



Technical Note on Accessibility

Fact Sheet 5:

Accessibility in the Infrastructure
Operations

3



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Inside front cover

Technical Note on Accessibility

Part 3: The Thematic Fact Sheets

Fact Sheet 5:

Accessibility in the Infrastructure Operations



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This guidance is one of **four sets of documents constituting the World Bank Technical Note on Accessibility**. It is primarily meant for the Bank’s task team leaders (TTLs), program implementing units (PIUs) and E&S specialists. The note can be also used by other development partners, including World Bank clients. It focuses on investment project financing (IPF).

The sections that comprise the **Technical Note on Accessibility** are: **The Narrative (Part 1); The Project Cycle Guidance (Part 2); The Five Thematic Fact Sheets (Part 3); and The Technical References (Part 4)**.

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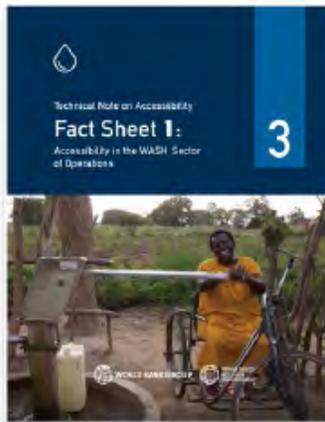
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Overview of the Thematic Fact Sheets



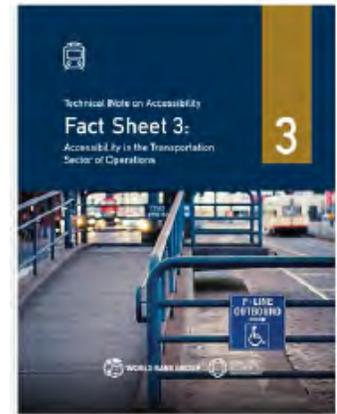
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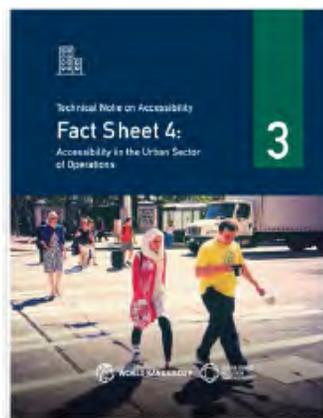
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Accessibility in the
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Fact Sheet 2:
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Fact Sheet 5:
Accessibility in
Infrastructure Operations

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Infrastructure and Accessibility



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With **increasing urban populations around the world**, there is a great need for accessible infrastructure, especially in cities. When the needs of persons with disabilities are considered in infrastructure planning, drawing on the principles of universal design, persons with disabilities have greater independence and access to employment, transport, health care, and other necessary services.

An accessible infrastructure can take many forms: for example ramp access to buildings, tactile strips marking safe paths for visually impaired persons or adapted toilets with grab rails. Ensuring access to the built environment is a crucial element in reducing the vulnerability and isolation of persons with disabilities, and in allowing them to enjoy every aspect of the life of their community, on an equal basis with others. In addition, these measures benefit not only persons with disabilities but also every person in society.

Infrastructure interventions can be planned as **isolated efforts, or as part of a larger urban development plan** that involves policies and strategies that support inclusion through access to markets, services, education, and future development projects for every individual, particularly persons with disabilities. Local governments and municipalities should consult with persons with disabilities to understand how policy and built environment changes can reduce barriers to participation. In the context of emergency preparedness and resilience, accessibility means that there are plans in place to support persons with disabilities, and to ensure protection of their basic rights in such situations.



Particularly in low-income countries, the lack of accessibility reinforces the cycle of disability and poverty. Every infrastructure project should be a driver for development, innovation, better living conditions, democracy, and inclusion. It should be seen as an opportunity to experiment, address design challenges in new ways, and overcome an approach to architecture that is built around an “average man,” without considering the diversity of human characteristics in terms of gender, size, cultural background, abilities or disabilities, and special needs.

Finally, **climate change** is causing increasing hardship for all people, especially for persons with disabilities. Accessibility of infrastructure can contribute to mitigating some of the negative effects of changing environments on persons with disabilities - decreasing access to clean water, sanitation, and hygiene (WASH); increasing emergencies due to extreme weather events; reduced access to infrastructure, shelter, and basic services; and increasing displacement and migration, or necessary migration that is not possible for some persons with disabilities.

By building today’s cities, and the smart cities of tomorrow following the principles of universal design and accessibility, the World Bank has the potential to deliver on its promises of greater inclusion.



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Key Elements



Accessible approaches in the infrastructure sector extend their positive effects across many other sectors as well. For example, they are crucial to ensuring disability-inclusive education, health care, culture, and employment; to realizing more inclusive urban plans and disaster risk reduction (DRR) strategies; and to advancing digital accessibility related to wayfinding that can later be used in other sectors as well.

Other sector-specific accessibility interventions can also contribute to a more accessible infrastructure. For example, accessible ICT solutions can be applied to smart orientation systems or to building components; inclusive mobility approaches can facilitate access to buildings; and the adoption of accessibility standards for public transportation can highlight the need to ensure accessible buildings as well.

When planning accessible infrastructure, an **unbroken chain of movement** has to be ensured: urban planning and inclusive mobility solutions need to ensure that persons with disabilities are able to **Reach** the infrastructure; the design of the infrastructure needs to ensure that they are able to **Enter** the building; to **Circulate** around it; and to **Use** all the relevant spaces within the building freely and independently (following the **R.E.C.U. steps**). The accessibility of buildings concerns their physical construction, internal furniture and equipment, wayfinding and signposting systems, as well as safety and security measures.

Infrastructure construction can be an independent activity, or a subcomponent of more comprehensive urban development initiatives. Either way, it should not be addressed



as if infrastructure were a set of isolated elements, but rather should be integrated into inclusive urban planning strategies and policies (*For more detail, please refer to the [Urban and Transportation fact sheets](#)*).

Infrastructure, whatever its nature (housing, public buildings, public spaces, education facilities, health services, mobility-related, etc.) *must* comply with international and national regulations concerning accessibility. International standards like the ISO provide an overall framework that can inform national standards (when they exist) or replace them (when they are not available or they are not detailed enough); national regulations should define the way accessibility principles are to be implemented: what to do; how to do it; who will do it (roles and responsibilities); to what extent it will be done; which buildings or facilities will be concerned (existing? new? both existing and new?); and what deadlines, sanctions, and so on, apply.

The involvement and participation of persons with disabilities and their representing organizations must be ensured in all phases of an infrastructure project, from needs assessment to design, follow-up of construction, and testing and evaluation after completion, to make sure their needs are being properly taken into account, and to ensure the quality of the implementation.

Accessibility of infrastructure cuts across every sector of operation. This means that a cross-silo approach should be adopted when addressing accessibility issues, applying the same overall principles to any activity concerning buildings or infrastructure, new or existing. Some of the specific issues that can be addressed following the overall principles of accessibility include:

- **Education:** Adaptation of standards for children of different ages and sizes; accessibility considerations for black / green boards; classroom furniture; visual and acoustic conditions; specific measures for complex wayfinding systems (on large campuses); adaptation of pedagogical tools and techniques.
- **Health:** Adapted furniture and equipment for medical care (for example adjustable consultation beds); specific measures for complex wayfinding systems (in large hospitals); access to information in multiple accessible formats (health promotion, disease prevention, practical activities like booking an appointment, receiving exam results, and so on).
- **WASH:** Accessible toilets or latrines provided for services in every sector; adapted handwashing facilities in schools and health centers; accessibility considerations when addressing water points and related equipment; and so on.



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Data at Glance



Figure 1: Image Source: <https://sdgs.un.org/>

Share of Urban Population

LIVING IN SLUMS

Rose to 24% in 2018

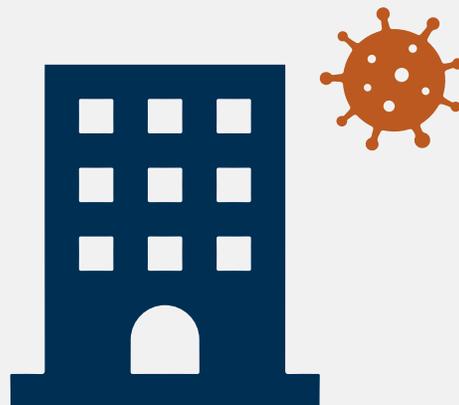


Figure 1: Image Source: <https://sdgs.un.org/>

COVID-19 Implications

OVER 90%

OF COVID-19 CASES ARE IN URBAN AREAS



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International Framework



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The **Convention on the Rights of Persons with Disabilities (CRPD)** recognizes the importance of accessibility to the physical, social, economic, and cultural environment, to health and education, and to information and communication, in enabling persons with disabilities to fully enjoy all human rights and fundamental freedoms. It also encourages state parties to take appropriate measures to develop, promulgate, and monitor the implementation of minimum standards and guidelines for the accessibility of facilities and services that are open or provided to the public, and to ensure that private entities that offer facilities and services that are open or provided to the public also consider all aspects of accessibility for persons with disabilities.



Agenda 2030 for Sustainable Development dedicates one of their specific goals to making “cities and human settlements inclusive, safe, resilient and sustainable” (SDG 11). Accessibility of infrastructure is essential in order to reach this goal, through inclusive housing, the upgrading of slums, accessibility of basic services, protection of cultural and natural heritage, and so on. Inclusive and accessible infrastructure is also essential for meeting other goals, in particular SDG4 (Education); SDG8 (Decent Work and Economic Growth); SDG9 (Industry,



Innovation, and Infrastructure); and SDG10 (Reduced Inequalities). This inclusion (and accessibility) goal for cities is particularly crucial if we consider the estimations from UN DESA that by 2050 68 percent of the world's population, around 6.6 billion people, will live in urban areas¹. The World Health Organization (WHO) estimates that around 1 billion persons with disabilities will be living in urban areas by 2050.

The **New Urban Agenda**, which specifically concerns cities and urban settlements, is a tool that suggests practical actions that decision makers can take to enhance the overall quality of cities. Inclusion, accessibility, and disability are addressed in a cross-cutting way in more than 50 articles that tackle, among other things, housing, infrastructure and urban space, and water and sanitation issues.

Where they exist, national or local **accessibility standards** address features both inside and outside of buildings, such as entrances (ramps, entry doors, signposting, reception areas, etc.); horizontal and vertical circulation within buildings (corridors, elevators and staircases, doorways, etc.); and the use of each space of a building (absence of thresholds and obstacles, type and position of electric fittings, layout of toilets, adjustability and flexibility of furniture, etc.).

As a general rule, national, local or regional standards must be complied with. International standards like the **ISO 21542:2021, Building Construction - Accessibility and Usability of the Built Environment** should be integrated into existing mandatory standards when these are not available, or if they are too permissive. In addition, standards from other countries can be used as a reference when they seem relevant. For example:

- > **The British Building Regulations for Access to and Use of Buildings**
- > **The ADA Standards for Accessible Design**
- > **The Dubai Universal Design Code**

1 United Nations. Department for Economic and Social Affairs. 2018. **News.** (May 16, 2018).



МЕСТО ДЛЯ СБОРА
БОЛЕЛЬЩИКОВ-МГН



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Examples of Key Challenges and Actions for Accessibility in Infrastructure



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Type of Difficulty	Challenges in Accessing Infrastructure	Considerations for Reducing Barriers
<p>Physical (mobility, dexterity, and physical strength)</p>	<ul style="list-style-type: none"> ➤ No ramp or elevator access to a building’s entrance, if on a raised basement; ➤ Too-narrow doors at the entrance or within the building; ➤ Dexterity required to operate doors, windows, electric fittings, taps, furniture, etc.; ➤ Obstacles or thresholds in corridors or inside rooms; ➤ Elevators not accessible for persons using a wheelchair; ➤ Staircases with no handrails, or with tripping hazards; 	<ul style="list-style-type: none"> ✓ Create multiple accessible ways to enter a building; ✓ Increase the width of doorways, and avoid revolving doors; ✓ Provide devices that allow the use of doors, taps, and furniture for those with the lowest level of dexterity; ✓ Ensure that there are flat, even surfaces, with no steps or other obstacles, and that they are firm, nonreflective, and anti-slip; ✓ Provide accessible elevators;



Type of Difficulty	Challenges in Accessing Infrastructure	Considerations for Reducing Barriers
	<ul style="list-style-type: none"> ➤ Absence of resting areas in corridors. 	<ul style="list-style-type: none"> ✓ Equip staircases with handrails, contrasting noses of steps, and intermediate landings; ✓ Provide benches and seats at bus stops and train stations.
Visual	<ul style="list-style-type: none"> ➤ Small, low-contrast electric switches and sockets; ➤ Glazed doors or partitions; ➤ Staircases with irregular steps, noses that are not in contrasting colors, absence of tactile warnings; ➤ Visual or touch screen controls in elevators; ➤ Visual wayfinding and signposting system for orientation. 	<ul style="list-style-type: none"> ✓ Provide electric fittings in colors that contrast with the wall; ✓ Avoid glazed doors and partitions, or provide them with appropriate visual marks; ✓ Provide tactile strips within the building, at least before and after a flight of steps; ✓ Provide audio, tactile, and braille information.
Hearing	<ul style="list-style-type: none"> ➤ Absence of appropriate wayfinding and signposting systems for orientation; ➤ Information provided at reception area relies on the ability to hear. 	<ul style="list-style-type: none"> ✓ Provide clear wayfinding and signposting panels, especially in complex and large buildings. ✓ Provide information at the entrance in multiple formats, including print.
Speech	<ul style="list-style-type: none"> ➤ Reliance on speech to communicate with operators 	<ul style="list-style-type: none"> ✓ Provide information at the entrance in multiple formats, including print.



Type of Difficulty	Challenges in Accessing Infrastructure	Considerations for Reducing Barriers
	at reception area, or to orient within a building.	
Cognitive	<ul style="list-style-type: none"> ➤ Complex buildings with no appropriate wayfinding symbols (relying only on text and using no symbols or icons). 	<ul style="list-style-type: none"> ✓ Provide plain-language or simplified pictorial maps in the building.
Psychosocial	<ul style="list-style-type: none"> ➤ Complex buildings with no appropriate wayfinding symbols (relying only on text, using no symbols or icons); ➤ Absence of “silent places” where people can rest in case of distress. 	<ul style="list-style-type: none"> ✓ Provide plain-language or simplified pictorial maps in the building.

For additional details on practical recommendations for this sector, please refer to **[PART 4 of this Technical Note: “Technical References.”](#)**

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Accessible Infrastructure Projects

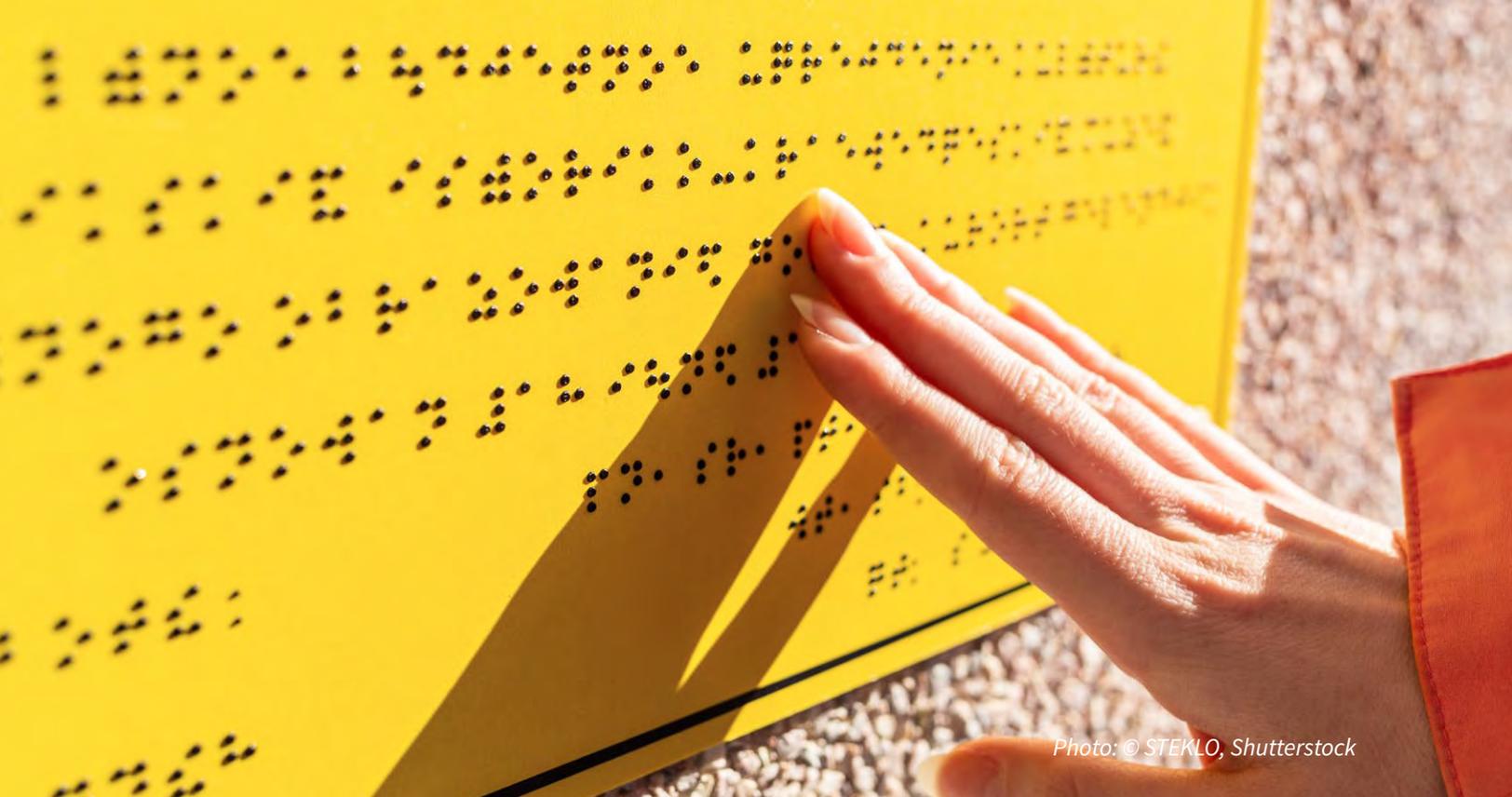


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NOTE: This section contextualizes the main sections of **Part 1 of this note (the Narrative)**, in which the desired conditions for accessibility, together with possible activities, are described with an overarching perspective. Here, concrete examples are provided for the infrastructure sector.

An accessible infrastructure project aims at achieving some key conditions for accessibility, such as:

Condition	Description/ Examples
Institutional Commitment	Existence of infrastructure policies and strategies aimed at better inclusion of persons with disabilities.
Operationalization	Enforcement of implementation mechanisms to ensure that compliance with accessibility standards is actively required, monitored, and evaluated.
Empowerment	Capacity development for accessibility in infrastructure for all relevant actors and at all stages.



Condition	Description/ Examples
Enactment	Funding and support for projects that improve the accessibility of Infrastructure.
Durability	Development and sharing of knowledge about accessible Infrastructure.

It should also implement the main activities that can contribute to the enhancement of accessibility in the sector, such as:

Activity	Description/ Examples
Advocacy / Awareness Raising	Raises awareness and sensitizes local authorities, institutions, development actors, professionals, the general public, and all stakeholders on the importance of disability-inclusive infrastructure.
Assessment and Data Collection	Assesses the existence and quality of local policies, strategies, legislation, and standards or guidelines concerning the accessibility of infrastructure; and supports the development or improvement of the needed tools; Assesses the existence and quality of local implementation mechanisms concerning the accessibility of infrastructure, and supports the definition or improvement of the needed processes.
Budget and Human Resources	Ensures allocation of appropriate funds for accessibility implementation in terms of activities and human resources.



Activity	Description/ Examples
<p>Meaningful Participation</p>	<p>Works to empower organizations or persons with disabilities (OPDs) as the main actors in the process;</p> <p>Promotes inclusive and participatory approaches at all stages of an infrastructure project (initial needs assessment; design and proposal review; monitoring and testing of works; evaluation of implemented activities);</p> <p>Considers disability for the public, but also for public infrastructure sector staff.</p>
<p>Capacity Development</p>	<p>Supports the technical capacity development of local professionals in the sector, university students, development workers, etc.;</p> <p>Engages sector stakeholders and OPDs in thematic seminars, workshops, conferences, and other public events concerning accessible and inclusive infrastructure;</p> <p>Encourages the development of communities of practice, and the creation and sharing of research, publications, good practices and lessons learned, and other capitalization tools.</p>
<p>Technical Support for Stakeholders</p>	<p>Promotes the enforcement, creation, or revision of inclusive infrastructure policies, standards, and enforcing mechanisms;</p> <p>Addresses all aspects of accessibility in infrastructure: buildings, wayfinding and signposting, furniture and equipment;</p> <p>Considers the needs of persons with various types of disabilities.</p>



Activity	Description/ Examples
Procurement	Promotes the adoption of public procurement strategies that refer to accessibility standards for infrastructure, building solutions, furniture and equipment.
Involvement of Private Sector	Provides incentives to spur research and innovation in the private sector for more accessible infrastructure and building solutions.

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Practical Examples



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Recommendation	Example
<p>Holistic Approach: Address accessibility gaps in urban settlements, taking into account the capacity development of local stakeholders, developing and adopting accessibility standards, etc.</p>	<p>In Singapore the Building and Construction Authority carried out a 10-year project to develop and implement an Accessibility Master Plan (2006) to promote the adoption of universal design (UD) in the built environment, targeting persons with disabilities and older persons in particular². Master Plan activities have included removing existing barriers, raising minimum accessibility standards, promoting UD through guidance and a certification scheme, and building capacity among industry stakeholders.</p>
<p>Implementation of Accessibility Standards:</p>	<p>In Vietnam, persons with disabilities have been identified as specific beneficiaries in the Scaling Up Urban</p>

2 United Nations. Department of Economic and Social Affairs. 2016. [Good Practices of Accessible Urban Development: Making Urban Environments Inclusive and Fully Accessible to All](#). New York: United Nations.



Activity	Description/ Examples
<p>Make sure that the project's interventions are compliant with relevant accessibility standards.</p>	<p>Upgrading Project (P159397). This disability-inclusive project in several medium-sized cities implements technical standards for accessible infrastructure; universal design in urban environments, roads, schools and public facilities; and transport accessibility.</p>
<p>Human Resources: Ensure that each project includes the necessary technical expertise on accessibility during all relevant phases (assessment, design, implementation, evaluation).</p>	<p>During project preparation of the Scaling Up Urban Upgrading Project (P159397), an architect who is an accessibility expert was hired to conduct a thorough audit. During implementation, the project hired a firm to: 1) Provide advisory services on detailed design for universally accessible infrastructure (including recommendations for each subtype of infrastructure); 2) Prepare design guidelines to incorporate universally accessible infrastructure principles and design; and 3) Provide training in universally accessible infrastructure principles and design. Supporting tasks include a rapid review of the Vietnamese legal and regulatory framework on universally accessible infrastructure design and development; an assessment of baseline needs in the cities; and sharing global experiences on universal accessibility.</p>
<p>Consider Diversity: Address accessibility issues from a perspective that considers all different types of disabilities.</p>	<p>The World Bank's Rio Cidade Project, which was carried out in the 1990s, was the first urban revitalization project in Brazil that applied the principles of universal design extensively in 14 urban districts. The project had all users in mind, regardless of their physical abilities, based on estimates that more than half of the population did not fit the standard stereotypical individual for which most infrastructure has been designed around the world. Universal solutions included ramps that serve all pedestrians at crosswalks, as well as more</p>



Activity	Description/ Examples
	<p>specialized solutions, such as texture-coded footways to guide visually impaired road users. Street fixtures like lampposts, signposts, litter baskets, and benches were repositioned and resized to meet the requirements of universal design. The project became a benchmark for universal design in Brazil.³</p>
<p>Implementation: Ensure that relevant public infrastructure becomes an example of good practices in accessibility.</p>	<p>The Singapore Accessibility Master Plan (2006) has resulted in wide-ranging improvements in accessibility, and the application of universal design principles in new buildings and in existing buildings undergoing major alterations. For example, almost 100 percent of government buildings frequented by the public have now been made barrier-free.⁴</p>

³ World Bank. 2018. [Disability Inclusion and Accountability Framework](#). Washington, DC: World Bank.

⁴ Ibid.

9

Annexes: Useful Insights



Annex 1:

Overall Definitions

Accessibility is the degree to which persons with disabilities can have access, “on an equal basis with others, to the physical environment, to transportation, to information and communications, including information and communications technologies and systems, and to other facilities and services open or provided to the public, both in urban and in rural areas.” (CRPD, Article 9).

Accessibility is about applying the seven principles of **Universal Design** both to new infrastructure, products, or services, and/or to existing ones (to the extent possible, while taking into consideration the local context). Universal Design means “the design of products, environments, programs and services to be usable by all people, to the greatest extent possible, without the need for adaptation or specialized design.” (CRPD, Article 2).

It is not always possible to apply the principles of Universal Design to the fullest, but it is always possible to identify and provide reasonable accommodation to a person who requires it. **Reasonable Accommodation** is a “necessary and appropriate modification and adjustments not imposing a disproportionate or undue burden, where needed in a particular case, to ensure to persons with disabilities the enjoyment or exercise on an equal basis with others of all human rights and fundamental freedoms.” (CRPD, Article 2).



Annex 2:

Typical Accessibility-Related Steps of an Infrastructure Project

For refurbishments of existing infrastructure:

- > Accessibility budgeting and planning
- > Identification and training of the design team in the principles of accessibility
- > Participatory accessibility assessment of the building (that is, involving persons with disabilities)
- > Identification, cost estimates, and prioritization of accessibility interventions
- > Development of technical documents, including the application of UD standards
- > Participatory monitoring of the design (in consultation with persons with disabilities)
- > Procurement/Tendering
- > Training builders on accessibility issues
- > Participatory monitoring of construction phase (consistency with design, quality)
- > Participatory performance evaluation of the building when in use
- > Capitalization and lessons learned (process, innovative solutions, interaction between stakeholders, etc.)

For new constructions/interventions:

- > Accessibility budgeting and planning
- > Identification and training of the design team on accessibility issues
- > Participatory needs assessment for the new building, and development of a design brief



- > Development of technical documents, including the application of UD standards
- > Participatory monitoring of the design
- > Procurement / Tendering
- > Training of builders on accessibility issues
- > Participatory monitoring of the construction phase (consistency with design, quality)
- > Participatory performance evaluation of the building when in use
- > Capitalization and lessons learned (process, innovative solutions, interaction between stakeholders, etc.)



Annex 3: Why Accessibility in Infrastructure Matters: Advocacy Tips

NOTE: This section contextualizes [Chapter 3 and 5.B.3 of Part 1 of this Note \(the Narrative\)](#), in which the main arguments in favor of accessibility are described with an overarching perspective; here concrete examples are provided for the infrastructure sector.

Social Benefits

- Accessibility of public buildings and infrastructure is not a voluntary choice or an act of goodwill; it is a right for persons with disabilities that is recognized by international treaties.
- Accessibility is a legal obligation for states, especially those that have ratified CRPD; and its implementation is monitored at the international level.
- Accessibility of public infrastructure is a condition for inclusion (together with nondiscrimination and participation).
- Accessibility of infrastructure is beneficial for all members of society; it is a shared value not only for persons with disabilities, but also for older people, children, pregnant women, persons with temporary injuries, etc.
- Accessibility of buildings and infrastructure boosts dignity and self-esteem because it allows persons with disability to live their lives in a more independent way, and become less reliant on other people's help, and more self-confident.
- More accessible built environments allow persons with disabilities to fully reach their potential as human beings in the domain of their choice.
- Accessibility of public infrastructure such as gathering points, collective shelters, refugee settings, WASH and health care facilities, and so on, is a lifesaving requirement in emergency preparedness and response, in order to ensure that persons with disabilities will not be left behind in case of natural disaster, conflict, etc.



- In global emergencies like the outbreak of the COVID-19 pandemic, the availability of healthy, safe, and accessible infrastructure is of immense importance in order to ensure that persons with disabilities can benefit from services safely, without putting themselves at risk of infection.

Other Benefits

- Accessibility of buildings and infrastructure allows more persons with disabilities to work (and therefore contribute to the development and increase of a country's GDP), so that they can:
 - ✓ Rely less on national allowances (allowing these funds to be used elsewhere);
 - ✓ Become consumers (and contribute to the economy of the country);
 - ✓ Become taxpayers (and contribute to developing the country).
- Accessibility of the built environment allows persons with disabilities to be more independent so caretakers and family members can spend more time working, producing, and consuming.
- Accessibility improvements, especially in infrastructure like hotels, cultural and historical centers, museums, theatres, and so on, would allow more persons with disabilities to benefit from tourist attractions (contributing to the development of tourism).
- Accessibility of infrastructure is visible (and therefore can affect the way a country is perceived).
- Accessibility is not very expensive (and is generally quite cost-effective).



Annex 4:

The ISO Approach:

Key Accessibility Issues

The **ISO 21542:2021, Building Construction - Accessibility and Usability of the Built Environment** standards define, in addition to detailed accessibility standards for various areas of a building, nine key accessibility issues that can be used as a conceptual framework through which to design or analyze the accessibility of an infrastructure. If the principles underlying these key issues are not known or understood, the mere application of standards is not likely to be enough to ensure the quality of the intervention. The nine key issues are:

- **Equitable approach to a building.** This can be provided, for example, by designated parking; clear pedestrian routes that are separate from lanes for vehicles and cyclists; no steps or obstacles; short distances from parking and public transport; and good signage, good lighting, and good visual contrast.
- **Equitable entry via public entrances.** For example, easy-to-locate main entrances, no steps or obstacles, wide door openings, adequate maneuvering space in front of the door, no need of great strength to operate the doors, good signage, good lighting, and good visual contrast.
- **Equitable use of the same paths in horizontal circulation of buildings.** For example, no steps or obstacles, adequate maneuvering space, wide door openings, easy-to-operate doors, resting places (e.g. benches), clear layout, good signage, good lighting, and good visual contrast.
- **Equitable access to the same paths in vertical circulation of buildings.** For example, safe stairs, spacious lifts that are easy to operate, good signage, good lighting, and good visual contrast.
- **Equitable use of the same rooms.** For example, ample circulation space and various seating possibilities, good acoustics and hearing enhancement systems, good lighting, and good visual contrast.



- > **Equitable use of the same equipment and facilities.** For example, equipment that is easy to understand and operate, adequate maneuvering space and operating height, information received via at least two senses.
- > **Equitable use of toilet and sanitary facilities.** For example, good signage, adequate maneuvering space, good options for transfer from wheelchairs to toilet seats, well-placed equipment, easy operation.
- > **Equitable exit and evacuation routes, clear concepts for emergency planning.** For example, no steps or obstacles, fire-protected lifts/elevators, good signage, good lighting, good visual contrast, good fire safety, protection, and evacuation, accessible evacuation routes.
- > **Important information via two senses or more.** For example, visual, audible, and tactile.



Annex 5: Contextualization and Durability

Contextualization

Accessibility improvements should be addressed keeping in mind the context and the specific feasibility of proposed interventions. Sometimes the optimal accessibility solutions are not possible, or realistic. Accessibility provisions might therefore need to be adjusted according to the specific context, relying on what is called “reasonable accommodation.” For example:

- Installing an elevator in a building can seem the best option to ensure the vertical circulation of persons with mobility impairments. However, if the building is old and it lacks either sufficient space or structural strength for an elevator, this might not be possible. Similarly, in countries where loss of power and electricity failures are frequent, elevators can become a threat to security or, at least an unreliable means of circulation.
- Likewise, in emergency situations it might not be possible to put into place accessibility solutions that are perfectly compliant with standards due to lack of the necessary materials, items, time, or expertise. In such cases, adaptations might be required, and standard products could be replaced with local solutions (for example, tactile paving could be created not with prefabricated tiles but by stamping a raised pattern directly onto the concrete surface of a landing).

Durability and Maintenance

Although a thorough design is likely to tackle most potential accessibility issues, only after the building has been used for a while is it possible to assess with certainty whether users with disabilities are actually satisfied with the implemented solutions. For this reason, it is important to ensure that a post-occupancy evaluation of accessibility is conducted in the building, preferably during the period of warranty. This evaluation should consider the following factors:



- > **Poor execution of the works by the builder** (ramp surface not properly realized, handrails not properly fixed, toilet seats not properly installed, etc.). In this case, a site visit during the period of warranty can identify any problems that are responsibility of the builder, and require that the builder correct them.
- > **Changes made in the building by managers or owners** (rooms used for different purposes than the ones described in the wayfinding panels, switches for newly installed fans not accessible, etc.). In this case, the site visit can identify any accessibility issues that are related to these new elements, and recommendations can be provided to mitigate them.
- > **Misuse of the building by users** (vehicles parked in the accessible parking bay, objects stored inside an accessible toilet, limiting the maneuvering space, plants growing at the bottom of a ramp that hinder its use by persons using a wheelchair, etc.). In this case, the site visit can identify such negative habits and provide users with recommended “Do’s and Don’ts.”



Annex 6: Indicators for Accessibility in Infrastructure

According to the [ESCAP Guide on Disability Indicators for the Incheon Strategy](#) there are two different ways of capturing the environment. The first is at the individual level, and reflects the actual interaction between a person and their immediate environment. It includes the home, workplace, markets, places of worship, schools, government offices, buses, and any other space or institution with which an individual may interact. It deals with the physical environment - both structures and materials - as well as people's attitudes about its use, and about the rules, laws, and policies that concern it. To facilitate the operationalization of the Incheon Strategy, the ESCAP guide suggests some indicators and monitoring mechanisms to reach *Goal 3: Enhance access to the physical environment, public transportation, knowledge, information and communication*. The most relevant in terms of infrastructure are:

INDICATOR 3.1: Proportion of Accessible Government Buildings in the National Capital

Definition: The proportion of government buildings in the national capital that are accessible to people with a diverse group of disabilities. These buildings include government offices and buildings where government services are provided. An accessible government building is one where a person with a disability has no barrier in entering it and using all the facilities therein. This covers the built environment – surfaces, steps and ramps, corridors, entryways, emergency exits, parking - as well as indoor and outdoor facilities, including lighting, signage, alarm systems, and toilets.

Data Collection and Methodology: Identifying accessible buildings requires annual accessibility audits that determine if a building meets agreed upon standards. Once a building is deemed fully accessible, an annual audit is not necessary, but should be required for any proposed changes to the structure or systems contained therein. A full audit can then be done on a less frequent basis. Standards of accessibility should be as consistent as possible with international standards, such as those of the ISO, considering the local



context. Regarding the built environment, [**ISO 21542:2021, Building Construction - Accessibility and Usability of the Built Environment**](#), delineates a set of requirements and recommendations concerning construction, assembly, components, and fittings.

INDICATOR 3.2: Proportion of Accessible International Airports

Definition: The proportion of international airports that are accessible to persons with diverse disabilities. An airport is accessible if a person with a disability has no barrier in entering it, using all the facilities, and boarding and disembarking from airplanes. This covers the built environment - surfaces, steps and ramps, corridors, entryways, emergency exits, parking - as well as indoor and outdoor facilities including lighting, signage, alarm systems, and toilets.

Data Collection and Methodology: Determining if an airport is accessible requires annual accessibility audits that ascertain whether a building meets agreed upon standards. Once a building is deemed fully accessible, an annual audit is not necessary, but should be required for any proposed changes to the structure or systems contained therein. A full audit can then be done on a less frequent basis.

INDICATOR 3.6: Availability of a Government Access Audit Program that Requires the Participation of Experts with Disabilities

Definition: The establishment and active implementation of a government access audit program that requires the participation of experts with disabilities. An access audit evaluates how well a particular building or environment can be used by the full range of persons with disabilities and recommends access improvements. This is done relative to a set of agreed - upon national standards defining an acceptable level of accessibility.

Data Collection and Methodology: Standards should be as consistent as possible with international standards, such as those of the ISO, considering the local context. In regard to the built environment, [**ISO 21542:2021, Building Construction - Accessibility and Usability of the Built Environment**](#), delineates a set of requirements and recommendations concerning construction, assembly, components, and fittings.

INDICATOR 3.7: Availability of Mandatory Technical Standards for Barrier-Free Access that Govern the Approval of All Designs for Buildings that could be Used by Members of the Public, Taking into Consideration



Internationally Recognized Standards, such as those of the International Organization for Standardization (ISO)

Definition: The establishment and active implementation of mandatory technical standards for barrier-free access that govern the approval of all designs for buildings that could be used by members of the public, taking into consideration internationally recognized standards, such as those of the ISO. An access audit evaluates how well a particular building or environment can be used by the full range of persons with disabilities and recommends access improvements. This is done relative to a set of agreed-upon national standards defining an acceptable level of accessibility.

Data Collection and Methodology: Standards should be consistent with international standards, such as those of the ISO. With regard to the built environment, **ISO 21542:2021, Building Construction - Accessibility and Usability of the Built Environment**, delineates a set of requirements and recommendations concerning construction, assembly, components and fittings.



Annex 7:

Additional Resources

Anjlee, A., and A. Steele. 2016. **Disability Considerations for Infrastructure Programmes.** Evidence on Demand.

Dennis, R. 1998. **Rural Transport and Accessibility: A Synthesis Paper.** Geneva: International Labour Organization.

Light for the World. 2014. **Towards an Inclusive Learning Environment for Students with Disabilities: Developing Architectural Design Guidelines for Accessible Educational Facilities.**

Pacific Regional Infrastructure Facility (PRIF). 2017. **Improving Accessibility in Transport Infrastructure Projects in the Pacific Islands.**

TUMI. 2019. **Disability Inclusive Public Transport: Practical Steps to Making Public Transport Disability Inclusive.** Applied Research Programme in High Volume Transport.

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