities or who are deaf, can economically provide translations for many different languages.

Source: NCTI website; Steve Jacobs and IDEAL Group

## **B: Post-Conflict, Disaster Recovery, Reconstruction and Universal Design**

3.41 With the increased focus on conflict-affected countries and frequently occurring natural disasters, the World Bank is facing a new challenge to effectively deal with emergency relief and reconstruction. In the relief and reconstruction work, incorporating universal design is particularly important because the prevalence of impairments and disability is especially high in post-conflict/disaster environments. More importantly, it can provide a real opportunity for creating a more inclusive society in the process of reconstruction with universal design.

### *Accessible Shelters and Humanitarian Aid*

3.42 Sometimes exclusion of vulnerable groups is even more striking in a crisis than in normal situations. Relief distribution does not necessarily reach the affected populations in a refugee camp in an equal manner. Minority groups, older people, people with disabilities, women and girls tend to be marginalized in survival situations. Therefore, in the emergency response, it is critical that shelters, food and water distribution, and health care services meet universal design principles to reduce discriminatory practices in service provision.

3.43 For instance, shelters should be accessible for all people including people with disabilities, children, elders, etc. instead of segregated facilities. When Hurricane Andrew struck Florida, shelters were totally incapable of accommodating the physical needs of fragile people or people with disabilities.<sup>45</sup> Another survey of people with disabilities living in Bangladesh's cyclone-prone coastal belt found that many were excluded from humanitarian aid because of inaccessible shelters and food distribution mechanisms.<sup>46</sup>

3.44 Shelters should be designed to eliminate barriers that could prevent vulnerable groups from receiving services. Major barriers include: lack of physical access to the facilities, lack of accessible communications and communication in alternative languages and formats, blocked accessible paths by parked law enforcement vehicles, lack of access to the facilities by service dogs, lack of accessible bathrooms, lack of accessible sleeping equipment, lack of access to food and health-care needs, lack of or loss of contact with the rest of the family, lack of facilities for

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<sup>45</sup> Westin (2005).

<sup>46</sup> International Federation of Red Cross and Red Crescent Societies (2007).

electrical or battery power for people who need to recharge power devices.<sup>47</sup> All of these services are not usable by specific groups if universal design has not been considered. For instance, if food distribution or health-care services are available on a different floor, only reachable by stairs, the shelter does not serve everyone.

3.45 In a disaster, there are two classes of people with disabilities who are impacted, those whose disability predates the disaster and who are accustomed to living with their disability and those who have been temporarily or permanently disabled by the disaster and to whom disability is a new and terrible catastrophe. To address these two classes of isabled people it is necessary to include the causes of disability into the rescue process. The rescue process triages victims according to major life threatening conditions and those which are not life threatening. It is vital that the rescue process is designed to accommodate the two classes of people with disabilities, by dealing with the urgent medical needs and restoring function to some, while being sensitive to and accommodating the needs of people with disabilities which predate the disaster. This process is also true for other groups who should be taken into consideration in a rescue effort. The situation of elderly people may be made worse by the disaster. Parents separated from their children must be considered. Therefore, project designers must be assured that these groups are factored into the rescue process. This process is a component of programmatic universal design.

#### *Universal Design in Reconstruction*

3.46 Incorporating universal design into post-conflict/disaster situations with long-term perspective is particularly important as it (ironically) opens up opportunities for reconstructing infrastructure that lends itself to a more inclusive process, including using principles of universal design. Unfortunately, planners often miss the opportunities and recreate the inequitable status quo. In the massive reconstruction efforts in Honduras after Hurricane Mitch, for instance, not one foreign donor stipulated that accessibility codes be applied, although this would have required little or no additional cost. As a result, entire towns, including schools, were rebuilt that perpetuated inaccessible designs, and therefore, continue to be barriers to people with disabilities and others.<sup>48</sup>

3.47 Not incorporating universal design will pose an extra economic and social burden to the country, as it excludes large numbers of people with disabilities and others from productive activities. For instance, if schools are not rebuilt in a way that allows children with disabilities (both those who were previously disabled and the newly disabled) to attend school, this sends a damaging message to the child and places limitations on his or her entire life. The long-term costs are high, since a child who is prevented from going to school is far less likely to find employment and contribute directly to the national or local economy and will thus require lifetime assistance from the state or his or her family.<sup>49</sup>

#### *Importance of Participation of People with Disabilities*

3.48 In post-conflict/disaster environments, where the prevalence of impairments and disability is especially high, people with disabilities should be included in the short- and long-term needs-assessments and management of emergency operations, reconstruction and development. One of the lessons learned from past experience is that people with disabilities should become an intrinsic part of all disaster responses, and if the responses are accessible to

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<sup>47</sup> World Bank (2006).

<sup>48</sup> Oosters (2005).

<sup>49</sup> Ibid.

persons with all types of disabilities (wheelchair users, severely visually and hearing-impaired people, and those with intellectual disabilities) it could most certainly be accessible to older people, children, pregnant women, severely ill patients, and all others.<sup>50</sup>

### *Information Sharing among Relevant Parties*

3.49 Reconstruction offers an opportunity for information on universal design principles and other accessibility guidelines to be shared with all parties working in the areas of reconstruction, such as governments, the private sector, and other agencies. When possible adhering to universal design principles in reconstruction efforts would make a difference toward social inclusion efforts. In emergency and conflict situations, when government players may not be able to orchestrate a recovery effort, it is important to consider that disaster relief may have to come from local communities or agencies outside the country. Involving private sector (NGOs and companies) may be particularly important in post-disaster or conflict situations, as they often arrive long before the government intervention.

3.50 In the recent conflict in Lebanon, for example, a private construction company adopted the accessibility guidelines for reconstructing buildings in Beirut. While there was no accessibility standard in Lebanon before the conflict, these accessibility guidelines are now widely shared and established as standards.<sup>51</sup>

### **Box 8: Post-Tsunami Reconstruction: Access for All Campaign in Sri Lanka**

The massive tsunami, following the Indian Ocean earthquake on December 26, 2004, was one of the deadliest natural disasters in history. It devastated large parts of coastal areas in South East Asia, killed more than 225,000, and seriously injured about half a million in the region. Sri Lanka was one of the hardest hit, with more than 30,000 people killed and 835,000 losing their homes. Of those injured, many will become permanently disabled.

The Access for All campaign was launched in Sri Lanka in the immediate aftermath of the tsunami. A consortium consisting of DPOs and NGOs has been formed to push this campaign, which aims to promote the inclusion of all people with disabilities and their needs in the tsunami relief, reconstruction and rehabilitation work in Sri Lanka.

The first phase of the campaign mainly focused on architectural accessibility. Before the tsunami took place, many buildings were not accessible. Capturing this opportunity, from the early stage, the members from Access for All committee held meetings with other stakeholders involved in reconstruction and rehabilitation activities such as governmental authorities, NGOs and the public sector, and made them aware of the need for accessibility and the needs of people with disabilities. They provide training and consultancy in the area of architectural accessibility.

The members also made sure that water and sanitation facilities would accommodate the special needs of people with disabilities. For example, many people were living in camps or temporary shelters mostly school buildings and temples where the water and sanitation situation was relatively poor. They asked the people's needs very early, so that necessary arrangements were made.

Thus, collaboration with government started very early. The department of social welfare and the DPOs see all the work that the government does and provide consultation for local government authorities and inform them about the needs and possible solutions. Access for All campaign members also made representations to the authority set up by the Government to handle reconstruction and rehabilitation. In this way the government has the input of the people with disabilities.

Due to these efforts, any new public buildings now have to consider architectural accessibility and regulations are in place. All inaccessible public buildings have to be made accessible within a stipulated period. Architectural Accessibility has become law in Sri Lanka.

Source: Access for All; Christian Blind Mission (n.d.).

<sup>50</sup> World Bank (2006).

<sup>51</sup> Loutfy (2008).

## IV. INCLUSIVE DEVELOPMENT AND UNIVERSAL DESIGN

4.01 This paper mainly discusses how to incorporate universal design into Bank operations in order to promote the accessible built environment and products for as many people as possible. While each sector has different elements of universal design, they all show that by focusing on the most vulnerable population as users, the whole built environment and products will be usable by everyone, taking into account safety and comfort.

4.02 While the scope of universal design is primarily limited to physical design of infrastructure and products, it is important to reaffirm that universal design is not only an architectural solution to a problem; it is an overall attitude to humanitarian and development aid -- a part of an effort to promote inclusive development.

4.03 The International Conference on Universal Design adopted the Rio Charter in December 2004 (see Annex 2), which articulated the importance of universal design for inclusive development:

*“...inclusive development...attempts to expand the vision of development, recognizes diversity as a fundamental aspect in the process of socioeconomic and human development, claims a contribution by each human being to the development process, and rather than implementing isolated policies and actions, promotes an integrated strategy benefiting persons and society as a whole. Inclusive development is an effective tool for overcoming the world’s prevailing social exclusion and thus for achieving progress in eradicating poverty.”<sup>52</sup>*

4.04 Universal design is a cost-effective approach to support this agenda, and in fact, not incorporating universal design may strengthen exclusion in development.

4.05 At the same time, universal design is certainly not sufficient for genuine inclusion. In addition to physical barriers, there are a number of other barriers including programmatic barriers, attitudinal barriers and cultural barriers. While this paper focuses on physical aspects of universal design, projects need to address these non-physical aspects of universal design as well.

4.06 Awareness and understanding of the universal design concept and process are still lacking among societies, governments, the private sector, and donor communities. Many do not even have the comprehension of basic standards, building codes, and regulations. Often, accessibility issues are not addressed in the project not because of lack of funds, but because of a lack of awareness.

4.07 Yet, efforts have been made among the donor communities to accommodate universal design into their funded projects. In the area of transportation, for example, the European Conference of Ministers of Transport articulated its commitment to universal design of transportation systems as a requirement for financing (from Western Europe) for projects in Eastern and Central Europe. The Inter-American Development Bank has also made good progress in this area through publications, roundtables, seminars, and a movement toward practical implementation of universal design in its transport projects in Latin America.<sup>53</sup> Furthermore, the

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<sup>52</sup> International Conference on Universal Design (2004).

<sup>53</sup> Rickert (2001).

United Nations Economic and Social Commission for Asia and the Pacific (UNESCAP) facilitated the development of the Biwako Millennium Framework (BMF), which addresses the concept of universal design for all citizens in the development of infrastructure and services especially in the areas of rural and urban development, housing, transport and ICTs.

4.08 Currently, the World Bank does not have a design standard for its projects, nor is universal design a requirement for the approval of loans to countries. National development agencies such as USAID and development agencies in the European Union can predicate grants on the inclusion of specific accessibility standards (Box 9). The World Bank cannot insist on specific accessibility standards unless borrowers already have them. The World Bank, can, however, adopt the principles of universal design as guidance in development projects. For example, the first feasible step would be integrating universal design into its procurement process by establishing procedures which mandate universal design concepts.

**Box 9: Accessibility in USAID-financed construction**

USAID has a requirement of using accessibility standards for its projects. USAID's standards note that the first preference is to use host country, or regional standards for universal access in construction if they exist. These standards must, however, result in at least substantially equivalent accessibility and usability as the standard provided in the Americans with Disabilities Act (ADA), Architectural Barriers Act (ABA), and ADA Accessibility Guidelines (ADAAG). In the absence of local standards that meet this threshold, the ADA and ABA guidelines are to be used.

USAID recognizes that it does not have sufficient expertise in universal design, and thus has a partnership with the US Architectural and Transportation Barriers Compliance Board (Access Board), an independent Federal agency devoted to accessibility for people with disabilities, for developing and providing technical assistance on guidelines and standards.

Recognizing that there may be some circumstances and situations where accessible design is not possible, the policy allows the Agency to authorize a waiver to the guidelines. However, the intention is not that a waiver will be granted for an entire program or project, but rather granted on a case-by-case basis for elements of a specific structure or program. Furthermore, USAID plans to post all granted waivers on their external website.

Source: Feinberg and Horvath (2005).

4.09 In fact, the World Bank should consider the case for adopting principles of universal design in the context of the U.N. Convention on Rights of People with Disabilities (CRPD), which was adopted in December, 2006. Article 9 of the CRPD urges State Parties to enhance accessibility in physical environments, transportation, information and communications, and other public facilities both in urban and rural areas (see Annex 3). The Convention was signed by 126 countries, has been ratified by 20 countries, and came into force on May 3<sup>rd</sup> 2008.<sup>54</sup> This is notable as it also includes a high proportion of developing countries. This creates a reasonable expectation that in the near future many development actors will be asked by developing countries for assistance in implementation of the principles and binding obligations countries will incur upon ratification of the Convention. Also the Convention sets a benchmark for inclusive development of which the World Bank should be aware in order to uphold due diligence, and avoid designing and implementing development activities in contrast with the principles unanimously established by the Convention at the international level.<sup>55</sup>

<sup>54</sup> See UN Enable (<http://www.un.org/disabilities/>) for the latest information.

<sup>55</sup> World Bank Disability website.

## V. CONCLUSIONS

5.01 This paper has demonstrated that universal design is a relevant internationally accepted design concept, worthy of consideration for adoption by the World Bank for use in its projects. Adoption by the World Bank does not necessarily mean a hard and fast mandate. However, as part of its duty of due diligence, under the CRPD, the World Bank might seriously consider whether it can or will adopt some design concept or approach which will integrate the human rights of people with disabilities and universal design into its projects.

5.02 Another reason for adopting universal design is to promote poverty reduction as mandated in the MDGs. People with disabilities, women, children and elderly persons are likely to be the poorest of the poor. By adopting universal design, the World Bank could take one more step in beginning to alleviate poverty.

5.03 The World Bank cannot adopt universal design in a vacuum. After all, the World Bank is primarily a lending institution. Therefore, the World Bank moves forward taking into consideration the views of its shareholders, borrowers, and its obligations as a U.N. agency to the international community.

## **ANNEX 1: TERMINOLOGY**

### **Accessibility**

In a general sense, accessibility is a feature which allows an environment, object or instrument to be used safely by all people in the most equitable, independent and comfortable manner possible. For technical use, it is a stringent standards that have been mandated nationally or internationally for the construction of the built environment.

### **Barrier**

Those aspects of society that intentionally or unintentionally exclude people with disabilities from full participation and inclusion in society. Barriers can be physical, informational, legal, institutional, environmental, attitudinal etc.

### **Built environment**

That which is commissioned, designed, constructed and managed for use by people and which includes the external and internal environments and any component, facility or product that is a fixed part of them.

### **Disability**

This is the result of the process of disablement, which occurs when people with impairments experience barriers to their full participation in society and their recognition, enjoyment or exercise of human rights and fundamental freedoms in the civil, political, economic, social, cultural or any other field.

### **Ergonomics**

The discipline which investigates human behavior, habits, limitations and other characteristics and applies this information in the design of environments, tools, objects and machinery to ensure productive, safe, comfortable and effective human use. Ergonomics seeks to optimize the interaction between human beings, physical space and the objects, tools and equipment which are part of any human activity within a given environment.

### **Impairment**

This concept encompasses the full and diverse range of functional impairments including physical, sensory, neurological, psychiatric and intellectual - all of which may be permanent, intermittent, temporary, or perceived as impairment by society but not necessarily by individuals.

### **Inclusive Design**

A process whereby designers, manufacturers and service providers ensure that their products and environments address the widest possible audience, irrespective of age or ability.

### **Long-term or effective irreversible effect**

On people with disabilities means possible impacts that can have a lasting adverse influence on the ability of the disabled person to participate in societies' activities. For example, a disabled child denied physical or social access to education can have an effect that continues into adulthood or a missed training opportunity for an adult disabled person which denies them the ability to be employable and constitutes a lasting barrier into old age. (In accordance with OP 4.01, paragraph 8 under Environmental Screening and footnote 10, irreversible impacts may be considered "sensitive").

**Medical/charity model of disability**

Now considered out-dated and disempowering as an exclusive conceptual framework for disability, it emphasizes the impairment and the functioning of the person as being the central issue, focusing upon treatment, cure and charitable assistance as methodologies for improving the lives people with disabilities.

**Physical Accessibility**

A characteristic of the built environment whose quality is independent on the usability of the means of access to, into it and within it and which can be determined by measurement or other agreed means.

**Reasonable Accommodation**

Necessary and appropriate modification and adjustments not imposing a disproportionate burden, where needed in a particular case, to ensure to persons with disabilities the enjoyment or exercise on an equal basis with others of all human rights and fundamental freedoms.

**Social/cultural model of disability**

Based on a rights-based approach to disability, it understands disability as being society, not impairments, that disables individuals. In other words "disability" is not something that people possess, or that is inherent to the person or group, but rather it is the inability of society to recognize difference and remove barriers that inhibits the full inclusion and participation of people with disabilities. The social model emphasizes the removal of societal barriers that exclude people with disabilities, including environmental, institutional, and attitudinal barriers.

**Universal Design**

The design of products and environments to be usable by all people, to the greatest extent possible, without need for adaptation or specialized design.

**Visit-ability**

The ability of a person, with or without disabilities or special needs, to temporarily visit a specific piece of the built environment.

## **ANNEX 2: RIO CHARTER: “UNIVERSAL DESIGN FOR SUSTAINABLE AND INCLUSIVE DEVELOPMENT”**

Having met in Rio de Janeiro, Brazil, on December 12, 2004, in the International Conference on Universal Design, “Designing for the 21<sup>st</sup> Century”, as women and men from various countries in Latin America, including professionals, representatives of NGOs and various sectors of civil society, universities, employees of government institutions, and international and multilateral agencies, we hereby agree to the following declaration:

1. The purpose of **Universal Design** is to serve needs and make possible social participation and access to goods and services by the widest possible range of users, contributing to both the inclusion of persons who have been prevented from interacting in society and to their development. Examples of such groups include: poor persons, persons marginalized for reasons of culture, race, or ethnicity, persons with different types of disabilities, very obese persons and pregnant women, very tall or very short persons, including children, and all those who for different reasons have been excluded from social participation.
2. We conceive of **Universal Design** as generating accessible environments, services, programs, and technologies that are equitably, safely, and autonomously usable by all individuals – to the widest extent possible – without having to be specifically adapted or readapted, based on the seven underlying principles, as follows:
  - Equitable Use (for persons with diverse abilities);
  - Flexibility in Use (by persons with a wide range of preferences and abilities);
  - Simple and Intuitive (easy to understand);
  - Perceptible Information (communicates necessary information effectively)
  - Tolerance for Error (minimizes hazards of unintended actions);
  - Low Physical Effort; and
  - Size and Space for Approach and Use.
3. We acknowledge the value of the emerging concept of **Inclusive Development**, which attempts to expand the vision of development, recognizes diversity as a fundamental aspect in the process of socioeconomic and human development, claims a contribution by each human being to the development process, and rather than implementing isolated policies and actions, promotes an integrated strategy benefiting persons and society as a whole. Inclusive Development is an effective tool for overcoming the world’s prevailing social exclusion and thus for achieving progress in eradicating poverty.
4. We conceive of **Sustainable Human Development** as a productive way of understanding social policies, considering the links between economic growth, equitable distribution of its benefits, and living in harmony with the environment.
5. We see that poverty and social exclusion affect millions of people worldwide, prevent human development and a decent life with quality – and that in Latin America and the Caribbean this situation affects over half of the population. We are also convinced that exclusion and poverty, together with inequality, diseases, insecurity, environmental pollution and degradation, and inadequate design are public hazards affecting many people and threatening everyone.

6. Within the prevailing context of development based on exclusion, we pose the following challenges:
  - How to apply the principles of Universal Design when there are people whose main concern is not “tomorrow”, but the uncertainty as to their next meal ... or who lack housing and the most basic health care?
  - How to make Universal Design principles consistent with the fact that for the majority of the world the concepts of “basic standards”, “building codes”, and “regulations” are non-existent?
  - In this situation, what real meaning is there in such services as “the bathroom”, “the kitchen”, “the lobby”, “the ramp”, “the lighting”, or “the acoustics”?
  - And especially, how to add quality of life by applying Universal Design?
7. We emphasize that the current application of inadequate design to programs, services, and infrastructure generates inaccessibility and perpetuates conditions of exclusion for the future. We find it unacceptable that public resources continue to be used to construct any kind of barrier.
8. We agree that Universal Design should become an indispensable component in policies and actions to promote development, in order for it to be truly inclusive and to effectively contribute to the reduction of poverty in the world.
9. We also agree that in order to make progress towards **Universal Design for Sustainable and Inclusive Development**, all new actions will require the following:
  - be planned with a balance between legal, human-rights, economic, technological, and local cultural issues;
  - meet the community’s real needs;
  - include participation by stakeholders;
  - incorporate Universal Design criteria in order to prevent investments from generating extra costs for adaptations needed in the future;
  - apply locally available materials and technologies at the lowest possible cost;
  - plan for maintenance with local means; and
  - provide adequate training to allow increasingly extensive application of Universal Design.
10. We are convinced that in order for Universal Design to become an instrument at the service of Inclusive Development, it is necessary that all stakeholders in these issues (states and governments, private sector, civil society, civil society organizations, universities, professionals, and international and regional agencies) play active roles, in keeping with the following lines of action:
  - Governments should make efforts to achieve legal instruments for Universal Design to be applied permanently and as a cross-cutting component of national development plans and public policies.
  - The private sector should be attracted to apply Universal Design to products and services, and the theme should become a public interest matter.

- Universities should promote Universal Design for training the professions related to this concept, fostering research that allows the expansion, application, and development of Universal Design.
  - Professionals directly related to Universal Design should furnish technical guidelines in order to achieve its more effective and efficient application, focused on local development and social inclusion.
  - The organizations currently most aware of the need for Universal Design should contribute to spreading the concept to other sectors of civil society and play an active role in social vigilance in order to make on-going progress in accessibility and inclusion through its effective application.
  - International and regional agencies should make progress in the legal framework with the support of international and regional technical standards and guidelines promoting the sustainable application of Universal Design at the service of Inclusive Development.
  - Multilateral lending agencies should make Universal Design a development issue and promote its advancement, practical application, research, and dissemination with economic resources and adopt it as a basic standard for designing projects and as a requirement for the approval of loans to countries.
11. We feel that all efforts and actions in this direction will be stronger and more effective to the extent that we move towards a common agenda for Universal Design and Inclusive Development and build alliances and partnerships between the different sectors and stakeholders. Yet it is still necessary to create networks to promote these issues, to contribute to their spread and constructive debate, and to empower the various efforts.
12. Finally, we hereby state that we are deeply convinced that if we work to build a world guided by the principles of Universal Design and Inclusive Development, it will be a better, more peaceful, more inhabitable, and more equitable world and certainly one with better quality of life.

Rio de Janeiro, December 12, 2004.

## **ANNEX 3: UN CONVENTION ON THE RIGHTS OF PERSONS WITH DISABILITIES (CRPD) ARTICLE 9: ACCESSIBILITY**

1. To enable persons with disabilities to live independently and participate fully in all aspects of life, States Parties shall take appropriate measures to ensure to persons with disabilities access, on an equal basis with others, to the physical environment, to transportation, to information and communications, including information and communications technologies and systems, and to other facilities and services open or provided to the public, both in urban and in rural areas. These measures, which shall include the identification and elimination of obstacles and barriers to accessibility, shall apply to, inter alia:

- a) Buildings, roads, transportation and other indoor and outdoor facilities, including schools, housing, medical facilities and workplaces;
- b) Information, communications and other services, including electronic services and emergency services.

2. States Parties shall also take appropriate measures:

- a) To develop, promulgate and monitor the implementation of minimum standards and guidelines for the accessibility of facilities and services open or provided to the public;
- b) To ensure that private entities that offer facilities and services which are open or provided to the public take into account all aspects of accessibility for persons with disabilities;
- c) To provide training for stakeholders on accessibility issues facing persons with disabilities;
- d) To provide in buildings and other facilities open to the public signage in Braille and in easy to read and understand forms;
- e) To provide forms of live assistance and intermediaries, including guides, readers and professional sign language interpreters, to facilitate accessibility to buildings and other facilities open to the public;
- f) To promote other appropriate forms of assistance and support to persons with disabilities to ensure their access to information;
- g) To promote access for persons with disabilities to new information and communications technologies and systems, including the Internet;
- h) To promote the design, development, production and distribution of accessible information and communications technologies and systems at an early stage, so that these technologies and systems become accessible at minimum cost.

## **ANNEX 4: ACCESSIBILITY STANDARDS & GUIDES<sup>56</sup>**

### **International**

#### International Standards Organization (ISO)

- ISO TC 59/SC16: Accessibility and usability of the built environment (under development)
- ISO TR 9527: Building construction – Needs of disabled people in buildings – Design Guidelines (1994)
- ISO Guide 71: Guidelines for standards developers to address the needs of older persons and persons with disabilities
- ISO 7000: Graphic symbols to be employed in indices and synoptic tables
- ISO 7001: Public information symbols
- ISO 9241-171: Ergonomics of human-system interaction -- Part 171: Guidance on software accessibility (2008)
- ISO 9241-20: Ergonomics of human-system interaction -- Part 20: Accessibility guidelines for information/communication technology (ICT) equipment and services. (2008)
- ISO 9241-151: Ergonomics of human-system interaction -- Part 151: Guidance on World Wide Web user interfaces (2008)

### **Asia and the South Pacific**

- Promotion of Non-Handicapping Physical Environment for Disabled Persons: Guidelines [By UN Economic and social commission for Asia and the Pacific]  
[http://www.unescap.org/esid/psis/disability/decade/publications/pnedp/index\\_pdf.asp](http://www.unescap.org/esid/psis/disability/decade/publications/pnedp/index_pdf.asp)
- Physical Accessibility and Disability in Afghanistan [By STEPS, 2005]

### **EU Countries**

#### European Commission (EC)

- European Concept for Accessibility: Technical Assistance Manual 2003
- Communication from the Commission to the Council, the European Parliament, the Economic and Social Committee and the Committee of the Regions: Towards a Barrier Free Europe for People with Disabilities

#### European Parliament and Council of European Union

- Directive 2001/85/EC of the European Parliament and of the Council of 20 November 2001 relating to special provisions for vehicles used for the carriage of passengers comprising more than eight seats in addition to the driver's seat, and amending Directives 70/156/EEC and 97/27/EC

### **Latin America and the Caribbean**

#### Pan-American Standards Commission (COPANT)

- Accessibility Standards of COPANT
- Accessibility of the persons to the physical environment. Buildings. Hygienic accessible services (COPANT 1706:2006)
- Accessibility of the persons to the physical environment. Buildings. Accessible Doors (COPANT 1705:2006)

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<sup>56</sup> World Bank Disability Knowledge Toolkit provides the comprehensive list of physical accessibility international and regional standards (<http://go.worldbank.org/1GR2FNGGX0>).

- Manual de Diseño de Lugares Accesibles (an illustrated manual on accessible design, in Spanish) [By APRODDIS (Asociación pro Desarrollo de la Persona con Discapacidad, Peru)] <http://www.un.org/esa/socdev/enable/guiadd/aproddis.htm>

### **Middle Eastern and North Africa**

- Accessibility for the Disabled: A Design Manual for a Barrier Free Environment [By Lebanese Company for the Development and Reconstruction of Beirut Central District, in collaboration with the UN Economic and Social Commission for Western Asia] <http://www.un.org/esa/socdev/enable/designm>

### **United States**

#### Americans with Disabilities Act (ADA)

- Buildings: ADA Standards for Accessible Design (<http://www.usdoj.gov/crt/ada/stdspdf.htm>)
- Public Transport\_ ([http://www.fta.dot.gov/civilrights/civil\\_rights\\_2360.html](http://www.fta.dot.gov/civilrights/civil_rights_2360.html))
- Buildings and Facilities: ADA Accessibility Guidelines (ADAAG) <http://www.access-board.gov/adaag/ADAAG.pdf>

## ANNEX 5: RESOURCES

### **Universal Design General Information/Organizations**

**The Center for Universal Design** <http://www.design.ncsu.edu/cud/> The CUD is a national information, technical assistance, and research center that evaluates, develops, and promotes accessible and universal design in housing, commercial and public facilities, outdoor environments, and products. It also developed the principles of universal design in collaboration with a consortium of UD researchers and practitioners across the US.

**The Center for Inclusive Design and Environmental Access (IDEA Center) at State University of New York-Buffalo** <http://www.ap.buffalo.edu/idea/Home/index.asp> IDEA provides resources and technical expertise in architecture, product design, facilities management and the social and behavioral sciences to promote universal design.

**United States Architectural and Transportation Barriers Compliance Board (Access Board)** <http://www.access-board.gov/> The Access Board is an independent Federal agency devoted to accessibility for people with disabilities. Created in 1973 to ensure access to federally funded facilities, the Board is now a leading source of information on accessible design. It develops and maintains design criteria for the built environment, transit vehicles, and ICT.

**IDEAL group:** <http://www.ideal-group.org> IDEAL Group is a professional services organization with the mission is to drive the design of ICT that are accessible by the greatest number of consumers as technically possible and economically feasible:

**International Best Practices in Universal Design: A Global Review** [http://www.chrc-ccdp.ca/pdf/bestpractices\\_en.pdf](http://www.chrc-ccdp.ca/pdf/bestpractices_en.pdf)

**Universal Design: General Concepts, Universal Design Principles and Guidelines** [http://trace.wisc.edu/world/gen\\_ud.html](http://trace.wisc.edu/world/gen_ud.html)

**The Center for an Accessible Society: Universal Design** <http://www.accessiblesociety.org/topics/universaldesign/>

**Rolling Rains Report** <http://www.rollingrains.com/> Precipitating Dialogue on Travel, Disability, and Universal Design.

**UniversalDesign.com** <http://www.universaldesign.com/> Run by Universal designers & Consultants, which provide services including assessments, training, and consultations on accessibility and universal design.

**Adaptive Environments – Human Centered Design** <http://www.adaptenv.org/index.php?option=Home> AE is an international non-profit organization, committed to advancing the role of design in expanding opportunity and enhancing experience for people of all ages and abilities. AE's work balances expertise in legally required accessibility with promotion of best practices in human-centered or universal design.

## **Universal Design / Accessibility Standards Resources**

<http://www.miusa.org/ncde/tipsheets/ud/?searchterm=universal%20design>

## **Universal Design and Sectors**

### **Water and Sanitation**

- Water and Sanitation for Disabled People and Other Vulnerable Groups  
<http://wedc.lboro.ac.uk/publications/details.php?book=1%2084380%20079%209>

### **Education**

- UNESCO Inclusive education [www.unesco.org/education/inclusive/](http://www.unesco.org/education/inclusive/)

### **Transportation**

- Bus Rapid Transit Accessibility Guidelines  
<http://siteresources.worldbank.org/DISABILITY/Resources/280658-1172672474385/BusRapidEngRickert.pdf>
- Sustran <http://www.geocities.com/sustranet/> An email discussion list devoted to people-centred, equitable and sustainable transport with a focus on developing countries.
- Accessible Transportation around the World [www.globalride-sf.org](http://www.globalride-sf.org)
- Accessible Design for Blind [www.accessforblind.org](http://www.accessforblind.org)
- European research Action [www.bestgroup.cc/cost349/](http://www.bestgroup.cc/cost349/)
- UK Department of Transport [www.dft.gov.uk](http://www.dft.gov.uk) including information for people with disabilities, elders, children, women, ethnic minorities, etc.
- Disabled Persons Transport Advisory Committee (DPTAC)  
[www.dptac.gov.uk/pubs/smallbus](http://www.dptac.gov.uk/pubs/smallbus)
- [www.embarq.wri.org](http://www.embarq.wri.org)

### **Urban Development**

- Operational Guidelines on Accessibility in Urban Development Projects  
[http://www.iadb.org/sds/SOC/publication/gen\\_6191\\_4180\\_e.htm](http://www.iadb.org/sds/SOC/publication/gen_6191_4180_e.htm)

### **ICT**

- World Wide Web Consortium <http://www.w3.org/>
- Web Accessibility Initiative <http://www.w3.org/WAI/>
- ICT for Development: Development Gateway  
<http://topics.developmentgateway.org/ict/sdm/previewDocument.do~activeDocumentId=399217?activeDocumentId=399217>
- WorldEnable <http://www.worldenable.net/>

## **Disability Issues**

### **UN International Convention of the Rights of Persons with Disabilities**

<http://www.un.org/disabilities/convention/>  
<http://www.un.org/disabilities/convention/media.shtml>

### **Multilateral and Bilateral Development Organisation**

- World Bank Disability Website: <http://www.worldbank.org/disability>
- World Bank Disability Toolkit <http://disabilitytoolkit> (World Bank intranet)
- UN Eable [www.un.org/esa/socdev/enable](http://www.un.org/esa/socdev/enable)
- USAID Disability and Development [www.usaid.gov/about\\_usaid/disability/](http://www.usaid.gov/about_usaid/disability/)
- Sida Disability  
[http://www.sida.se/sida/jsp/sida.jsp?d=847&a=16354&language=en\\_US&searchWords=disability](http://www.sida.se/sida/jsp/sida.jsp?d=847&a=16354&language=en_US&searchWords=disability)
- UNESCAP Disability program <http://www.unescap.org/esid/psis/disability/>
- Health Link <http://www.healthlink.org.uk/projects/disability.html>
- Inter-American Development Bank (IDB) :[http://www.iadb.org/sds/SOC/site\\_6190\\_e.htm](http://www.iadb.org/sds/SOC/site_6190_e.htm)

### **NGOs/NPOs**

- International Information Resource Center  
[http://www.asksource.info/res\\_library/disability.htm](http://www.asksource.info/res_library/disability.htm)
- VSO <http://www.vso.org.uk>
- International Disability and Development Consortium [www.iddc.org.uk/](http://www.iddc.org.uk/)
- Action on Disability & Development [www.add.org.uk](http://www.add.org.uk)
- BOND Disability and Development group  
[www.bond.org.uk/wgroups/disability/index.html](http://www.bond.org.uk/wgroups/disability/index.html)
- Disabled People's International <http://www.dpi.org/>
- Inclusion International <http://www.inclusion-international.org/>
- Mobility International USA <http://www.miusa.org/>
- Christian Blind Mission [www.cbm.org](http://www.cbm.org)
- Shia <http://www.shia.se/index.php?l=en&p=index>

## **ANNEX 6: HOW INTERNATIONAL DONORS ARE ADDRESSING DISABILITY**

**Asian Development Bank:** Developed “Disability Brief Identifying and Addressing the Needs of Disabled People.”

**Austria:** Reference to the needs of children and people with disabilities is an integral part of the law that established the Austrian Development Agency (2003).

**Denmark:** The study, “From Charity toward Inclusion: The Way Forward for Disability Support through Danish NGOs” (2000), was commissioned by the Ministry of Foreign Affairs/Danish International Development Agency (DANIDA). It resulted in 13 recommendations for DANIDA’s criteria for disability support.

**European Union:** In March 2003, the EU produced a guidance note on disability and development for EU delegations and services to address disability in their daily work. Three EU-ACP (African Caribbean Pacific) resolutions have also passed since 2001 that are relevant to mainstreaming disability.

**Finland:** “Disability Dimension in Development Action” (2000) is the result of intensive collaboration between disabled people’s organizations (DPOs) and the Department of International Development Co-operation (DIDC) to create an explicit policy on disability and development.

**Inter-American Development Bank:** [http://www.iadb.org/sds/SOC/site\\_6190\\_e.htm](http://www.iadb.org/sds/SOC/site_6190_e.htm)

**Italy:** The Italian Cooperation “Guidelines Concerning Disabled People” (2003) has been adopted by the General Directorate for Development Cooperation of the Ministry of Foreign Affairs.

**Nordic Countries:** After almost a decade of intensive collaboration between DPOs and Development Cooperation and/or ministries of foreign affairs, Norway, Denmark, Finland and Sweden have approved a document with steps to include disability in Nordic development cooperation.

**Norway:** The Norwegian Agency for Development Cooperation (NORAD) produced guidelines on “Planning and Monitoring for the Inclusion of Disability Issues in Mainstream Development Activities” in 2002.

**Sweden:** The Swedish International Development Agency’s “Development Cooperation for Children and Adults with Disabilities” (1999) summarizes previous experience and current international policy issues with a strong human rights approach.

**United Kingdom:** The Department for International Development (DFID) has adopted a twin-track approach to disability. This approach seeks to mainstream disability issues alongside specific initiatives to empower and enhance the lives of people with disabilities.

**United States:** The US Agency for International Cooperation (USAID) has a mandatory reference policy paper that articulates its commitment to pursue advocacy for, outreach to and inclusion of people with physical and mental disabilities, to the maximum extent feasible, in the design and implementation of USAID programming, and provides guidance for making that commitment

operational (e.g., through standards for accessibility in USAID-financed construction). It is the product of a comprehensive consultative process between USAID and its partners and responds to issues identified in that process. In addition, the United States Congress has required the State Department to include the human rights conditions of people around the world with disabilities in its annual country reports.

**World Health Organization (WHO):** Disability prevention and rehabilitation is a key focus area of the WHO, which has taken the lead in programs to eliminate and reduce the incidence of disabling diseases, such as polio, TB and malaria. WHO champions and supports the development of community-based rehabilitation across the world. It also leads in the gathering of disability data and has developed the International Classification of Functioning, Disability and Health (ICF) to act as a global system for data collection.

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