

# Accessibility to Services

Of Water and Sanitation, Energy and  
Transportation for People With Disabilities  
in Latin America and the Caribbean

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This document has been drafted with the goal of providing information about accessibility barriers and examples of good practices in terms of accessibility and inclusion of People with Disabilities (PwD) in the Infrastructure and Energy sector, specifically in the areas of Water and Sanitation, Energy and Transport.

The document brings together research and case studies on the physical, social and communication barriers faced by PwD in accessing public services, including examples of good practice in accessibility to these services. The document is framed within the United Nations Sustainable Development Goals (SDGs), primarily Goal 11, “Making cities and human settlements inclusive, safe, resilient and sustainable” (UNDP 2019).

## Executive Summary

The United Nations Convention on the Rights of Persons with Disabilities (CRPD) recognizes a social model of disability in which PwD are regarded as subjects with rights. This differs from previous models, such as the biomedical or rehabilitation model, in which PwD were regarded as objects of charity and subjects requiring assistance. This document follows the social model definition of disability which emphasizes the relationship between a person’s impairment and the barriers present in their environment. This model locates the barriers in the context rather than in the person (Duryea et al., 2019).



This document is part of the joint work between the Infrastructure and Energy Sector and the Gender and Diversity Division of the IDB. It was prepared by consultant Diana Marcela Sandoval Rincón, based on the guidelines of specialists from the Water and Sanitation (WSA), Energy (ENE) and Transport (TSP) Divisions and it was reviewed by specialists from the Gender and Diversity Division (GDI). The overall coordination of the document was carried out by the Social Infrastructure Unit (UIS).

The Infrastructure and Energy sector (INE) is working to reduce accessibility gaps by improving service delivery within the sector, incorporating international best practice. This document continues this line of work by analyzing experiences and providing recommendations for the application of accessibility measures in INE operations.

## Background

This Guide benefited from the collaboration of Suzanne Duryea, Mariana Pinzón Caicedo and Juan Pablo Salazar from the Gender and Diversity Division (GDI) and Livia Minoja, Iciar Hidalgo Roca, Juliana De Moraes and Beatriz Toribio from the Social Infrastructure Unit (UIS), who collaborated in the revision and completion of the document.

We would also like to thank Virginia Snyder, Odile Johnson, Lauramaría Pedraza, Carlos Arias Andrade, Wilhelm Dalaison, Mauro Nalesso, Germán Sturzenegger, Manuel Rodríguez Porcel and María Antonella Pereira, who provided technical contributions in their areas of expertise.

# Introduction

The aim of the document is to report on barriers to access to public services for PwD and to show examples of good practices that have removed and reduced these barriers. First, the concept of accessibility is understood as ***“the degree to which an environment, service or product is accessible to as many persons as possible, in particular PwD”*** (emphasis added, not from the original text) (WHO - WB 2011, 339)<sup>1</sup>. This document begins with a brief analysis of the **normative context** on accessibility to public services for PwD, presenting the global and national legal framework of standards that support the rights of PwD and their accessibility to public services for Latin America and the Caribbean (LAC). Thereafter, the **types of barriers** (architectural, urban, communication and electronic) associated with the **provision of public water and sanitation, energy and transport services are**

1. While accessibility refers to the degree to which an environment, service or product allows access to as many persons as possible, it is also directly related to the equal opportunities a person might have to develop in life. In this sense, universal accessibility and design for all are fundamental elements for the change in perspective that must take place for the real inclusion of PwD and their access to public services. Universal design aims to make products and environments usable by everyone, to the greatest extent possible. In this sense, “the universal dimensions of access must: (a) recognize the social context, (b) consider the person’s situation, (c) take into account age and cultural factors, and (d) support analysis in relation to the person and the environment. (D. C. Hidalgo, Políticas de mejoramiento para la accesibilidad universal en los sistemas de transporte público de América Latina 2019, 3).

**described.** This document identifies accessibility barriers and good practices (local and international examples relating to states and public and private companies) of accessibility to public services for PwD. Finally, the conclusions present opportunities for improvement that can be applied to eliminate -or reduce- barriers to accessing public services and the report ends **with a summary table** that synthesizes the results.

The following table illustrates the structure of this document (Table 1).

Table 1 Structure of the investigation into accessibility to public services			
Structure of the document			
1. Presentation			
2. LAC Regulatory framework			
3. Accessibility to public services			
Types of accessibility	Water and sanitation services	Energy services	Transportation services
Architectural and urban accessibility	Physical barriers		
Social inclusion	Social barriers		
Accessibility to ICT	Communication barriers		
Best practices	Physical accessibility		
	Accessibility to communication		
	Awareness and empathy campaigns		
4. Conclusions			

Source: own elaboration

# Regulatory framework on accessibility to public services and transportation for People with Disabilities in Latin America and the Caribbean

## 3.1 Convention on the Rights of Persons with Disabilities

The Convention on the Rights of Persons with Disabilities (CRPD), which entered into force in 2008, aims to “promote, protect and ensure the full and equal enjoyment of all human rights and fundamental freedoms by all PwD, and to promote respect for their inherent dignity”. (UN 2006).

The term accessibility of public services and passenger transport is intended to “*ensure access for PwD, on an equal basis with others, to the physical environment, transport, information and communications, including information and communications technologies and systems, and other services and facilities open or provided to the public, both in urban and rural areas*” (UN 2006, 10).

In the CRPD, the articles refer to accessibility, adequate standard of living and social protection, access to safe

drinking water, affordable and accessible mobility, employment support and the collection of statistical data on PWDs. The CRPD is a legally binding instrument that ensures that States that have ratified it will promote and protect the rights of PwD. Once the Convention has been signed and ratified, States enact their own national legislation on the rights of PwD in accordance with the articles of the Convention (Organización Mundial de la Salud 2013).

## 3.2 Sustainable Development Goals

The 2030 Agenda for Sustainable Development sets out 17 goals and 169 targets covering economic, social and environmental areas. Within this international context of inclusion are the United Nations Sustainable Development Goals (SDGs). These are the goals set to “end poverty, protect the planet and ensure prosperity for all” (Naciones Unidas s.f.). Disability is mentioned in several parts of the SDGs and specifically in the parts related to education, growth and

employment, inequality, accessibility of human settlements, as well as data collection and monitoring of the SDGs. Among the objectives in which reference is made to disability are:

- **Objective 4:** *“Ensuring inclusive and equitable quality education and promoting lifelong learning opportunities for all”* (UN 2013). This proposal aims to ensure equal access to all levels of education and vocational training for PwD. It also requires building and adapting educational facilities for access to PwD.
- **Objective 8:** *“Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all”* (UN 2013). This objective aims to ensure employment for both men and women, including PwD, and also promotes equal pay.
- **Objective 10:** *“Reducing inequality within and between countries”* (UN 2013). Empowering and promoting the social, economic and political inclusion of all, including PwD.
- **Objective 11:** *“Making cities and human settlements inclusive, safe, resilient and sustainable”* (UN 2013). To achieve this goal, access to safe, affordable, accessible and sustainable transport systems, road safety and attention to the needs of PwD must be ensured. There is a need to provide universal access to safe and inclusive spaces.

- **Objective 17:** *“Strengthening the means of implementation and revitalization of the Global Partnership for Sustainable Development”* (UN 2013), in this aspect, data collection and monitoring are promoted in order to have data and statistics to follow up on the real accessibility of PwD in society, among others.

The 2030 Agenda establishes a common global obligation, however, given that each country has different challenges in its pursuit of sustainable development, States have autonomy over their wealth, resources and economic activity, and each will determine their national targets, based on the SDGs.

### **3.3 National laws in Latin American and Caribbean countries on the rights of people with disabilities**

The 26 countries that make up the IDB have national legislation that promotes the rights of PwD, as well as accessibility and universal design. Measures associated with the right to accessibility focus on: a) the elimination of existing physical, architectural, communication, information and transport barriers; b) independent living (right to autonomy); c) active participation in society (labor inclusion); d) the right to privacy; and (e) equality of conditions. (OAS 2016).

Despite the existence of a legal framework related to the rights of PwD in the region, the reports of the Committee on the Rights

of Persons with Disabilities show a lack of adoption, verification and implementation of the provisions.

The Inter-American Court of Human Rights establishes that States must comply with general obligations to respect and guarantee the Human Rights of vulnerable persons, but it is not enough to refrain from breaching their rights; it is necessary to take measures to prevent breaches from occurring (M. Á. Abdiel Barboza 2014a). In other words, countries are invited to go a step further. For example, in the case of removing architectural, information and transport barriers, in addition to adapting the infrastructure and making it accessible, it would be necessary to train support personnel (M. Á. Abdiel Barboza 2014a). Exclusion also occurs when the rural population cannot access services such as drinking water, sanitation or energy and this lack of access generates problems that put the person's health at risk or increase disability.

The international and national legal frameworks indicate that accessibility laws exist for the 26 countries analyzed in the region in accordance with the CRPD. These laws include the rights of PwD, their access to health, employment and transport, but few explicitly mention public water, sanitation and energy services. This means that it is of great importance to work with the countries of the region in the dissemination and knowledge of the rights of PwD, as well as the need to institutionalize, follow up and enforce the existing accessibility standards. For this it is essential to: (i) Promote the collection of data and statistics on the access of the population with disabilities to public services; (ii) Facilitate the appointment of representatives of the Disability Councils in the National and Municipal Governments, since the Councils are the entities generally responsible for monitoring compliance with the CRPD at the local level; and (iii) Verify compliance with accessibility standards, from the physical, social, communicational and operational aspects.

## Diagnosis of accessibility to public services for People with Disabilities

In Latin America and the Caribbean, the provision of public services has increased in recent years, reaching 94.6% of the population with access to safe drinking water and 83.1% to improved sanitation (IDB 2017). In terms of electricity supply, the average access in Latin America and the Caribbean (LAC) is 97%, with the exception of Haiti, which has only 30% access. (IDB-OLADE 2018). Data on the penetration of water, sewage and electricity services in the region suggest that the supply of services varies according to the general infrastructure of each country. The countries that have invested the most capital in building networks will be the ones that serve their citizens most comprehensively.

According to ECLAC, *“the most economically and socially vulnerable population groups also have higher rates of disability: the elderly, rural dwellers, indigenous persons and Afro-descendants, and persons with lower incomes. These groups experience a higher incidence (or greater intensity) of PwD due to lack of timely care and lack of resources or access to relevant services”* (ECLAC 2012, 45).

As mentioned by Duryea et al. (2019), vulnerable persons, who are at higher risk of disability, tend to live in areas where infrastructure and services are less likely to be accessible. The problem of lack of physical accessibility to public services depends on cultural, economic, social and geographical contexts,<sup>2</sup> among others, as well as the type of disability a person may have. Depending on each disability and the accessibility of public water and sanitation, energy and transport services, there will be more or less profound and/or complex barriers. An example of this is a person with reduced mobility who has more difficulty using a hand pump or latrine than a person with a hearing or intellectual disability. It is also possible that a person with a disability, even if they have no difficulty in getting around, may experience mistreatment or

2. In Latin America and the Caribbean, the level of coverage of urban services is higher than in rural areas. According to WHO and Unicef estimates, in urban areas coverage is 97% of the population and sanitation 88%, while in rural areas the values are 84% and 64% respectively (IDB 2015). Regarding access to energy, the outlook is positive for Latin American countries, but Haiti is the country whose population has the least access to energy, at only 30% of the population. (IDB-OLADE 2018). The majority of the population without access to public services is located in rural areas.



ridicule and therefore the service becomes inaccessible for social and safety reasons (Groce, Bailey y Lang 2011).

This document deals with **accessibility**<sup>3</sup> -which covers multiple variables and dimensions- based on the categorization proposed by the Accessibility Observatory of the Spanish Confederation of Persons with Physical and Organic Disabilities (Cocemfe) and includes the following categories:

1. **Architectural accessibility:** refers to public and private buildings.
2. **Urban accessibility:** refers to the urban and physical environment.
3. **Accessibility to communication:** refers to individual and collective information.
4. **E-accessibility:** refers to the ease of access to Information and Communication Technologies (ICT) and Internet content by any person, even if they have a disability, advanced age or circumstantial deprivation. (Cocemfe 2019).

Categories s3 and 4 are grouped together in this document to

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3. According to general comment No. 2 “Accessibility” of the CRPD: Accessibility is a pre-requisite for PwD to achieve independent living and full and equal participation in society. Without access to the physical environment; to transportation; to information and communications, including information systems and technologies, as well as to other facilities and services open or provided to the public; PwD would not have equal opportunities to participate in their respective societies.” (UN 2014)

address the issue more precisely. In addition, an analysis of the social dimension is included, using the concept of social inclusion indicated in the *Spanish Judicial Dictionary* (DEJ) of the Spanish Royal Language Academy (RAE) and of the General Council for the Courts (CGPJ), as it raises the issue of PwD from the outset:

5. **Social inclusion:** “Principle by virtue of which society promotes shared values aimed at the common good and social cohesion, enabling all **PwD to have the opportunities** and resources necessary to participate fully in political, economic, social, educational, occupational and cultural life in order to enjoy living conditions on an equal basis with others.” (Real Academia Española 2016).<sup>4</sup>

In terms of **good practices**, this document follows Article 28 of the *CDPD*, which states that the development of a good practice should take into account the right of PwD to an adequate standard of living for themselves and their families (UN 2006). In this sense, the consideration of good practices is aimed at meeting basic needs, increasing the individuals’ self-sufficiency and providing opportunities for PwD to contribute to the family and the community through actions that, according to Unicef (s.f.), seek to:

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4. *The Spanish Judicial Dictionary* (DEJ), published in 2016, has been available online for free consultation since 2017 at the following link: <https://dej.rae.es/>



- **Promote the participation of PwD in all decision-making processes** in the provision of basic services such as water, sanitation, energy and transport, and ensure that related information is accessible.
- **Address stigma and discrimination** by transforming social norms regarding access to basic services and inclusion of PwD.
- **Raise awareness and discuss the rights of PwD** to access basic services and their specific needs when planning, implementing and evaluating initiatives with government and communities.
- **Take disability into account in the design**, monitoring and evaluation of basic development services interventions and in emergency situations. Disaggregate data by disability, identify bottlenecks [...], as well as provide solutions to them, and include disability-related indicators.
- **Design and construct** basic service facilities [in accordance with] universal<sup>5</sup> design principles so that they can be used by all persons, including those with disabilities. For example, in the case of water, sanitation and hygiene facilities, these

5. “Universal design is about devising products, environments, programs and services that can be used by all persons, to the greatest extent possible, without the need for adaptation or specialist design under (UN 2006) Article 2, <http://universaldesign.ie/Built-Environment/Building-for-Everyone/>” (footnote included in the original text).

must be physically accessible to persons with different types of disabilities. (Unicef s.f., 2) (the bold type belongs to the original text).

Among the difficulties encountered in carrying out this analysis is the fact that the collection of statistical data on access to public services for PwD is limited<sup>6</sup> and uneven in the region. Despite the recommendations for disability measurement promoted by the Washington Group<sup>7</sup> to standardize disability questions in censuses, the results of these censuses have not yet been compiled. In censuses prior to the 2017-2020 round in the region the questions associated with disability varied by country, therefore, according to ECLAC:

*“[...] the incorporation of questions on disability in censuses should take into account existing international recommendations, including those of the United Nations, the WHO and the Washington Group, and those of CELADE, to standardize instruments and obtain data on the number and living conditions of PwD that are comparable across countries and regions”. (ECLAC 2019, 35-36).*

6. [...] The lack of data on the incidence of disability becomes an excuse for not addressing the problem. Without reliable data on the situation of PwD, it is not only difficult to draw attention to their needs, but also impossible to determine whether inclusion strategies are effective (Mattioli 2008).

7. “The Washington Group on disability statistics is responsible for providing the necessary basic information on disability that is comparable globally and has worked with a number of agencies in different countries to develop guidelines to improve the collection and analysis of disability data” (Senado de la República de México 2018).

Some countries conducted the census in 2017 and 2018 following the above recommendation (Chile, Peru, Colombia and Guatemala), and others will conduct them before 2023. This means that unified statistics as instructed by the Washington Group so far are scarce. In addition, household surveys vary by country in their measurement of disability, making it difficult to have public and comparable information across countries. Four

countries in the region (Bolivia, Chile, Costa Rica and Mexico) took into account the recommendations made and use questions based on the Washington Group proposal.

To the extent that information is collected on PwD, it is possible to allocate resources and develop programs of care and accessibility to public services for the most vulnerable.



#### 4.1 Water and Sanitation Sector

In terms of coverage of drinking water services, in 2015 in Latin America and the Caribbean, 94.6% of the population had access to safe drinking water and 83.1% to improved sanitation (IDB 2017). Coverage levels vary from country to country, for example, Haiti has only 58% water coverage and 28% sanitation coverage, Bolivia is another country with the lowest percentage of sanitation coverage at only 50% (IDB 2017).

In terms of solid waste management, the average collection coverage in Latin America and the Caribbean is 89.9% of the population (Grau 2015, 1). Roughly 53% of the population in Latin America and the Caribbean is served 2 to 5 times a week and 45.4% have a daily frequency of collection. Solid waste disposal in sanitary landfills corresponds to approximately 55% of the population, which means that there is a high percentage

of waste that is not properly disposed of or treated (Grau 2015).

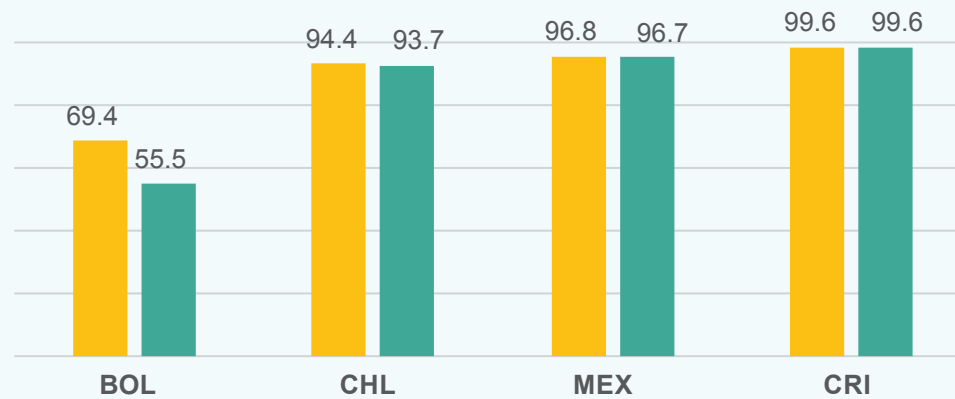
Article 1 of General Comment No. 15 on the right to water defines that everyone (ONU 2010) has the right to sufficient, safe, acceptable, physically accessible and affordable water for personal and domestic uses (iAgua 2019).

According to the UNICEF report on “Inequalities in sanitation and drinking water in Latin America and the Caribbean” it is reported that water and sanitation coverage for PwD appears to be similar to national averages (Unicef, Organización Mundial de la Salud, JMP 2015). Household survey data from four countries show that this statement is generally correct for the region. In countries where coverage is near universal, there are no significant differences in access to water and sanitation between households with at least one member with a disability compared with households without a member with a disability (Duryea, Pinzon-Caicedo y Pereira 2021).

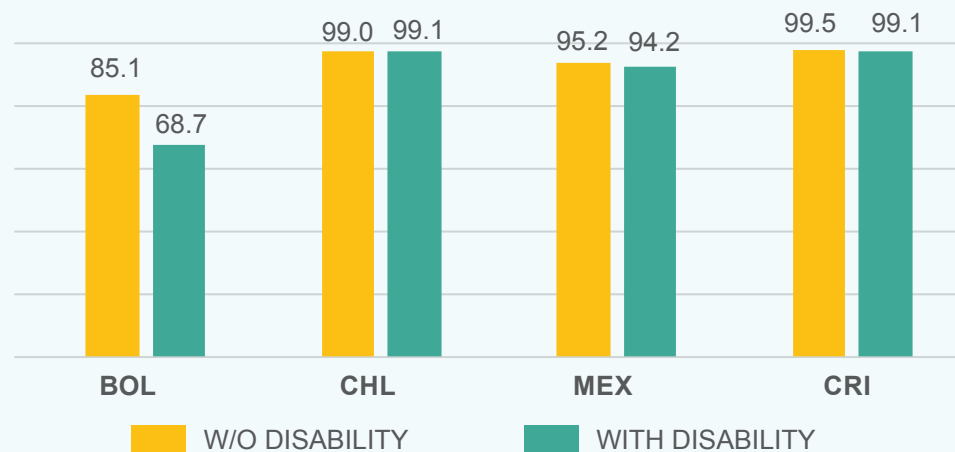
**Figure 1.**

Access to water and sanitation for households with and without a member with a disability

**Water** (Coverage %)



**Sanitation** (Coverage %)



Source: (Duryea, Pinzon-Caicedo and Pereira, 2022)

For PwD, as for the entire population, the fulfillment of the right to water is fundamental. Offering these services is a priority if we take into account that the lack of accessibility to water and sanitation services in the world produces diseases such as diarrhea, cholera or polio, among others (ACNUR 2019). External factors that prevent equitable access could be overcome through reasonable accommodation or universal design, at a much lower cost than the impact of affecting and excluding this population. In fact, estimates from developing countries suggest that when the accessibility of water, sanitation and hygiene facilities is taken into account from the beginning of the project, the additional cost to the project is only between 1% and 3% of the total cost (World Bank 2017).

Physical, social and communication barriers to accessing water, sanitation and solid waste services are presented below. Later in this section, good accessibility practices are presented with respect to the physical, communication and social environment.

#### 4.1.1 Physical Barriers

##### 4.1.1.1 Architectural Barriers To Accessibility

In urban areas, architectural barriers in built spaces for housing and service infrastructures (primarily economic, community and educational) include sanitary waste disposal and hygiene

difficulties<sup>8</sup>, such as toilets that are not accessible to persons with reduced mobility. This can lead to a lack of independence in self-care and personal hygiene, and difficulty with household chores such as washing dishes, housework and laundry. Barriers related to personal hygiene are associated with health effects and low self-esteem in PwD (White 2019). In addition to the above, the design of utensils, tools and devices for accessing water and their uses must be taken into account, which must be accessible to different PwD.

The above situations are aggravated in the case of PwD living in rural areas, where, in addition to the situations described above, the lack of adequate infrastructure for accessing water makes access to water difficult, as they have to carry it in buckets, bags or heavy items that are difficult for some PwD to carry.

#### **4.1.1.2 Physical (Architectural) Barriers to Accessibility In Urban And Rural Settings**

Barriers to water accessibility for PwD are related to mobility constraints for water collection in terms of **distance**; ideally, the water access point should be located within 1,000 meters of the place of residence (iAgua 2019). The state of conservation and

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8. This situation makes it very likely that PwD will soil themselves when going to the toilet and will not be able to wash themselves, which leads to greater rejection by society, low self-esteem and illness. This, in turn, has consequences for the family, which has to invest time in helping their family member with a disability, and reduce their time available for productive or leisure activities (López 2015).

maintenance of infrastructures (roads and water and sanitation points) generates risks for the transit and transport of water, as well as for the use of infrastructures. Also with road conditions (dirt roads) and difficulty of travel (steep slopes, roads obstructed by rocks, boulders and vegetation, slippery clay soil when wet), added to the type of disability and vulnerability (Binks, y otros 2012). A situation derived from the above leads the PwD to assume higher costs for the purchase of water and to spend more money to pay for the transport of water to the dwelling.

Other barriers to be taken into account are the **accessibility features of toilet and hygiene infrastructures** suitable for PwD related to mobility (toilets without architectural barriers). In addition, it is important to highlight the physical (safe and clean toilets) and social (personal safety) factors in access to toilets and showers to reduce the risk of sexual assault to PwD and vulnerable populations (children, adolescents, women and older adults). It should be noted that the barriers for PwD are similar and complementary to those of the above age groups and vulnerable groups in the community for which it is necessary to ensure inclusion and access to water for PwD, which allows addressing the different functional needs of access to the service for the vulnerable population.

Other related situations that arise relate to barriers that lead to the non-use of infrastructures, exposing them to illnesses that affect

their quality of life and forcing them to use it at times when they have no contact with other members of the community, which increases safety risks. In cases where the community does not have the infrastructure to access water sources, at least ensure that their quality is adequate for consumption and use to avoid risk in physical access, free from exposure to agricultural and industrial pollution (UNDP 2006).

With respect to the barriers that PwD have for the **handling and collection of solid waste and depending on the disability**, it can be difficult to carry the garbage bags to the containers or collection places due to their weight and the height of the containers, sometimes the garbage can be placed on the sidewalk interrupting the circulation which generates a barrier for movement. Depending on their condition, some persons may dispose of sharps, pathological or hospital waste that must be treated in a special way. The section on good practice explores the subject in greater depth.

#### 4.1.2 Social Barriers

In water and sanitation service delivery systems, there are social barriers for PwD with social and economic implications on their quality of life derived from the lack of access to these services, which affect their well-being and that of their families and communities. (Unicef 2019b). The conditions of use of utensils and tools for water access and

use must take into account the difficulties of PwD in terms of self-exclusion and social exclusion.

Persons with reduced mobility face greater difficulties in using facilities for accessing and using water (hand pumps, sinks or latrines) than persons with hearing impairment or intellectual disabilities. In addition to the situations of rejection by the community mentioned above, despite not having difficulties in getting around, other disability profiles may experience mistreatment or ridicule when using the service, making it inaccessible for personal safety reasons. The accompaniment and support of a family member is often required to use access facilities and water for self-care and hygiene, resulting in the loss of autonomy and independence of the person with a disability (Groce, Bailey y Lang 2011).

#### 4.1.3 Communication Barriers

PwD are excluded due to the limited **communication channels** of water and sanitation utilities, which do not offer a variety of communication options specifically created for persons with hearing, visual and intellectual disabilities. Practices that generate exclusion refer to the use of invoices with complex language, difficult to read typography and designs that are difficult to understand.



In addition, the web pages do not include information in videos, sign language or plain language. Sometimes customer service offices are not accessible or do not have trained personnel to serve PwD, the elderly or the poor who do not have the technology to access a website.

Within the statistics of the customer service channels of Empresa de Acueducto y Alcantarillado de Bogotá, Colombia, as of September 2019, it was observed that 47.15% of the contacts were made through telephone channels, 42.95% through face-to-face channels and 9.9% through written media (personal interview with Fonseca, Acosta and Camargo, from Customer Service of Empresa de Acueducto y Alcantarillado de Bogotá, November 26, 2019). Thus, it is clear that face-to-face and telephone communication are still the main channels, so it is necessary that the points of care are accessible and have trained personnel to serve a person with a disability.

Another factor to highlight is that, on occasions, the population does not have the necessary technology to receive virtual communications or invoices, so face-to-face client services are fundamental, in addition to the new technologies that can support accessibility through different means of communication (see box 1).

#### 4.1.4 Best Practices

##### 4.1.4.1 Physical Accessibility: Architectural Accessibility to sanitation systems

Good practices in physical accessibility focus on two specific areas:

1. Architectural accessibility of bathing and toilet facilities in rural and urban areas.
2. Accessibility in the treatment of household waste.

Aids for the use of bathing and toileting **facilities for different groups** of PwD in rural areas involve tools or items that support and facilitate the use of bathing facilities, water wells and hand pumps; they include benches, walkers and handholds for support and balance that facilitate the use and maintenance of clean and dry clothes (Jones 2005, 159,160,172).

To make latrines and hand pumps accessible to persons with reduced mobility (e.g. wheelchairs), actions such as adapting the approach paths, adapting the latrine and maneuvering spaces in the latrine cabin, installing the hand pump in a space accessible from the wheelchair, taking into account the safety and stability of the person while using the pump, are developed. Likewise, the height of the surfaces must be considered for the development of water supply, utensil washing, and self-care and hygiene activities. (Jones 2005, 154).

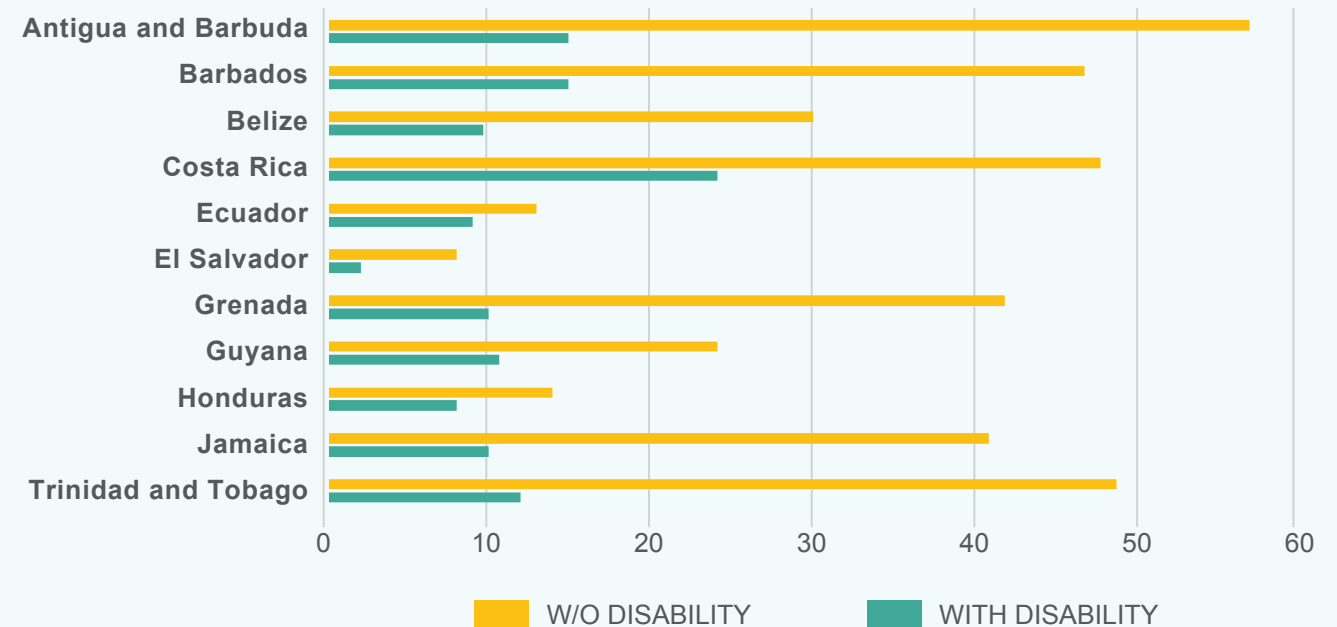
## Box 1. Internet Access

In LAC, the region's water, sewerage and energy companies, as well as public transport services, have expanded the functionalities available to users through the Internet. However, there are barriers for PwD to access the Internet.

Figure 2 above shows that there are differences in Internet use between persons with and without disabilities in the countries of the region. For example, 50% of households without any members with a disability in Antigua and Barbuda report using the Internet and less than 7% of non-disabled persons in El Salvador do so. It is also observed that households with at least one member with a disability use the Internet less than households without a member with a disability. The differences range from 4.4% in El Salvador to over 40% in Antigua and Barbuda (ECLAC 2018).

**Figure 2.**

Latin America and the Caribbean: Internet use in households with and without members with disabilities



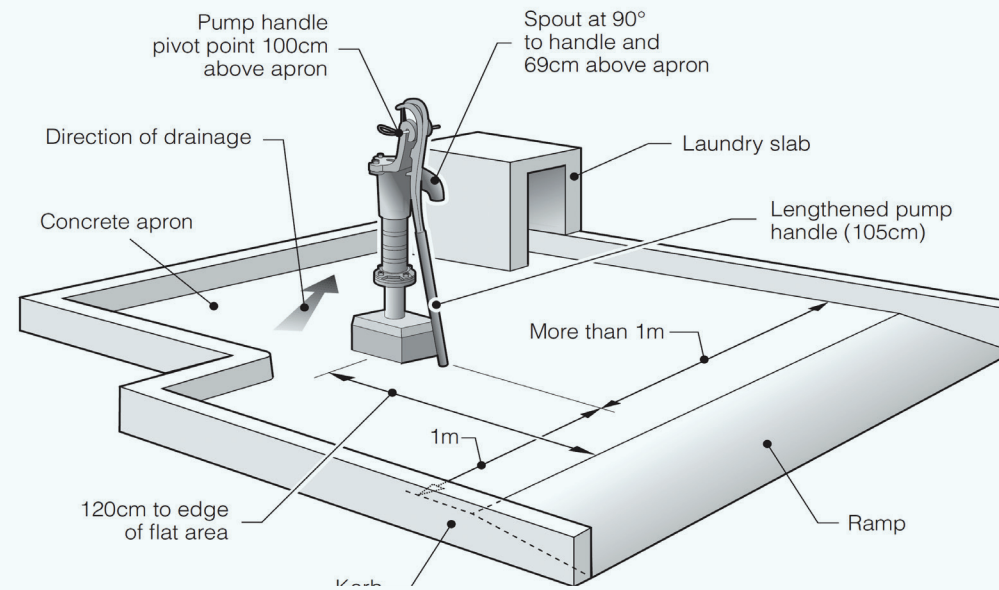
Source: (ECLAC 2018)<sup>1</sup>

1. ECLAC according to censuses of Antigua and Barbuda (2011); Barbados (2010); Belize (2010); Costa Rica (2011); Ecuador (2010); El Salvador (2007); Grenada (2011); Guyana (2012); Honduras (2013); Jamaica (2011); Trinidad and Tobago (2011). In Honduras and El Salvador, the census asks about possession of an email account. This variable is used as an indicator of Internet usage. This proxy probably underestimates the percentage of persons who use the Internet, since those who have email probably use the Internet, but not everyone who uses the Internet has an email account.



## Figure 3.

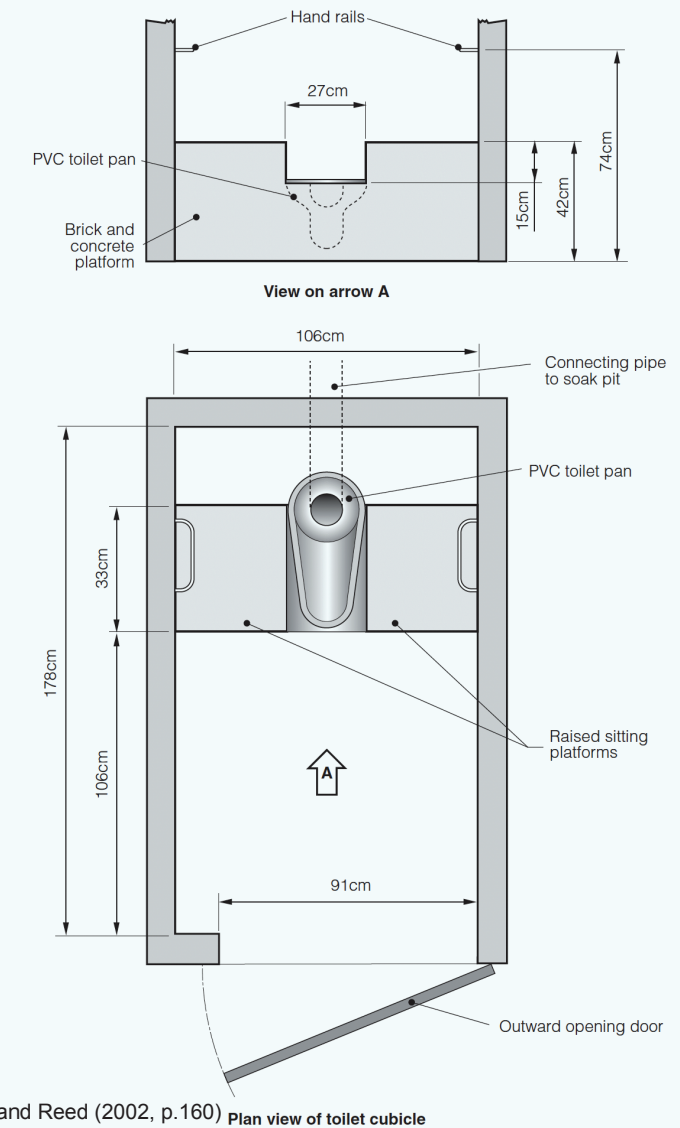
### Design of an accessible water pump



Source: Jones and Reed (2002, p.167)

## Figure 4.

### Latrine with raised platform



Source: Jones and Reed (2002, p.160) Plan view of toilet cubicle

For water storage and shower area for PwD with reduced mobility, the shower area should be enclosed by a tarpaulin, plastic, etc. The access dimensions should be at least 90 cm and inside there should be sufficient space for a turning radius of 1.5 m for the wheelchair. A fixed bench (made of concrete) is installed to which the person passes from their wheelchair. Rainwater is collected and stored for use in the toilet, the storage area for this rainwater should be accessible from the bench so that the person can bathe, wash clothes, clean hands (a sink is placed next to the bench so that the person can draw water from the storage container). Some sort of drainage system needs to be built to prevent the settling of dirty water which can then bring disease and make the toilet inaccessible (Jones 2005, 197,203).

Regarding the accessibility of toilets and sanitary facilities in urban areas, **it is recommended to consult** [Goodbye Barriers! A Guide to Design More Accessible Spaces](#) at the IDB. (Borau, de Moraes y Duryea 2019).

In relation to household **waste management, several cities** around the world - for example, Charlotte in North Carolina (USA) - have incorporated special services into the garbage collection system, so that the PwD does not have to go to a garbage container, but the service company collects the garbage directly from the yard or place of residence of the PwD in question. The requirements to obtain this special service are to fill out a disability form, receive a subsequent home visit and determine

the appropriate pick-up point (Charlotte Solid Waste Services 2019).

Furthermore, garbage bins have been designed in Spain that are adapted to all types of disabilities, with an opening less than one meter above the ground so that persons in wheelchairs can deposit waste. It also has a handle to open the lid and a Braille notice so that visually impaired persons can find out what type of waste they should deposit in each container. The containers have been developed in collaboration with the ONCE Foundation for the cooperation and social inclusion of PwD and Spanish cities such as Móstoles, Zaragoza, Badajoz, Mariñas, Vinarós, Santander and Pontevedra already have this type of containers (Planeta Recicla 2012).

In relation to sharps waste, medical centers usually have a sharps collection point, so patients can take sharps there. In the case of anatomopathological or hospital waste, cities should have special sanitary routes where this waste is collected in special plastic bags and treated in accordance with the city's environmental regulations.

#### **4.1.4.2 Social Inclusion**

To reduce the social gap of exclusion, understanding the needs of PwD must be improved. The goal is to meet basic needs, increase self-sufficiency and provide opportunities for PwD to

contribute to the family and community (Unicef 2019b). This can be done through:

- Inclusion of the specific needs of PwD in **access to and use** of water, sanitation and hygiene facilities and services;
- Advocacy and support for policy development and capacity building of water, sanitation and hygiene professionals to **provide a service that recognizes** and responds to the specific needs of PwD;
- **Disability-specific attention to water**, sanitation and hygiene programs in schools: Inclusive design of toilets and washbasins to meet the wide range of needs of children with disabilities;
- **Adequately consult** with PwD to develop and design water, sanitation and hygiene interventions in homes, institutions, hospitals, etc;
- Address **issues of self-reliance and dignity** of PwD in accessing water, sanitation and hygiene facilities and services;
- **Accessible monitoring, evaluation and reporting of water**, sanitation and hygiene programs, with special attention to

PwD (Unicef 2019b).

Another good practice of social inclusion in water, sanitation and wastewater services is institutional support to reduce service tariffs through **subsidies**. In Argentina it is possible to apply for the social tariff of public services for PwD. For this the certificate of disability is required along with a form to fill out, allowing access to the water social tariff (Gobierno de Argentina s.f.).

#### 4.1.4.3 Accessibility to Communication

To reduce communication barriers affecting PwD, it is necessary to increase the channels of communication and service delivery, accounts and billing of water and sanitation services (Unicef 2018) including printed, auditory, visual, sign language, Braille, among others. The World Bank (WB) recommends - according to each disability - actions to ensure inclusive communication for the population on water, sanitation and hygiene issues through different dissemination channels:

- Visually impaired population
  - Information (including alerts) in audio format (recorded messages, etc.) sent by cell phone. The use of recordings or cell phone alerts to provide utility information has been found to be helpful.

- Materials in Braille and large print, such as paper bills for service charges.
- Accessible website, WCAG 2.1 AA<sup>9</sup> standard, with legible and clear information that is also readable by screen readers such as JAWS that converts the information presented to voice allowing visually impaired persons to make autonomous use of the computer, cell phone and tablets.
- *Speech* recognition software and audio descriptions.
- Hearing impaired population
  - Sign language interpreters or subtitling, in institutional and corporate videos, and important information on the website of the service companies.
  - Text messaging SMS or use vibration/text alerts instead of audio alerts to send bill payments.
  - Voice and video relay services, professional sign language support through video call for customer service.
- Population with communication difficulties
  - SMS text messages.
  - Synthesized speech output and text-to-speech functionality.
- Population with physical disabilities
  - Text-to-speech playback through recordings for persons with reduced mobility in their upper limbs (dictation function with *Dragon voice recognition*, typing in *Google Drive*, *IBM Watson speech to text*).
- Population with intellectual disabilities
  - Text-to-speech playback and voice output.
  - Multimedia to aid understanding, e.g. videos, graphics and touch screen devices in customer service centers. (WB 2017, 31,32)

It should be borne in mind that effective inclusive communication should consider the development of a clear message that uses the visual and auditory resources that are most common and closest to the population (Ayuntamiento de Catalunya 2019).

9. WCAG is the acronym for Web Content Accessibility Guidelines. WCAG which are the web accessibility guidelines. These guidelines detail how accessible web content should be for PwD such as blindness and low vision, deafness and hearing loss, learning disabilities, cognitive limitations, psychomotor limitations and speech disabilities, among others (Vega 2018).



## 4.2 Energy Sector

The general context on energy consumption, statistics and aggregate energy indicators for Latin America and the Caribbean report that the largest energy expenditure is in the transport sector, followed by the industrial sector, the residential sector and then the agriculture, livestock, fisheries and mining sector, as shown (IDB-OLADE 2018) in the following table.

Table 2. Of energy expenditure by sector	
Sector	Energy consumption (Mtoe)*
Transport	237.00
Industrial	198.00
Residential	99.91
Agriculture, livestock, fisheries, mining, other or non-energy	67.48
Commercial and services	33.24

\* Mtoe: Million tonnes of oil equivalent  
Source: Olade (2018)

With respect to energy sources, 31% of the energy used is oil, followed by natural gas (34%), hydropower (8%), coal (6%), geothermal energy (1%), nuclear energy (1%) and other primary energy (19%). (sieLAC-OLADE 2018, 43).

The average access to electricity in Latin America and the Caribbean (LAC) is 97%, with the exception of Haiti, which has only 30% access. (IDB-OLADE 2018). This shows that the population with fewer resources “faces a situation of lack of access to modern energy sources (electricity, natural gas, LPG and kerosene) and/or a situation of “energy poverty”. (ECLAC 2013, 64).

Regarding access to clean cooking<sup>10</sup>, the region has an average of 86%, (10% less than access to electricity) so it remains a challenge for many countries, including four that have access rates below 50%<sup>11</sup>. There are roughly 88 million persons in the region without access to clean cookstoves, and 2 million without access to electricity. (IDB-OLADE 2018). Roughly 90% of the population without access to electricity lives in rural areas, and for these households the greatest challenges are in terms of physical access. (ibid.).

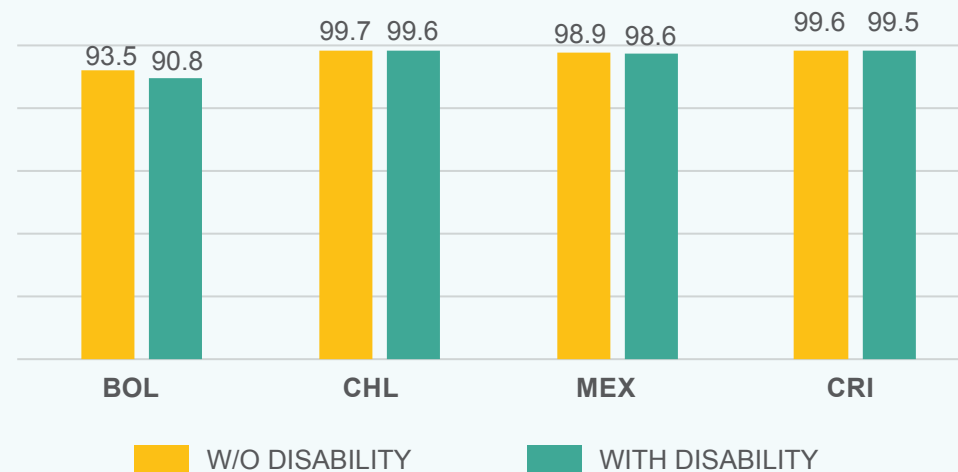
10. Cooking with clean fuels and culinary technologies

11. The countries with the least access to clean cooking technologies are Guatemala, Honduras, Nicaragua and Haiti

**Figure 5.**

Access to electricity for households with and without a member with a disability

Acceso (%)



Source: (Duryea, Pinzon-Caicedo and Pereira, 2022)

In the case of access to energy service by PwD, as with water service, there is little information related to PwD. However, recent household survey data from four countries in the region show that there are no major barriers to electricity access for households with a member with a disability (Duryea, Pinzon-Caicedo y Pereira 2021).

Energy is a fundamental resource for the personal and social development of the individual in any context of modern society. This is evidenced by the fact that this resource allows access to basic conditions of performance in society, such as information, efficient and inclusive work and citizen participation in the State. Added to this, according to a study by Sae Kajima (2017) for the United Nations Department of Economic and Social Affairs, PwD have greater energy needs and energy demand due to:

- The use of assistive technologies for independent living.
- The greater proportion of time these persons spend at home.
- The annual energy bill of families with a member with a disability is 50% higher than that of families without disabilities.<sup>12</sup>

In addition to this, Kajima (2017) argues that 80% of PwD live<sup>13</sup> in developing countries and a large proportion of them use rustic forms of energy in their homes, which can have negative impacts

12. There are a number of factors that lead to higher energy consumption in households with PwD. Among the needs that generate higher consumption are: the additional use of heating and lighting inside the home; the additional use of hot water for baths and showers; the additional use of washing machines, dryers and equipment such as dishwashers; the need to charge electric wheelchairs or mobility scooters; and the use of appliances, alarms, telecare and other aids and equipment in the home and outdoors (George y Lennard 2013).

13. 80% of PwD live in developing countries and have less access to electricity. Poor access to electricity poses specific problems for PwD who need assistive technology to live independently and participate in society. (Sustainable Energy for All Initiative 2017, Global Tracking Framework 2017 Progress Towards Sustainable Energy). (Kajima 2017).



on health (Kajima 2017). Particulate matter or PM2.5<sup>14</sup> smoke can enter the eyes or respiratory system and cause illness, such as bronchitis, and fine particles can worsen asthma symptoms. They can also trigger heart attacks, irregular heart rhythms, and heart failure, especially in persons who are already at risk for these conditions. (EPA 2017).

The physical, social and communication barriers to accessing energy services are presented below. Good accessibility practices in relation to the physical, communicative and social environment are presented below.

#### **4.2.1 Physical Barriers**

##### **4.2.1.1 Architectural Barriers To Accessibility**

With regard to architectural barriers to energy service, there are marked differences between urban and rural populations. These vary in the sense that the urban population that has access to the service, depending on the disability, requires specific adaptations in the architectural space (for example, in the kitchen to guarantee their independence and safety)<sup>15</sup>, while for the rural population the challenge is greater because a large proportion of persons must use firewood as a source of energy. Although the LAC region has the highest overall electrification rate in the developing world

14. This occurs primarily in low- and middle-income countries in South-East Asia and the Western Pacific regions (OMS 2018).

15. These adaptations are primarily made for the physical motor disability profile.

(94%), more than 30 million persons lacked electricity in 2011. At least one third of the rural<sup>16</sup> population in LAC still lacks access to electricity (ECLAC 2013).

A wood-burning stove, in addition to presenting greater difficulties for persons with reduced mobility or vision due to the effort involved in acquiring the wood which is not only always available on the market but which must also be cut down for its use, and due to the logistics involved in its burning, also poses a health risk to the inhabitants of the house due to indoor air pollution (A. y. Levy 2019). The WHO estimates that indoor air pollution caused 4.3 million deaths in 2012 in households where coal, wood and biomass stoves are used (Organización Mundial de la Salud 2014). Below is a breakdown of the percentage of deaths due to diseases related to indoor air pollution.

- 34% - stroke;
- 26% - ischemic heart disease;
- 22% - chronic obstructive pulmonary disease;
- 12% - acute lower respiratory tract infection in children; and
- 6% - “lung cancer” (Organización Mundial de la Salud 2014).

16. The rural population in Latin America is estimated at 120.6 million persons and in the Caribbean at 3.8 million. (Organización de las Naciones Unidas para la Alimentación y la Agricultura 2019).

In addition, isolation of power supplies prevents the PwD from using electrically charged items, for example, to charge the batteries of an electric wheelchair, an electric oxygen respirator, eyeglasses, hearing aids, communication devices, memory devices, prosthetic and personal assistive devices, or other supportive devices. The Global Alliance for Assistive Technology states that more than one billion persons in the world need at least one form of assistive technology. Assistive technologies include the systems and services required for assistive products that enable PwD to become more self-sufficient. Currently, more than 90% of persons who need assistive technologies do not have access to them. Assistive technologies are in greater demand among PwD, which in turn generates greater demand for access to electricity (Perera 2019).

#### **4.2.1.2 Urban and Rural Accessibility Barriers**

The public energy service also presents some physical barriers related to the infrastructure of the service networks at the urban and rural levels. The provision of public services in rural areas is also more complicated than in urban areas, owing to the costly infrastructure investments required and the low density of occupation in these areas; access to energy is much more restricted.

In addition, in urban areas, street lighting is an essential service for PwD and communities in general, as it contributes significantly

to road and citizen safety. Incomplete lighting at night, in addition to increasing the crime rate, increases the risk of accidents, (Domínguez 2019) especially for persons with reduced mobility and vision, as obstacles (such as holes, potholes, stones or unevenness) become more difficult to identify, both for vehicle drivers and pedestrians. In addition to the need for powerful lighting, the type of light is also an essential factor when it comes to accidents. The incandescent lights used over the past decades in most Latin American cities have a harmful effect due to the glare they generate, especially in the eyes of persons with reduced vision; this phenomenon causes a loss of the ability to react for a few seconds longer and poses a greater risk to passers-by. It is therefore advisable to install LED lights, which are not only more efficient in terms of energy consumption, but also produce an adequate and constant amount of light and reduce the glare caused by traditional lighting systems (Sandwood 2018). In addition, the lack of urban lighting on roads creates insecurity and a high risk of not seeing changes in level or obstacles on the sidewalk, or the signaling of crossings, which can lead to fatal accidents. Without good street lighting, the likelihood of accidents, theft and being run over is at its highest. All these issues limit the autonomy of PwD, making it difficult for them to travel independently at night.

The inadequate location of energy infrastructure in public space can be a barrier to PwD, as the physical infrastructure of this public service must most often be located on sidewalks and in



parks (in the case of light poles or electrical substations). Poor urban design can make energy provision a barrier to mobility for persons with physical and sensory disabilities, as well as for all pedestrians, when not enough effective space is left to move on the sidewalks (Murad Rodríguez 2018).

#### 4.2.2 Social Barriers

For their part, access to energy in household places such as the kitchen represents a risk in communities that use traditional means of cooking, such as firewood. According to the *German Technical Cooperation* (GTZ), “in many areas, especially in low-income areas, wood, charcoal, crop residues, dung or other types of solid fuels or biomass are used for cooking and heating, which generate high rates of indoor air pollution” (Johnson 2019), taking into account that PwD tend to spend a much higher proportion of their time at home this population has a greater need for modern cookstoves that ensure low emissions and access to clean energy for this daily activity (Kajima 2017).

#### 4.2.3 Communication Barriers

There are differences between rural and urban areas in terms of the main barriers faced by PwD with respect to energy service. In rural areas, the main barrier is the lack of access to the energy service resulting in the exclusion of communication systems, specifically: “Internet, social networks, health services

(telemedicine), distance learning, employment, networking and the opportunity to participate in global discourses” (Gogo 2017). Lack of energy access in rural areas excludes PwD, and others, from participating in a global, connected world.

In urban areas that have energy service, communication barriers arise from the lack of communication and customer service channels offered by the companies that provide the service (consumption measurement, billing, payment or customer service).

The most common barrier, and which most immediate progress needs to be made, is the way in which the service provider informs the user of their consumption and the amount to be paid. Since disabilities are diverse, it is necessary for the service provider to issue invoices according to the needs of each person (in braille, electronic invoices accessible to document reading programs, by text message, *whatsapp*, by virtual and physical means). This support must be provided at no additional cost to the user. In addition, payment of such invoices should be possible through multiple channels (see Table 1).

Furthermore, the channels of attention to complaints and claims must receive requests, both by telephone or written means such as *whatsapp*, and must also have the appropriate physical infrastructure in the company’s points of attention. In this case, each country has accessibility standards for customer service

points, with which it must comply. These rules include the construction of access ramps, signage, reception, waiting area, preferential attention lines, accessible corridors, parking areas for PwD, among others.

Another barrier that requires greater attention is the control of consumer spending. In some countries there is a policy of suspending service to customers who are frequently late in paying their bills or who do not pay, or they are installed with prepaid meters where service is only provided for the amount prepaid<sup>17</sup>; this means that there may be periods of time when the customer does not have access to the service. For PwD, the cut in service can affect their autonomy, and in the worst case can pose a direct risk to the health and welfare of the person and their family and/or those resident with them in the place where they live, so different approaches to non-payment by PwD need to be addressed.

#### 4.2.4 Best Practices

Examples of good practices are presented in which there is evidence of actions that allowed the elimination or reduction of barriers faced by PwD, these good practices are oriented to architectural accessibility, accessibility in customer service

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17. Empresas Públicas de Medellín (EPM), generated a prepaid energy service for which its value must be paid in advance and its supply, in case the charge runs out, the customer can send a text message to the company with the number of their meter and immediately receive a text message with the PIN number worth \$2,000 pesos COP to enjoy the service again (Empresas Públicas de Medellín [epm] 2016).

and inclusion; examples of subsidies for the payment of energy services for PwD are also presented.

##### 4.2.4.1 Architectural Accessibility

In search of clean **energy stoves that avoid indoor air pollution**, the IDB launched an innovative project in Guatemala to promote the efficient use of firewood and alternative fuels.

*It is expected to install at least 225,000 stoves and achieve a reduction of almost 50% in the consumption of firewood in beneficiary households, as well as an average annual saving of US\$ 360 per family. Similarly, in Honduras, Proyecto Mirador has installed more than 90,000 efficient cookstoves since 2004, displacing the equivalent of 2.9 tons of carbon dioxide per year. (Johnson 2019).*

These types of initiatives provide important health benefits by reducing particulate matter or PM2.5 in homes. Especially beneficial for persons whose disabilities affect their breathing capacity.

Increased use of **solar energy** in the region can also benefit PwD in two ways. Solar energy production can reduce the energy access gap in rural areas, benefiting PwD. An example of this was the initiative of Accion, Fundación Paraguaya and *Barefoot College*, three entities that joined forces to send a group of 50

PwD to India for a semester to learn how to produce energy in a rural village and increase their development possibilities. Furthermore, the use of efficient batteries for storing the solar energy generated would reduce costs, which would benefit one of the biggest consumers: households where PwD live. The production of solar energy has increased considerably with respect to one of its main challenges: the storage of the energy generated. In Australia, trials are underway with batteries that can solve this challenge and the selected households where these devices will be installed are those with PwD (Coggan 2019).

#### 4.2.4.2 Accessibility in the urban environment

There is a great diversity of guidelines for universal accessibility in the urban environment. Each country has implemented decrees and standards specifying aspects such as the materials allowed for the construction of sidewalks, the design and slope of ramps, the height of curbs, the effective width of sidewalks, the location of lighting, among others<sup>18</sup>.

In the various developments of public space in cities in the Latin American and Caribbean region, many sidewalks may not meet the minimum width of 1.2 meters. In these cases where it is not possible to have a circulation strip and street furniture, it is

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18. Each country has a list of its own technical standards on the development of urban space. For a recommended guide to accessibility, see *Goodbye Barriers! A Guide to Design More Accessible Spaces*, (Borau, de Moraes y Duryea 2019) AN IDB publication,

necessary that poles are not placed in the middle of the sidewalk and become obstacles in a reduced circulation space. For new infrastructure projects, it is recommended to require optimal standards for sidewalks with a pedestrian circulation strip of at least 2 m and an ideal width of 3.5 m, as well as a furniture strip of 0.6 m with an ideal width of 4.4 m (Secretaría Distrital de Planeación de Bogotá 2018). For more information on accessibility in the urban environment, we recommend consulting [\*Goodbye Barriers! A Guide to Design More Accessible Spaces\*](#) (Borau, de Moraes y Duryea 2019).

#### 4.2.4.3 Accessibility to customer service

An example of good practice in customer service and accessible communication is provided by Movistar Argentina, which offers its customers advice on cell phones according to the requirements of the person with a disability. To do so, it has classified mobile devices by accessibility criteria, offering 7 types of interaction: Low or no vision, low or no hearing, moderate or severe difficulty in manipulation and difficulty in comprehension. In this way, the user with a disability can identify the phone that suits his needs. In addition, they offer the option of requesting the invoice in Braille for customers who require it at no additional cost (Movistar s.f.).

It is also relevant to refer to cases on the European continent, where extreme weather conditions due to seasonal changes have led governments to take measures to ensure service to PwD.

In England, for example, the “*Equality Act 2010*”<sup>19</sup> was passed, a law that aims to punish discrimination against PwD by public service providers. Through this law, energy companies are required to guarantee accessibility to this population in order to avoid disadvantaged situations. This implies providing the billing service as required and avoiding the suspension of the energy supply due to non-payment, which forces the companies to look for alternatives to avoid the risk of the PwD not having the service supplied (Citizen Advice 2019). Some PwD need energy to survive, for example, they need respirators to be able to breathe, which shows the importance of this regulation.

Customer service inclusion efforts have also been seen in Colombia. In the country, some energy providers have initiated actions to adapt the physical infrastructure of their customer service centers. The adaptation included access ramps, modules for customers with reduced mobility and accessible toilets, as well as signs in Braille. In addition, providers have made efforts to train customer service professionals in the provision of accessible and adapted services.

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19. Part 3, section 29, provision of public services, determines the obligation of a provider to provide services without discriminating against the person requiring the service (UK Government 2010).

#### **4.2.4.4 Energy bill payment subsidies**

To contribute to the equity of PwD, governments can implement subsidy or assistance schemes on their energy bills. In Ecuador there is a subsidy for PwD through which they are exempted from paying 50% of the value of electricity consumption. This grant is intended for PwD who are account holders or who have a legal representative. It is also aimed at non-profit institutions that serve PwD (Gobierno de Ecuador 2019). Likewise, in Buenos Aires, Argentina there is a social tariff for gas and electricity, in the case of electricity the payment is reduced by almost half according to the kWh consumption compared to the full tariff (Gobierno de Argentina s.f.).



### 4.3 Transport Sector

According to the World Report on Disability

*[...] PwD often point to transportation as one of the barriers to accessing health care, especially when they live a long way from health facilities. Transportation for PwD is often limited, unaffordable and inaccessible. (WHO - WB 2011, 80-81).*

The dimensions related to social exclusion in transport systems are associated with physical exclusion, which refers to the physical barriers present in the design of vehicles, public space, streets, stations, stops, as well as communication barriers. It also refers to economic exclusion, which is related to the cost of public transport services, the value of which may increase depending on the number of journeys and modal integration. There are also exclusions due to scheduling requirements, lack of connection between routes, interchanges or services, and lack of route safety (Martínez 2012).

Regarding transportation in the region, CAF's Urban Mobility Observatory states that collective transportation predominates in

fourteen (14) of the twenty-nine (29) cities analyzed<sup>20</sup>. Individual motorized transport accounts for the majority of trips in eight cities and non-motorized transport predominates in seven of the cities analyzed (CAF 2016, 13-14).. Most public transport journeys are made on standard buses, followed by minibuses and the metro. Most individual journeys are made by car (CAF 2016). The standard bus (65 million trips per day), the metro (15 million trips per day) and minibuses (18 million trips per day) are the vehicles used for the majority of trips in the cities analyzed (CAF 2016).

In general, no data has been found on the accessibility of the bus fleet in the cities of the region, except in some particular cases. For example, in Brazil, according to a study on the accessibility of the bus fleet, it was identified that only 197 municipalities in the country, corresponding to 11.7%, have adapted bus fleets. Another 820 municipalities (48.8%) have a partially adapted fleet and 662 municipalities (39.4%) do not have an adapted fleet (Instituto Brasileiro de Geografia y Estadística [IBGE] 2017). In Costa Rica, the Ombudsman's Office carried out a verification of the accessibility of buses and a total of 103 buses were inspected in different regions of the country. Of these, 101 buses had ramps, i.e. 98%, and 2 had no ramps, i.e. 2%. However, of the buses

20. The cities analyzed by CAF's Urban Mobility Observatory were: Sao Paulo, Santiago, S.C., Sierra, San José, Salvador, Rosario, Rio de Janeiro, Recife, Quito, Porto Alegre, Pereira, Panama, Montevideo, Monteria, Medellin, Manaus, Lima, Leon, Guadalajara, Florianopolis, Curitiba, Mexico City, Caracas, Cali, Buenos Aires, Brasilia, Bogota, B Horizonte, Barranquilla.



that had ramps, 23% did not work. (Periódico El Mundo 2015). In addition, with respect to mass transit systems such as metro, BRT (Bus Rapid Transit), or Tramway, being robust systems, they consider accessibility guidelines in their infrastructure in accordance with the accessibility guidelines of the World Bank<sup>21</sup> and ITDP (Institute for Transportation and Development Policy)<sup>22</sup>. This means that it could be said that these systems are based on accessibility standards, but specific measurement studies are needed to determine the degree of accessibility of these systems.

Universal accessibility to public transport in the countries of the region varies according to the type of transport system in each city. In that sense, more modern systems such as BRT (bus rapid transit), cable, streetcar, subway, and enhanced bus systems can have a higher degree of accessibility<sup>23</sup>. To explore this aspect, the IDB created the Customer Journey Map (CVM)<sup>24</sup> methodology to qualitatively characterize the public transport travel experience of various user profiles, including PwD<sup>25</sup>. So far the evaluation has been carried out in four cities in the region (Bogotá, Santiago

de Chile, Medellín and Curitiba) which were assigned a travel satisfaction score according to the degree of accessibility of each system (D. C. Hidalgo 2019). It is necessary to promote these types of audits and accessibility measurements in public transport systems in the region in order to implement improvement actions. Currently, many PwD have to resort to using individual transport systems, such as taxis, due to the lack of accessibility of public transport systems. This is evidenced in the study conducted by the Pedagogical and Technological University of Colombia in Tunja, where it was established that 63% of the PwD use the taxi service due to the lack of accessibility to the public transport system (Poveda D Otero, Marquez Díaz y Monroy Peña 2017). Similarly, in the Dominican Republic, employed PwD spend between 37% and 40% of their salary on taxi transportation due to the lack of accessibility to public transportation. (ASODIFIMO citado por Diario Libre 2018).

The following is a list of physical, operational, communication and social barriers that are present in public transport systems that affect their accessibility. Thereafter, good practices that have reduced these obstacles are presented.

#### 4.3.1 Physical Barriers

The urban and architectural space of Latin American cities presents a series of physical barriers that impede the safe movement of PwD. Despite legal determinations at the global and

21. <https://siteresources.worldbank.org/DISABILITY/Resources/280658-1172672474385/BusRapidEngRickert.pdf>

22. [http://mexico.itdp.org/wp-content/uploads/BRT-Guide-Spanish-complete\\_unlocked.pdf](http://mexico.itdp.org/wp-content/uploads/BRT-Guide-Spanish-complete_unlocked.pdf)

23. That is, if they comply with World Bank guidelines and local transport accessibility standards <http://documents.worldbank.org/curated/en/298071532702503232/Bus-rapid-transit-access-guidelines>.

24. Evaluations are available for [Bogotá](#), [Santiago de Chile](#), [Medellín](#) and [Curitiba](#)

25. The user profiles evaluated in the application of the MVC methodology are: physical motor disability, visual disability, hearing disability, cognitive disability, persons over 65 years old, caregivers and persons with temporarily reduced mobility.

national level, and due to the lack of monitoring of accessibility standards, it is necessary to implement projects of reconstruction or adaptation of urban space to remove barriers. In the mass transport systems recently built in the region, the universal accessibility guidelines promoted by the World Bank (WB) and the IDB were applied. The guidelines have not only focused on transport vehicles, but have also included the urban environment. The guidelines have focused on the characteristics of the station, the crossing over the track and the characteristics of the bus. Likewise, the guidelines are oriented on both the trunk line and the feeder line (Rickert, BRT Accessibility Guidelines 2007). However, barriers that refer to public space - such as lack of ramps at sidewalk corners, poor quality of sidewalk surfaces with strong undulations, obstacles and obstructions on the ground, low permeability, lack of road safety, lack of signage, lack of lighting, lack of maintenance, conflicts between pedestrians and cyclists, among others - persist in urban space and are often the main cause of inaccessibility to the public transport system (TfL, Transport for London 2006).

To solve the problems generated by physical barriers in the urban environment and transport, it is possible to apply the concept of “universal design”, understood as “the design of products and environments suitable for use by the greatest number of persons without the need for adaptations or specialized design” (NC State University 2008). In this sense,

*[...] universal dimensions of access should: (a) recognize the social context, (b) consider the person’s situation, (c) take age and cultural factors into account, and (d) support analyses in relation to the person and the environment. (D. C. Hidalgo 2019, 3).*

It is a comprehensive approach to the development of inclusive cities in which universal design<sup>26</sup> is included from the conception of the projects.

In rural areas, transportation is much more limited, there is less road safety and barriers are more pronounced, which significantly affects the quality of life of PwD resident in rural areas. Many rural persons in developing countries lack adequate and affordable access to transport infrastructure and services. In rural areas there are contrasting aspects of rural transport services due to different areas and situations that have unique characteristics and make comparison impossible<sup>27</sup>. The type of vehicle also varies, they can be tricycles, motorcycles, bicycles, animal-drawn vehicles, trucks, vans, buses and minibuses. Many of the above are not accessible to PwD. Within the range of operators, not

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26. The 7 principles of universal design are: equitable use, flexible use, simple and intuitive use, perceptible information, tolerance of error, minimum physical effort, adequate size and space for access and use. (Fundación Sidar 2007).

27. The characteristics of rural transport depend on the population and income, the type of transport, and the areas through which it travels. Population densities and their income levels affect transport supply and demand; whether they are low-density, low-income areas, medium-high density, low-income areas, or low-density, high-income areas.

all have a fleet of accessible buses. In these cases, rural PwD travel in whatever vehicle they can find, despite the personal insecurity this represents and the implications for their autonomy (International, Access Exchange 2017).

#### 4.3.2 Operational Barriers

Bearing in mind that public transport systems provide a different service to those mentioned in the previous chapters on water and energy, in the case of transport it is necessary to refer to operational barriers, i.e. those related to the operation of the service (fleet of buses, drivers, etc.). In many cities in Latin America and the Caribbean, the commitment to have a fleet of accessible buses is still not being met. In Brazil, Decree 5296 established that by 2014 the fleet of collective road transport vehicles and the infrastructure of transport services should be accessible.

A similar situation exists in Colombia, where there is a regulatory framework (Statutory Law 1618 of 2013 and Resolutions 3753 of 2015 and 4200 of 2016) that determines as mandatory that the fleet of metropolitan, district and municipal public service buses be accessible by 2023, however, several unions have pushed for a new deadline (Londoño 2017). Carriers oppose further investment in bus bodywork to increase accessibility as this would have a cost overrun, ignoring that the regulations generally stipulate as limit for full accessibility a date by which

the fleet should be completely changed; calling for new buses to be fully accessible, which would not imply a higher cost.

In addition to the lack of vehicle accessibility, there are also other operational barriers in the transport systems, such as insufficient options for recharging the balance of the transport card physically and online, the lack of a protocol for safe driving and operation of the bus ramp (when it exists), as well as a protocol for care and assistance to PwD at stations and inside the bus (D. C. Hidalgo 2019).

#### 4.3.3 Communication Barriers

In the case of transportation, there are several communication barriers that make systems inaccessible and difficult for PwD to use. In the IDB's evaluation of Customer Journey Maps, the predominant barrier identified was the lack of an **activated announcer and visual information** inside the bus announcing routes and forthcoming stops. Similarly, in evaluations of this methodology in the cities of Curitiba, Bogotá, Medellín and Santiago de Chile, cognitive, visual and auditory profiles commented on the insufficient information provided at bus stations and bus stops. The lack of visual and auditory information was especially evident in the use of shuttle buses (D. C. Hidalgo 2019, 30).

Communication in transport systems needs to include sign language or subtitled videos, Braille or documents accessible to



screen readers, simple videos and signage associated with the public transport system, among others, as well as appropriate mobile applications so that PwD can plan their journey in advance. In the UK, Transport Focus carried out research looking at the travel experience of PwD, their results show that PwD feel more anxious during the journey, so they plan very carefully and need more detailed information about the facilities and circumstances of the journey, especially where they can (or cannot) find toilets, lifts and accessible environments (Transport focus 2018). In this respect, access to the Internet for PwD is particularly relevant (see Box 1).

#### 4.3.4 Social Barriers

In the transportation system, attitudinal barriers and lack of empathy for PwD make their journey even more difficult. An example of this is the discrimination against PwD in the transport system when drivers do not stop the bus to pick them up, sometimes they also drive aggressively and do not give the PwD time to get on the bus, leading to the risk of falling while the bus is in motion. Among the testimonies of this lack of empathy is that of a young man who was insulted using his wheelchair on a road dedicated to cyclists:

*That day I had to ride on the [dedicated bike route], because [the sidewalk] was in very bad condition. As she was taking me along this route, cyclists started whistling at us. She was*

*surprised and I, because I was used to it, explained that it was normal, because we were using the area that they think is exclusively theirs. She wanted to argue with them, but it wasn't worth it, as it happens all the time (Murad Rodríguez 2018).*

Another example is the testimony of a public transport user with reduced mobility who says “I have to lean on my cane, calculate the time and then the driver is already trying to step on the accelerator. He yells at me “come on ma’am, get off” or he doesn’t even yell, he doesn’t say anything and starts moving” (Olivares et al., 2019) (D. C. Hidalgo 2019b).

#### 4.3.5 Best Practices

##### 4.3.5.1 Physical and Operational Accessibility

In the city of La Paz (Bolivia), **the Mi Teleférico system** was conceived in 2011 to provide a public transport solution to the cities of La Paz and El Alto, both of which are conurbations and dependent on each other. The rugged geographical location of the cities required an innovative solution<sup>28</sup>, so they decided to use the cable car system that had already been used previously in the city of Medellín (Colombia). However, since its creation, Mi Teleférico has incorporated transformative and socially effective

28. La Paz is 3,640 m above sea level, while the city of El Alto is 4,150 m above sea level. This topographic difference for a bus system is a major obstacle because steep slopes and informal urban development in El Alto have created narrow streets that some buses cannot transit.

ideas, becoming a system with the capacity to provoke profound urban transformations and changes in society's perception of a public transport system.

Accessibility has been one of the pillars in the development of Mi Teleférico, currently the system has 10 lines (red, yellow, green, blue, orange, white, light blue, purple, brown and silver), 26 stations and a total of 30.5 km constructed. In addition, the system has a preferential card for PwD, senior citizens and students, who pay 50% of the established conventional fare. However, in the time span between May 2014 and March 2018, only 0.03% of trips were made by PwD<sup>29</sup> (Dockweiler 2019), which could be indicating barriers to mobility that go beyond the accessibility of the transportation system.

PwD have assistance from the moment they enter the station, the operators inform the cabin of the entry of the person and the speed of the cabin slows down for boarding accompanied by an operator who arranges the chairs to give more space to the disabled user and asks for the destination station. Once the passenger is on board, the operator communicates by radiotelephone with the end station personnel to receive the passenger. The cabins are also equipped with loudspeakers, cameras and a panic button. In addition, public spaces and sidewalks are being built around

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29. This figure is important because few cities in Latin America collect data on the movement of PwD. It is necessary to start including this information on trips made by PwD in city mobility surveys, so that the reasons for the low percentage of trips made by PwD can be identified.

Mi Teleférico stations, which will be equipped with ramps, tactile slabs and signage. Stations have elevators, lockers and accessible restrooms.

Ideally, 100% of public service vehicles should be accessible. However, few cities have achieved that goal. London, for example, is one of them. The entire fleet of London's iconic taxis have small, easily deployable ramps and drivers are trained to provide the service. That is the ideal standard. Most cities are still far from this and have only a small number of accessible vehicles. This service is known as Specialist Transportation Services (STS) or Paratransit. These services are another alternative to provide subsidized specialist transportation for PwD with severe mobility limitations. In paratransit services, routes are scheduled according to the needs and schedule of the user, picking them up at home, taking them to their destination and returning them home. The advantage of the paratransit system is its ability to respond to demand. One example of a paratransit system is ACCESS in the city of Curitiba, a specialist transportation service for PwD to get to medical appointments efficiently and safely (Moraes 2019).

In **rural environments**, where roads are built, laid or rehabilitated, it is important to include accessibility standards. Road accessibility and construction standards bring benefits such as accessibility to markets and rural job opportunities, reduced travel times and transport costs, as well as increased documented access to basic

services such as health and education. Studies in Nicaragua, Mexico and Peru have found significant relationships between different road indicators and rural non-agricultural employment opportunities. In addition, the deterioration of rural roads has a major impact on access to health care and this directly affects PwD in rural areas. (Escobal 2002). Another study in Morocco identified links between rehabilitated road infrastructure and access to education, especially for girls, as well as a substantial increase in the use of public health services (H. Levy 1996). These benefits have an impact on disabled persons' access to health services and employment opportunities.

#### 4.3.5.2 Communication and Technology Accessibility

Transport for London (TfL) has a very comprehensive and accessible user **communication** strategy. The technology TfL uses supports communication in the knowledge that customers are accessing information in increasingly varied ways: “75% of Londoners use the internet for maps or directions, 76% access live public transport information and 62% make daily travel plans online” (Elvery 2016).

Knowing its customers is very important to TfL, which is why it has adopted a consistent and diverse communication strategy. Its communication premise assumes a unified, human, predictive and customer-centric communication that works 24 hours a day and is inclusive of all types of users and needs. The **accessible journey**

**planner** provides mapping, signage and orientation information, as well as audio and visual information in real time. Selecting “accessibility and travel options” displays information about stairs or escalators, the type of transport that can be used and the distance to walk. It also informs you if there is a gap between the platform and the train, and you can select step-free routes to the train, bus, etc.

Stations and bays are **signposted** so that everyone can find their way around and “step-free”<sup>30</sup> routes have recently been created. All stations have sound announcements. Most also have electronic signs on platforms and in ticketing lounges showing the times and destinations of forthcoming trains. In addition, all metro station lobbies have service update panels. Live arrival information is available online. Bus arrival information is available on the app, as well as 2,500 countdown panels at bus stops showing which buses are arriving and when the next buses will arrive.

On board, all buses have audible and **visible announcements** indicating the name of the stop, the route and the destination. Finally, communication and customer support channels are diverse and accessible, there are 300 applications with open data technology and unified API, 30 datasets available to more

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30. As of February 2020 there are 79 Underground stations, 60 surface rail stations (London Overground) and 23 stations on the rail service that have step-free access. All Docklands Light Railway stations are step-free. (Transport for London s. f.)

than 6,000 developers (Elvery 2016). This has enabled the development of applications that make it easier for PwD to navigate the city. In addition, open data facilitates the storage and visualization of databases by governments, journalists and civil society, which strengthens the dialog on accessibility at the local level<sup>31</sup>.

#### **4.3.5.4 Campaigns for empathy and respect for People with Disabilities**

31. With open data, in England there has been training for Underground and bus support staff, innovative real-time digital information with *iBus*, roughly 1.8 million social media followers and *Wi-Fi* at 250 London Underground stations and *Victoria Coach Station*, as well as 79 Tube stations.

In the city of **Curitiba**, Brazil, multiple campaigns have been carried out with the aim of providing guidance on inclusive attitudes, highlighting the importance of behaving appropriately and respectfully towards PwD (Ayuntamiento de Curitiba 2019). In addition, the Coordination of the Rights of Persons with Disabilities offers lectures and training to municipal employees through activities that seek to promote inclusive care in the municipal public service, recreating the limitations and difficulties faced by PwD in everyday tasks (Coordinación de Personas con Discapacidad 2019).

Once the barriers and references of good practices in the public services of water and sanitation, energy and transport have been studied, the conclusions related to their accessibility are shown:

- **Follow-up on compliance with physical and architectural accessibility standards.** All 26 IDB member countries have ratified the CRPD and these countries have legislation and standards for accessibility and inclusion (in areas such as health, education, employment, transport and leisure). The next step is to monitor compliance with these standards more closely. Especially in relation to physical accessibility and the construction of infrastructures, since architectural and urban adaptations are costly. If regulations for new projects include accessibility standards, they will be more effective without incurring prohibitive additional costs. In developing countries, the cost of affordable water, sanitation and hygiene facilities is often less than 3% of the total project cost - a small investment with huge benefits for all (World Bank 2017). Likewise, evidence suggests that if accessibility standards and elements are included in transport infrastructure projects from the

## Conclusions

planning and design stage, the cost is between 3% and 5% of the total project, much less than for adaptations to existing projects (Restrepo 2019).

- **The need to collect information on users with disabilities.** This report has collected available and specific statistics on the provision of public services (water, sanitation and energy) to PwD; the analyses that can be drawn from this information relate to the overall level of provision in each country in the region. However, having specific information related to PwD makes it possible to focus the efforts and resources required by this population. There is a need to promote the inclusion of data on PwD with the statistical institutions in each country, specifically in censuses and household surveys. Similarly, in the case of service providers, it is important that it is possible to identify PwD data in order to provide appropriate service to customers and ensure that they receive services with reasonable accommodation of PwD needs.
- **Access to basic services.** There may be barriers to

the accessibility of public services in the areas of water, sanitation, such as: distance to water sources, inaccessible latrines or public toilets, steps or unpaved roads, lack of privacy in personal hygiene for PwD, insecurity, rejection and social harassment.

- **Access to energy.** In the case of the energy sector, cooking with wood generates health and respiratory problems, and the isolation of energy sources prevents the use of electrically charged elements (e.g. electric wheelchair, electric oxygen respirator or other support elements) (Gogo 2017). There is also a need to promote access to the Internet for low-income populations with disabilities, taking into account benefits such as telemedicine services, access to employment opportunities, social support networks, etc.
- **Access to transportation.** With respect to transport, although transport systems are concentrated in cities<sup>32</sup>, inter-city and inter-municipal transport serves the rural population, however, most is not affordable (Rickert, Pautas de Accesibilidad para Sistemas Integrados de Transporte Masivo 2006) or accessible to PwD (San Francisco State University 2017).

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32. It is important to highlight the interdependence and complementarity of the different modes of transport, motorized and non-motorized, large and small, urban and rural, land and water, as well as the integration of the different types of services (long distance, local) and operators (public, commercial, individual) (Rickert, Pautas de Accesibilidad para Sistemas Integrados de Transporte Masivo 2006).

- In terms of physical barriers in transportation, many buses remain inaccessible. Despite legislation, governments have extended deadlines for transport system operators to comply with the obligation to provide a 100% accessible bus fleet. It is the responsibility of governments not to grant additional deadlines and to comply with the accessibility requirements included in their legislation. The examples of Brazilian cities such as Curitiba (Ayuntamiento de Curitiba 2012) or Uberlandia (Kazuchi 2010) show that it is possible for franchisees and operators to agree to comply with this requirement, while still obtaining economic profitability, in addition to offering the service to the entire population.
- A transport system has aspects related to access and egress travel that must be integrated into the development of transport infrastructure. That is, starting from the pedestrian accessibility needed to get to the bus or station, with views of the bus entrance, journey and arrival. According to the BRT (bus rapid transit) accessibility guide, “the chain of accessible travel begins with sidewalks and crosswalks” (Rickert, BRT Accessibility Guidelines 2007). “BRT corridors should provide accessible pedestrian pathways along their route and should ensure that major trip generating destinations are connected to BRT stations by accessible sidewalks” (Rickert, BRT Accessibility Guidelines 2007). The accessibility of public space and sidewalks is essential to comply with accessible transportation, therefore, projects



should include this element and ensure that universal design is present in transportation projects in an integrated manner.

- **Social barriers.** Social barriers related to access to the public services analyzed are observed. In the social environment there is mockery, harassment, insecurity, lack of empathy that excludes the PwD and that, sometimes, makes this population avoid accessing the service in a public way or look for schedules that can put their lives at risk to avoid meeting the harassers. (Devine 2017).
- **Communication barriers.** With regard to communication barriers, it can be observed that PwD continue to be excluded from participation due to the scarce -if not non-existent- offer of accessible communication channels. There is a need to create a culture of inclusion and disseminate information through captioned video, sign language, screen reader accessibility, legible typography and face-to-face channels. It is important to maintain face-to-face communication channels, because

sometimes lack of affordability of technology is another gap faced by PwD.

- **Good practices.** Good practices in water, sanitation, energy and transport services are those that focus on promoting the participation of PwD, addressing stigma and discrimination, raising awareness, and taking disability into account in the design, monitoring and evaluation of physical infrastructure interventions.

Below is a summary table of the obstacles and actions for improvement in the Water and Sanitation, Energy and Transport services. The physical, social and communication barriers to water and sanitation, energy and transport services identified in this study are presented. These are domestic architectural environments, or urban or rural environments. Given this barrier the opportunity or action for improvement is presented. Through the list of barriers it is possible to identify how to address or generate greater inclusion in infrastructure and energy projects.



Tabla 3. Resumen de las barreras y acciones de mejora en los servicios de Agua y Saneamiento, Energía y Transporte						
Environment	Water and sanitation service		Energy Service		Transportation services	
	Barrier	Improvement action	Barrier	Improvement action	Barrier	Improvement action
Physical barriers	Home	Inaccessible toilets or physical infrastructure		Adapt the kitchen so that a PwD can use it safely (variations according to disability). The design recommendations are: free width of 90cm, for turning radius 1.50 mt. Tables of 70cm and 60cm deep. Smoothly shaped furniture, without edges or protrusions that could cause injury. Minimum illumination of 300 lux. Devices should provide visual and auditory information. Smoke, water and gas leak detectors with alarm, lever taps or extendable hose. Non-slip paving. ( <a href="http://www.mldm.es/BA/212.shtml">http://www.mldm.es/BA/212.shtml</a> )		
		Lack of independence to carry out hygiene tasks	adios-barreras-guia-para-el-diseno-de-espacios-mas-accesibles.	Air pollution from cooking with firewood	Switch to renewable energy sources or electricity supply.	
	Rural Housing	Inaccessible or out-of-home bathrooms	To the extent that the bathrooms are adapted, the PwD has greater independence and can perform tasks in privacy.	Exclusion from energy service	Universal access to energy. Latin America and the Caribbean could be the first region in the world to achieve universal access to modern energy.	
	Rural	Lack of accessibility to the physical environment and to the elements that allow the use of the service.	Provide accessibility to bathrooms and aids to perform tasks independently.	Difficulty in transporting firewood and kindling for cooking	Switch to renewable energy sources or electricity supply.	Inaccessible sidewalks (no ramps, no even obstacle-free surfaces) Reconstruction and adaptation of sidewalks with accessibility and road safety standards.

Tabla 3. Resumen de las barreras y acciones de mejora en los servicios de Agua y Saneamiento, Energía y Transporte						
Environment	Water and sanitation service		Energy Service		Transportation services	
	Barrier	Improvement action	Barrier	Improvement action	Barrier	Improvement action
Physical barriers	Urban	Difficulty in identifying the container in which the garbage should be deposited.  Containers that include a handle to open the lid and a notice in Braille so that visually impaired persons can know what type of waste they should deposit.	Presence of poles in the middle of the sidewalk that impede the passage of a person in a wheelchair	Verification of accessible construction guidelines for electrical boxes and pole locations in public space.	Lack of safe crossings with audible traffic lights and horizontal and vertical signaling (road safety)	Include signage and road safety in the transport project works.
	Urban and Rural	Difficulty in transporting drinking water	Access to public drinking water and sanitation services.		Inaccessible transportation	Include ramps/elevators on buses, preferential seating and space for wheelchairs and cars, visual and audible signage at stops. Car parks with access ramp. Stations with a ramp with a gradient of less than 10%. Signage at bus stops and bus stations.
		Lack of access to water and sanitation services	Water treatment investments that guarantee a standard of quality and safety of drinking water.		Inaccessible infrastructure (around the station, bus stops)	Reconstruction and adaptation of sidewalks with accessibility and road safety standards. Car parks with access ramp.
		Use of non-drinking water that generates diseases.	Plantas de tratamiento de agua que garanticen un estándar de calidad y seguridad del agua potable.		Inaccessible vehicles	Include ramps/elevators on buses, preferential seating and space for wheelchairs and cars, visual and audible signage at stops.
					Discrimination	Empathy and respect campaigns (with emphasis on PwD) in the transport system.

Tabla 3. Resumen de las barreras y acciones de mejora en los servicios de Agua y Saneamiento, Energía y Transporte						
Environment	Water and sanitation service		Energy Service		Transportation services	
	Barrier	Improvement action	Barrier	Improvement action	Barrier	Improvement action
Social barriers	Home	Low self-esteem due to lack of hygiene problems	Water and sanitation utilities, including accessibility standards in toilets. Support for utility subsidies	High cost of energy bills.	Subsidy for PwD.	
		Lack of affordability of service (non-payment of service)	Subsidies to PwD or vulnerable population.	Lack of affordability of service (non-payment of service)v	Subsidy for PwD.	
	Urban	Low self-esteem due to lack of hygiene problems	Water and sanitation utilities, including accessibility standards in toilets. Support for utility subsidies		Lack of alternatives to recharge travel cards outside the ticket office	Recharge online (Internet) or through online banking. Recharging at commercial establishments outside the transport system.
	Urban and Rural	Community rejection of PwD for lack of cleanliness	Connection to water and sewage services. Dissemination of respect and empathy towards PwD		Lack of driving protocols and attention to PwD (risk of accidents)	Generate policies for the inclusion of PwD in transportation systems and create protocols for attention and respect.
					Lack of empathy of users w/o disabilities and transport systems (exclusion from service).	Empathy and respect campaigns (with emphasis on PwD) in the transport system
					Lack of affordability of transport service	Transportation subsidy for PwD.

Tabla 3. Resumen de las barreras y acciones de mejora en los servicios de Agua y Saneamiento, Energía y Transporte							
Environment		Water and sanitation service		Energy Service		Transportation services	
		Barrier	Improvement action	Barrier	Improvement action	Barrier	Improvement action
Communication barriers	Home		Lack of Internet access.	Low-cost Internet access and energy subsidy programs for PwD.			
	Urban	Exclusion in the communication regarding collection invoices.	Invoice request according to need, example: invoice in Braille.	Exclusion in the communication regarding collection invoices.	Invoice request according to need, example: invoice in Braille.	Lack of transport system signage (signs, maps, routes, stops, etc.)	Visual and auditory signage within the transport system, the urban environment, stations and inside buses.
						Unreadable lettering on service maps	Large font with contrasting background color.
						Lack of accessible applications (for different disabilities)	Open data by service providers, enabling the community and developers to make functional applications for different types of disabilities.
						Lack of auditory and visual information in stations and buses	Inclusion of visual (screens) and auditory information in stations and buses.
		Exclusion in communication and customer service due to lack of diverse and accessible communication channels	Recognize different disabilities, provide adequate attention, according to the interaction channel, to PwD (e.g., access to interpretation services, captioning service, visual signage, information in simple, explicit and brief language, verification of instructions with graphic or visual aids, spaces built with universal design).	Exclusion in communication and customer service due to lack of diverse and accessible communication channels	Recognize the different disabilities, provide adequate attention, according to the interaction channel, to PwD (for example, access to interpretation services, subtitling service, visual signage, information in simple, explicit and brief language, verification of instructions with graphic or visual aids, spaces built with universal design...).	Lack of alternative channels of communication and available information	Recognize different disabilities, provide adequate attention, according to the interaction channel, to PwD (e.g., access to interpretation services, captioning service, visual signage, information in simple, explicit and brief language, verification of instructions with graphic or visual aids, spaces built with universal design).
	Urban and Rural	Lack of participation in projects due to community exclusion	Accessible communication and inclusion of PwD in community participation projects.	Lack of participation in projects due to community exclusion	Inclusive community participation for PwD.		
				Exclusion due to lack of communication	Inclusion of new clean or electric energy technologies. Internet infrastructure for rural areas.		
				Lack of access to telemedicine services, among others.	Inclusion of new electricity technologies. Internet infrastructure for rural areas.		

Source: own elaboration

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# Accessibility to Services

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