Access and Persons with Disabilities in Urban Areas

ITDP

World Enabled+

AUTHORS AND ACKNOWLEDGMENTS

Cover Photo: A man on wheelchair travels in a BRT bus capable of accommodating people with disabilities independently, ensuring the existence of space and priority seats with sufficient dimensions in Peshawar, Pakistan.

Source: Peshawar BRT, ADB

RECOGNITION OF OUTSTANDING CONTRIBUTION FOR TOM RICKERT

ITDP and World Enabled would like to celebrate the career and contributions of Tom Rickert, Executive Director of Access Exchange International, to the Transportation and Accessibility fields. Since the founding of AEI in 1990, he has provided foundational research and tools, and pushed the conversation of accessibility in transport forward for over three decades. Without his tireless advocacy and critical engagement, sustainable transportation research would not have advanced as far. Tom led pioneering technical assistance and advocacy to make cities more accessible and inclusive, and we owe him a debt of gratitude. We wish him well in his retirement, and thank him for his invaluable contributions.

Two people cross a wide, painted street in Guadalajara, Mexico. Source: ITDP.

ACCESS FOR ALL: TRANSPORTATION AND PERSONS WITH DISABILITIES

People of all abilities benefit from clear and wide pathways to move more freely and safely.

The COVID-19 pandemic has transformed our world over the past two years. As we are emerging from this global health crisis, we need to find ways of rebuilding our communities and human settlements. It is important to show true solidarity, care for each other and, most of all, take steps to protect those who are at risk, including persons with disabilities and older people.

Building on the UN Secretary-General's statement on disability inclusion, we need everyone, including persons with disabilities, on board to achieve the Sustainable Development Goals. "Both the Convention on the Rights of Persons with Disabilities (CRPD) and the 2030 Agenda call for placing persons with disabilities at the center of all our efforts, as agents of planning and implementation." According to UN data, of the one billion people with disabilities around the world, 80 percent live in developing countries. The COVID-19 pandemic has deepened pre-existing social and economic inequalities associated with disabilities and threatens to exacerbate them further.

We also need to revisit the way we plan our cities as it has become clear that following standards and adhering to best practices can make human settlements more resilient. Ensuring inclusivity is at the heart of managing cities. Public spaces designed for sustainable mobility and transportation are a great way to rethink our cities.

The case studies presented in this publication promote inclusion and accessibility to ensure a greater level of livability, so that everyone has equal access to transportation, housing and public spaces. Cities need to unlock the potential of everyone and connect people with opportunities to work, share time with friends and family and live safely and independently.

Maimunah Mohd Sharif,
Under-Secretary General & Executive Director
United Nations Human Settlements Programme (UN-Habitat)

ACCESS FOR ALL SERIES

In many cities and regions around the world, the automobile and its related infrastructure have deepened social divisions. They have created a divide between the haves, who have access to the services and opportunities that cities bring, and the have-nots, who are excluded from these. Low-income communities tend to live either farther from their jobs and central business districts or in areas that are poorly served by public transportation. Access is a major challenge in both urban and rural contexts, but this paper specifically addresses the gaps and challenges for people with disabilities in urban land use and transportation.

While there is a trend to design urban centers as areas where people live and work, there is a greater need to build more inclusive, walkable, cyclable neighborhoods around accessible transit hubs. Transit-oriented development (TOD) is grounded in proximity-based planning that enhances walkability. TOD brings together a mix of activities, people, open spaces, commercial uses, and housing options within a reasonable proximity, which enables people to walk, cycle, and take public transport to meet their daily needs. This can reduce access and mobility barriers for individuals, particularly people with lower incomes who may not have access to a motor vehicle, or individuals with reduced mobility such as persons with disabilities, children and youth, older and pregnant people, and caregivers. TOD can be inclusive when both the socioeconomic planning and the physical design planning are intentionally inclusive and accessible to all.

With countries having adopted the Sustainable Development Goals, the Paris Climate Agreement, and the New Urban Agenda, people expect their city governments to respond to and address major issues such as poverty, climate change, and access. The Access for All series opens a dialogue on how transport affects everyone differently, especially communities that at times are discriminated against or lack access to services.

The **Access for All** series distills common messages of inclusion, equity, and access for everyone who can contribute to finding solutions to some of the major challenges facing our cities today, such as sustainability and mobility, while improving quality of life. In this issue of the series, the Institute for Transportation and Development Policy (ITDP) and World Enabled[1] explore accessible **transit-oriented development and sustainable urban mobility (walking, cycling, and public transport) through the lens of persons with disabilities.**[2] In particular, the report examines how land use and transportation planning have failed to account for diverse mobility patterns, lifestyles, and needs of people with disabilities, creating dynamics that widen gaps in societies in both high- and low-income countries. It provides stakeholders from national governments, civil society, subnational authorities, and donor organizations with a brief overview of the aspects of sustainable mobility that affect people with disabilities, and a set of recommendations to promote responsive actions.

Compact, walkable neighborhoods that feature unobstructed and connected sidewalks enable more people to move around, particularly people with disabilities or limited above. An elderly couple stroll along a wide, clear walkway. Source: Shutterstock.

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1   The Victor Pineda Foundation (d/b/a World Enabled) is a 501(c)(3) nonprofit organization based in California.
2   "Disability" is defined in this paper as an interaction of health, functioning, environmental, and personal factors.

ACCESS, PERSONS WITH DISABILITIES, AND THE COVID-19 PANDEMIC

While this publication is not about the COVID-19 pandemic, current realities of the pandemic continue to profoundly impact human life and urban communities. The pandemic stressed social, economic, healthcare, transportation, and all other human-built systems worldwide. It exacerbated the existing inequities and uneven burdens borne by different groups of people in our societies. In doing so, it provided an opportunity to see where, why, and for whom our systems are failing. [3] For persons with disabilities,[4] whose access to opportunities are more limited due to ableist physical environments, social attitudes, and institutional structures that often do not favor them, the restrictions on mobility from the pandemic further limit inclusion and equitable treatment. At the same time, as the pandemic rendered in-person attendance to events, jobs, medical visits, and other services impossible for many people, virtual attendance has increased accessibility for some people with disabilities. This extends only to those able to access digital technologies, while furthering the digital divide for those without. This shift to virtual engagement increased the opportunity for people with disabilities to access workplaces, events, and services. Greater attention to reaching diverse virtual audiences—including language translation, closed captioning, and signing—has also improved accessibility.

There are many ways in which the pandemic negatively affected people with disabilities to a greater degree than people without disabilities. Somepersons with disabilities are more susceptible to severe COVID-19 symptoms, given underlying health conditions.[5] Youth with disabilities are less likely to access education, and the pandemic has further complicated or prevented youth with disabilities from attending school and accessing services such as meal, extracurricular, and health programs.[6] People with disabilities who relied on public transportation for their mobility needs may be limited or unable to use transit due to reduced or changed services, as well as services that cannot practice social distancing.[7] Distancing measures have also posed particular challenges for some persons with disabilities, such as people with visual disabilities not being able to hold onto an assisting person or people with auditory disabilities being unable to read lips because of mask requirements.[8]

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3   It is important to note that there are many gaps in data for gender, disability, and other inequities that result in a lack of understanding and negatively impact the effectiveness of policy and programs aimed at reducing inequities.

4   This publication follows the UN in defining persons with disabilities as "those who have long-term physical, mental, intellectual, or sensory impairments which in interaction with various barriers may hinder their full and effective participation in society on an equal basis with others" (UN, 2006b). Importantly, this definition highlights the role of the environment.
We use the terms 'persons with disabilities', 'people with disabilities', and 'people with disability' interchangeably throughout this paper, following the language of the United Nations Convention on the Rights of Persons with Disabilities (UN CRPD), and international organizations such as the World Health Organization (WHO).

5   CDC. (2021). People with Disabilities.

6   World Bank. (2021). Disability Inclusion.

7   This assumes that there was accessible transport in the first place. Unfortunately, many cities around the world did not have accessible public transportation prior to the pandemic.

8   Gutierrez & Casas. (2021). What Have We Learnt About Building Post-Pandemic Cities for All?

Rapid action in the transportation sector was essential for adjusting to physically distanced mobility. This ensured that essential workers could reach their destinations and essential goods and services could be accessed. However, these rapid actions—such as pop-up cycle lanes, public spaces along streets, and distanced seating on transit vehicles—did not always prioritize universal design. As governments develop short- to long-term recovery plans, these changes must be socially, physically, and institutionally inclusive of persons with disabilities. Persons with disabilities make up nearly 15 percent of the global population, and in low- and middle-income countries (LMICs), almost 20 percent of the population are persons with disabilities.[9] Globally, more than half of all people with disabilities live in towns and cities.[10] Actions and investments must move urban land-use and mobility systems to be more sustainable, resilient to future disruptions, and universally accessible, particularly in cities in LMICs that are growing at a faster rate than cities in high-income countries and are more likely to have a transport supply–demand deficit. Seizing this moment of change and recognizing entrenched inequities as cities rebuild will have an enormous impact on urban inclusion around the world.

Some covid-19 precautions have particularly impacted people with disabilities, such as mask mandates reducing the ability for people with hearing disabilities being unable to read people's mouths. Pictured, three individuals use sign language on public transport in Jakarta, Indonesia. Source: ITDP.

9   Pineda, V. & Dard, B. (2016). The Inclusion Imperative: Towards Disability-Inclusive and Accessible Urban Development.
10   Ibid.

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ACRONYMS AND ABBREVATIONS

AFD — Agence Française de Développement (French Development Agency) (France)

BRT — Bus rapid transit

C4ALL — Cities for All (Global Campaign on Inclusive and Accessible Cities)

Conavi — Comisión Nacional de Vivienda (National Housing Commission) (Mexico)

CRPD — Convention on the Rights of Persons with Disabilities (United Nations)

DisCo Framework — Disability Convention Framework, supporting the implementation of the UN CRPD

GAUN — Gerakan Aksesibilitas Umum Nasional (National Public Accessibility Organisation) (Indonesia)

ICT — Information and communications technologies

IDB — Inter-American Development Bank

ITDP — Institute for Transportation and Development Policy

LMICs — Low- and middle-income countries

MTOP — Ministerio de Transporte y Obras Públicas (Ministry of Transport and Public Works) (Ecuador)

NYC MOPD — New York City Mayor's Office for Persons with Disabilities (United States)

OSM — OpenStreetMap

PAR — Participatory action research

PNMU — Política Nacional de Movilidad Urbana Sostenible (National Policy for Urban and Sustainable Mobility) (Ecuador)

SDG(s) — Sustainable Development Goal(s)

SEDATU — Secretaría de Desarrollo Agrario, Territorial y Urbano (Secretariat for Agrarian, Land and Urban Development) (Mexico)

TOD — Transit-oriented development

UN — United Nations

UN ESCAP — United Nations Economic and Social Council for Asia and the Pacific

WHO — World Health Organization

1. INTRODUCTION

More than one billion people worldwide experience some form of disability, and this number is increasing due to aging populations (from advances in medicine and assistive technologies) and a higher incidence of chronic health conditions.[11] Approximately 80 percent of persons with disabilities[12] live in low- and middle-income countries (LMICs), and about one in five people in LMICs have a disability.[13] [14] This percentage ranges widely globally, with Norway and Ireland at 4.3 percent of their population as persons with disabilities and Swaziland at 35.9 percent.[15] [16] Importantly, **more than half of all people with disabilities live in urban areas,**[17] yet often our cities do not address the mobility needs of all people across the spectrum of abilities. Most cities are designed from the perspective of a nondisabled person and for the convenience of people in motor vehicles rather than people walking, cycling, or using public transportation. Within this context, cities need to reframe for whom they are planning.

When cities plan access for persons with disabilities, they are creating better cities for all. Universal design that enables easier trips for people with disabilities also enables easier trips for people with limited mobility, such as older or pregnant people, young children, and caregivers.

A clear, even sidewalk and road allows two people to comfortably cross the street. Source: Shutterstock

11   WHO. (2020, December 1). Disability and Health.
12   We use the terms 'persons with disabilities', 'people with disabilities', and 'people with disability' interchangeably throughout this paper, following the language of the United Nations Convention on the Rights of Persons with Disabilities (UN CRPD), and international organizations such as the World Health Organization (WHO).
13   UNDESA. (n.d.). Factsheet on Persons with Disabilities.
14   Pineda, V. & Dard, B. (2016). The Inclusion Imperative: Towards Disability-Inclusive and Accessible Urban Development.
15   WHO and World Bank. (2011). World Report on Disability.
16   It is worth noting that this variation in estimates is due not only to variation in the number of individuals with disabilities in a particular area but also to the differences in how disability prevalence is measured per region and country.
17   Pineda, V. & Dard, B. (2016). The Inclusion Imperative: Towards Disability-Inclusive and Accessible Urban Development.
18   Rickert, T. (2003). Making Access Happen: A Guide for Advocates and Planners.

Cities that have neighborhoods with a mix of goods, people, public spaces, mobility options, and services are better for all citizens. And cities that have streets with wide, unobstructed, and designated spaces for walking, cycling, and public transit, as well as safe intersections and street crossings, are better for people with disabilities, but they are also safer, more convenient, and more comfortable for all people.[18] The same can be said of small-scale interventions such as sidewalk ramps, which provide necessary access for some people with disability but also serve people with strollers, rolling luggage, or push carts and others who are carrying goods or caregiving. Urban areas built with persons[19] with disabilities in mind enable people to equitably reach social, health, and economic opportunities; stimulate economies; engage citizenship; and promote thriving communities.

Public transport systems should have accessible stops, stations, and vehicles. Barrier-controlled entry points which do not allow individuals to use assistive devices such as wheelchairs or canes, or require an attendant to assist an individual to enter, are not accessible. At right, two women enter a transOeste BRT station in Rio de Janeiro, Brazil. Source: ITDP.

Cities all over the world—and particularly in Latin America, Africa, the Middle East, and Asia—are experiencing increasing motorization, severe congestion, increasing pollution, safety concerns, insufficient transport supply for travel demands, and socioeconomic exclusion, among other problems.[20] These issues especially affect marginalized groups, including people with disabilities. Studies demonstrate that transportation barriers and exclusion are a predominant obstacle to personal autonomy, education, employment, economic activities, emergency evacuation, and social participation for people with disabilities.[21][22][23] Some transportation barriers that pose particular challenges for persons with disabilities include: obstructed sidewalks or cycle lanes from poor street maintenance; discriminative behavior of other pedestrians, cyclists, passengers, or paratransit/public transit workers; higher proportional cost of cycling and transport;

18   Rickert, T. (2003). Making Access Happen: A Guide for Advocates and Planners.
19   Sze, N., & Christensen, K. (2017). Access to Urban Transportation System for Individuals with Disabilities. IATSS, 66–73.
20   IDB and ADB. (2014). Sustainable Urbanization in Asia and Latin America.
21   Pineda, V., & Dard, B. (2016). The Inclusion Imperative: Towards Disability-Inclusive and Accessible Urban Development.
22   Naami, A. (2019). Access Barriers Encountered by Persons with Mobility Disabilities in Accra, Ghana.
23   Christensen, K.M. (2014). Socially Equitable Community Planning: Including Individuals with Disabilities in the Democratic Association of Place.
24   McClain-Nhlapo, C. V., et al. (2018). Disability Inclusion and Accountability Framework. World Bank.

inaccessible location and design of public spaces, sidewalks, cycle lanes, paratransit, and public transport stops or vehicles; inaccessible street and transit signage; long waiting times; infrequent or time-restricted paratransit or public transit options; and increased cost of travel, including from using private modes of transport.[24] (Barriers are further discussed in Section 2.) If these barriers are not addressed, public spaces and public transportation can be uncomfortable, inconvenient, and unsafe, and this will decrease the likelihood or even make it impossible for people with disabilities to travel around the city.

The inclusion of universal design criteria in designing spaces allows everyone to enjoy them on equal terms.[25] Creating cities with public spaces that are beneficial for all users and enable healthy, safe, and joyful interactions is essential. **This paper explores accessible transit-oriented development and sustainable urban mobility (walking, cycling, and public transport) through the lens of people with disabilities in cities**, including structural and personal barriers, best-practice case studies, and recommendations. Note that this report focuses on sustainable mobility and transportation and does not address needs for private motor vehicles, such as reserved parking. As walking, cycling, and public transportation alongside transit-oriented development provide greater opportunities for community engagement and sustainable, low-cost mobility, this paper prioritizes these modes over private vehicles. Finally, while people with disabilities face major access barriers in rural areas, this paper specifically focuses on accessibility in cities and urban areas.

The Mobility priority pyramid. This image shows the priority that should be given for mobility. The top, with the most space allocated to them, are pedestrians, followed by cyclists, public transport, freight, and finally private vehicles. Unfortunately, most street space is allocated in the reverse.

25   Federación Española de Municipios y Provincias (FEMP) y Fundación ACS. (2014). Guía Dinámica en Accesibilidad. Acción a 360º.

Key Concepts of Accessibility in Urban Mobility

Accessibility describes the degree to which an environment, service, or product allows people to reach their destination, particularly persons with disabilities or others with impediments to mobility such as older and pregnant people, caregivers, youth, and children. Physical accessibility (i.e., the degree to which the physical environment enables a person to reach their destination), economic accessibility (degree of affordability), and social accessibility (degree of social safety and acceptance) all factor into accessibility. Accessibility can be achieved by implementing accessibility standards that define the level of quality accepted as the norm. The principle of accessibility may be mandated in law or treaty and then specified in detail according to international or national regulations, standards, or codes, which may be compulsory or voluntary.[26] For example, in Spain, Law 51/2003 stipulates that 'all goods, environments, projects, services, tools, products, and devices must fulfill criteria to be understandable, usable, and practicable by all people under conditions of safety, autonomy, and comfort'.[27]

Complete trip includes all aspects of a person's trip from the time they begin to plan the trip to arriving at the final destination. This may include: pre-journey planning; access to information and communication technologies (ICTs); payment for transport; access to and from a public transportation stop; waiting, boarding, alighting, and travel inside the vehicle; interchanges and transfer points; return journey planning; and disruptions in the journey. Each complete trip is the sum of its parts, yet each one is different. True accessibility ensures equitable access for each part of a complete trip.

Inclusive design is a methodology that enables and draws on the full range of human diversity and includes and learns from people with a diverse range of perspectives and needs. It considers the full range of human diversity with respect to ability, language, culture, gender, age, and other forms of human difference to serve as many people as possible.[28]

Service quality for transportation includes the perception of the reliability, durability, convenience, comfort, and security of transportation infrastructure and services from the perspective of the owners, operators, and riders of transport systems, as well as the travel behavior of riders. Even if a city has multiple public transportation options to complete trips, [29] [30] [31] if these services have poor quality due to low frequency, overcrowding, or other factors that reduce the reliability, durability, convenience, comfort, or security of the services for riders, these transport services are not improving urban accessibility in practice. In this way, transportation service quality has a direct relationship with transport ridership and perceptions of accessibility.[32]

26   Ibid.
27   Juan Carlos I, King of Spain. (2003). Law 51 of December 2, 2003, on Equal Opportunities, Nondiscrimination and Universal Access of People with Disabilities.
28   Inclusive Design Research Centre, OCAD University. (n.d.). What Is Inclusive Design?.
29   Tabi, C. & Adams, S. (2016). Service Quality and Customer Satisfaction in Public Transport Operations. International Journal of Services and Operations Management 25(4).
30   Fritman, M., Lattman, K., and Olsson, L. E. (2020). Public Transport Quality, Safety, and Perceived Accessibility. Sustainability, 12(9).
31   Litman, T. (2021). Evaluating Accessibility for Transport Planning: Measuring People's Ability to Reach Desired Services and Activities. Victoria Transport Policy Institute.
32   Fritman, M., Lattman, K., and Olsson, L. E. (2020). Public Transport Quality, Safety, and Perceived Accessibility. Sustainability, 12(9).

A **twin track approach** is a two-pronged strategy that includes systemic change and individual accommodation to secure the highest degree of accessibility possible. As defined in the UN Disability Inclusion Strategy, a twin track approach includes "integrating disability-sensitive measures into the design, implementation, monitoring, and evaluation of all policies and programmes and providing disability-specific initiatives to support the empowerment of persons with disabilities."[33] The first approach, systemic change, includes mainstream strategies such as universal design standards and regulations in policy. The second approach, individual accommodation, is targeted and secures accessibility for persons with disabilities through individual-level initiatives. For example, "reasonable accommodation," which is defined by the US Department of Labor as "a modification or adjustment to a job, the work environment, or the way things are usually done during the hiring process… [to] enable an individual with a disability to have an equal opportunity not only to get a job but to successfully perform their job tasks to the same extent as people without disabilities," is required by employers in the U.S. and is an example of this targeted approach.[34]

Universal design is defined by the United Nations as 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… [it] shall not exclude assistive devices for particular groups of persons with disabilities where this is needed."[35] The seven principles of universal design are: equitable use; flexibility in use; simple and intuitive use; perceptible information; tolerance for error; low physical effort; and size and space for approach and use.[36] "Design for all" and "inclusive design" are also popular terms.[37]

(LEFT) Allowing guide dogs in transport stations is an example of how individual accommodation is necessary to secure universal accessibility for all people. Source: Evan P. Cordes, Flickr, (CC By 2.0). (RIGHT) All rapid transit vehicles should feature priority seating and dedicated areas for people with disabilities and individuals with limited mobility. An individual using a wheelchair rides a bus in Seattle, USA. Source: Oran Viriyincy, Flickr, (CC BY-SA 2.0).

33   United Nations. (2019). United Nations Disability Inclusion Strategy.
34   US Department of Labor, Office of Disability Employment Policy. (n.d.). Accommodations.
35   United Nations. (2019). United Nations Disability Inclusion Strategy.
36   Disability Resource Center, University of Arkansas. (n.d.). Universal Design.
37   WHO and World Bank. (2011). World Report on Disability.

2. UNDERSTANDING DISABILITY

Key points:

1 Most people will experience some form (temporary or permanent) of disability in their lifetime.

2 Persons with disabilities are a diverse group of people, including individuals who have difficulty seeing, hearing, walking, climbing, remembering, concentrating, completing self-care, communicating, or being understood.

3 Disability is not an impairment but an interaction of an individual's health and functioning with an unaccommodating social or physical environment.

4 People with disabilities experience discrimination, and this is further compounded by other intersecting identities, such as gender or socioeconomic status.

5 Making environments accessible through universal design benefits not just people with disabilities but everyone, especially those who have limited mobility, such as pregnant and older people, and caregivers with young children.

Most people will experience some form of disability in their lifetime.[38] As defined by the United Nations' Convention on the Rights of Persons with Disabilities (UN CRPD), "persons with disabilities include those who have long term physical, mental, intellectual or sensory impairments, which in interaction with various barriers may hinder their full and effective participation in society on an equal basis with others."[39] While this definition provides an international basis for how to define "persons with disabilities," it is also important to note that disability may be temporary or permanent. These impairments may be visible or invisible. [40]

While disability was previously understood using a medical model, in which an impairment is the disability, the concept of disability is now understood using a **social model instead, which does not center on individual functionality but rather focuses on disability as being an interaction of health, functioning, environmental, and personal factors.**[41] Expressed in a different way, disability is not an attribute of a person but rather an interaction between a given person's difficulty seeing, hearing, walking, climbing, remembering, concentrating, completing self-care, communicating, or being understood, with an unaccommodating physical, social, and/or institutional environment. For example, a person with a visual impairment who is using a transportation system to travel to a local healthcare clinic may experience challenges such as a lack of audio format travel information in the transportation environment, which restricts their ability to use the transport system. The lack of inclusive information in the transportation system is a socially created problem, not an attribute of the individual.[42] **Understanding this complex and social aspect of disability is essential for creating more-inclusive urban environments.**

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38   WHO. (2020, December 1). Disability and Health.
39   UN. (2006b). Convention on the Rights of Persons with Disabilities and Optional Protocol. Article 1.
40   Center for Disability Rights. (n.d.). Disability Writing & Journalism Guidelines.
41   Ibid.
42   Ibid.

2.1 DISABILITY, DIVERSITY, AND DISCRIMINATION

Persons with disabilities are a diverse group of people with a wide variety of experiences. They face a multitude of barriers to equitable participation and inclusion in societies around the world. Women, people of lower socioeconomic levels, and people living in low- and middle- income countries are more likely to be or become persons with disabilities within their lifetime (further discussed in the following sections).[43] [44] As populations age, both older people and those with disabilities will increasingly represent a larger percentage of the total population.

Lack of Safe School Transportation in Low-Income Countries

Lack of access to education severely inhibits the quality of life children and adults with disabilities may attain. In many low-income countries, children with disabilities may not be able to access schools because of long distances, poor road conditions, or lack of accessible transportation. It is not uncommon for school children in low-income countries in Africa, Asia, Latin America, and the Caribbean to use public transportation in place of school transportation, as it can be more accessible. While the scope of this paper is accessible land use and public transportation in urban areas, it is worthy to note this challenge with accessibility to schools.[45]

A diverse group of individuals with disabilities should be represented when assessing the urban environment as all types of factors, such as age, gender, race, and socioeconomic status affect how a person interacts and is interacted with in public spaces. For example, women with disabilities face different challenges than men with disabilities, including increased safety threats and challenges with caregiving demands. Pictured, women with disabilities participate in an accessibility evaluation in Campo Grande, Brazil. Source: Metropole 1:1.

43   UN Women. (2017). Making the SDGs Count for Women and Girls with Disabilities.
44   UN. (2018). Disability and Development Report: Realizing the Sustainable Development Goals by, for, and with Persons with Disabilities.
45   Rickert, T. (2021, 12 October). Personal communication.
46   Bogart, K., and Dunn, D. S. (2019). Ableism Special Issue Introduction. Journal of Social Issues, 75(3), 650–664.

People with disabilities are likely to face discrimination from individuals and institutions based on their disability. Ableism, as defined by Bogart and Dunn (2019), is the stereotyping, prejudice, discrimination, and social oppression of people with disabilities.[46] Ableism can lead to individual discriminatory actions towards persons with disabilities and also become integrated in larger human made structures such as legal, employment, and education systems that do not enable equitable participation and access to opportunities (such as healthcare, jobs, schooling, and political participation).[47] Lack of access to affordable, secure, and inclusive mobility (through walking, cycling, and transport infrastructure and services) and discrimination pose significant challenges for social and economic livelihoods of people with disabilities. These can include:

- **Education:** Children and youth with disabilities are less likely to attend school and on average do not receive as many years of schooling.[48] Girls with disabilities in particular are less likely to receive education, and this impacts literacy and employment rates for women with disabilities.[49] Lack of access to schools not only decreases children's educational and social experiences but may mean that youth with disabilities may not be able to use resources that schools provide, such as assistive technologies, meal and health programs, and extracurricular/recreational activities.[50] Youth who cannot attend school will have a much harder time securing employment as adults.

- **Employment:** People with disabilities can face discrimination in employment application processes and workplace cultures, are more likely to be unemployed, and when employed, earn less on average.[51] In inaccessible areas, people with disability may rely on a family member for care and/or transport, which can limit not only the individual's ability to earn income but also the ability of their family member. This can lead to or exacerbate poverty for persons with disabilities and their families. Women with disabilities are less likely to be employed (and are more likely to experience poverty), which is further discussed in 2.1.2 below.

- **Poverty:** People with disabilities and their families are more likely to be under the poverty line by national and global standards.[52] [53] As noted above, as inaccessible environments can limit the ability of both the person with disability and their family member or caregiver to earn income, inaccessibility affects the whole family's resources, which can cause or exacerbate poverty. Another aspect of this is that persons with disabilities and their families may face additional costs to those incurred by people without disabilities, including higher costs for healthcare or transportation services, among many others.[54] There is no one way of estimating the extra cost of disability, and researchers have found a wide range (represented by percentage of income dedicated to extra costs) globally: 11 percent to 69 percent of income in the United Kingdom; 29 percent to 37 percent in Australia; 9 percent in Vietnam; and 14 percent in Bosnia and Herzegovina.[55]

47   WHO and World Bank. (2011). World Report on Disability.
48   Mcclain-Nhlapo, C. V., et al. (2018). Disability Inclusion and Accountability Framework. World Bank.
49   UNGEI. (2017). Still Left Behind: Pathways to Inclusive Education for Girls with Disabilities.
50   World Bank. (2021). Disability Inclusion.
51   Ibid.
52   UN. (2018). Disability and Development Report: Realizing the Sustainable Development Goals by, for, and with Persons with Disabilities.
53   WHO and World Bank. (2011). World Report on Disability.
54   Ibid.
55   Ibid.

People with disabilities are diversely represented across age, gender identity, sexual orientation, race, ethnicity, class, nationality, and citizenship status.[56] These intersections of identity affect how people with disabilities are able to use, be perceived in, and move around in public space. Two types of intersectionality are discussed in the following sections.

2.1.1 SOCIOECONOMIC STATUS

People with disabilities are more likely to experience economic and social disadvantages. People with disability and their families can experience the intersection of discrimination from ableism for the given disability(s), as well as from classism (which in many countries, such as the United States, can be tied intimately with racism and other prejudices that are reflected in institutional structures). At the same time, people from lower socioeconomic groups are more likely to have or develop a disability in their lifetime.[57]

As socioeconomic status ranges across urban areas, so too do levels of accessibility, affordability, and quality of housing, transportation, and other infrastructure that people will interact with on a daily basis (transportation and disability are discussed further in Section 3). Social and economic gaps across urban areas can often be attributed, in part, to urban planning and transit systems that favor higher-income areas and reflect the socioeconomic hierarchies in societies.[58] As defined by the UN, transport disadvantage (the under-serving of populations in a set geographic area by the transportation system) and socioeconomic disadvantage (which affects people, households, and communities) overlap to cause "transport poverty," which results in inaccessibility and social exclusion.[59] Research has found that persons with disabilities are more likely to experience poverty and live in lower-income neighborhoods that may have less inclusive design, less access to transit, and lower quality of infrastructure given these historic and systematic discriminations and disinvestments in urban planning.[60] At an international scale, accessibility features in metro stations, such as elevators and proper signage, are more common in high-income countries, while a greater percentage of people in low-income countries are persons with disabilities.[61] A lack of transit access or poor-quality, noninclusive design can compound to further decrease access to employment, which is likely to be lower for people with disabilities.

56 Pineda, V., & Dard, B. (2016). The Inclusion Imperative: Towards Disability-Inclusive and Accessible Urban Development.
57 UN. (2018). Disability and Development Report: Realizing the Sustainable Development Goals by, for, and with Persons with Disabilities.
58 UN ESCAP. (2020). Safe and Inclusive Transport and Mobility.
59 Ibid.
60 Beard, J.R., et al. (2009). Neighborhood Characteristics and Disability in Older Adults. The Journals of Gerontology: Series B, 64B(2), 252–257.
61 Fernandes Ferreira, A., et al. (2021). Wheelchair Accessibility of Urban Rail Systems: Some Preliminary Findings of a Global Overview. IATSS, 45(3), 326–335.

Highly visible crosswalks are important to ensure that vehicle drivers can see pedestrians, especially people with disabilities or limited mobility who may require longer to cross the street. An elderly woman crosses a street without clear markings for pedestrian visibility in Guadalajara, Mexico. Source: ITDP.

2.1.2 GENDER

Disability, gender inequality, and discrimination are closely interlinked. While social action for people with disabilities has benefited both women and men, women confront major obstacles to overcoming disabling environments and also in achieving equal outcomes to men who are similarly disabled.[62] Select data from 51 countries shows that only 20 percent of women with disabilities are employed compared with 53 percent of men with disabilities and 30 percent of women without disabilities.[63] Women with disabilities encounter severe disadvantages because of the limited or lack of conditions for physical accessibility and access to information, education, basic health, and rehabilitation services.[64]

According to the World Health Survey conducted in 2004,[65] of adults 18 years and above, one in five women (19 percent) lived with a disability compared to around one in eight men (12 percent).[66] In low- and middle-income countries, women are estimated to comprise up to three-quarters of persons with disabilities.[67] Further, women are more likely than men to become disabled throughout the course of their lives. Gendered studies of disability in the developing world reveal that women and girls with disabilities are: more likely to experience more extreme poverty (given patriarchal property ownership norms and expectation of traditional gender roles in many countries, compounded by disability); less likely to receive aid and resources; more vulnerable to domestic violence and sexual abuse; less likely to receive social services for violence/abuse; less likely to receive education than girls without disabilities; and less likely to be accepted as refugees by high-income countries (e.g., Australia prohibits the immigration of people with disabilities).[68]

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62 Meekosha, H. (2004). Gender and Disability. Sage Encyclopaedia of Disability.
63 WHO and World Bank. (2011). World Report on Disability.
64 Pineda, V., & Dard, B. (2016). The Inclusion Imperative: Towards Disability-Inclusive and Accessible Urban Development.
65 It is worth noting that there is no more recent, comprehensive data for the global population of people with disabilities, and that is needed to better understand and address the needs and challenges of persons with disabilities. The Washington Group of Disability Statistics is an organization dedicated to the development of disability statistics worldwide and to create information that is comparable at a global scale.
66 WHO and World Bank. (2011). World Report on Disability.
67 UN Women. (2017). Making the SDGs Count for Women and Girls with Disabilities.
68 Meekosha, H. (2004). Gender and Disability. Sage Encyclopaedia of Disability.

Transportation and land-use planning must address these inequalities faced by women and girls with disabilities. For example, mobility planning that accounts for the perceptions of insecurity and experience of abuse that women with disabilities are more likely to face when traveling in cities. Insecurity can force women with disabilities to plan longer walking, cycling, and transit routes or avoid travel at certain times of the day.[69] This can impact education and job opportunities, among many other aspects of daily life. In addition, women with disabilities may opt for more expensive forms of transport that are perceived as more secure, such as taxis or similar ride-hail options, subsequently spending a greater percentage of income on more secure mobility options or opting to travel less.[70] Factors that can create a hostile built environment for women with disabilities include: inactive building frontages along sidewalks; lack of lighting for sidewalks, cycle lanes, and paratransit and public transit stops/stations; overcrowding of stations and vehicles; verbal and physical harassment; long waits for paratransit and public transit; travel or stops without staff or security personnel present; or unsafe driving.[71]

Overcrowding on buses, such as in this photo of Cali, Colombia, can decrease feelings from safety for women with disabilities and make onboarding and offboarding more challenging.
Source: ITDP.

2.2 PERSONS WITH DISABILITIES AND ACCESS IN THE INTERNATIONAL POLICY FRAMEWORK

While there is not a universally recognized standard for safe and inclusive mobility for all, there are international agreements that encourage countries to remove transportation barriers for people with disabilities.[72] The foundational framework is the 2007 international Convention of Rights of Persons with Disabilities (CRPD), which outlines accessibility as a right and a prerequisite for the inclusion of persons with disabilities in society. The CRPD states the need to address accessibility and require States Parties to "ensure personal mobility with the greatest possible independence for persons with disabilities." [73]

69   Iudici, et al. (2017). The "Invisible" Needs of Women with Disabilities in Transportation Systems.
70   ITDP. (2019, March 14). In Cairo, ITDP Works to Improve Transport Access for Women.
71   Iudici, et al. (2017). The "Invisible" Needs of Women with Disabilities in Transportation Systems.
72   Humanity & Inclusion. (2018). Making Cities Inclusive: Safe Mobility for Persons with Disabilities in Developing Countries.
73   UN. (2006). Convention on the Rights of Persons with Disabilities and Optional Protocol.

While the CRPD does not have technical guidelines, implementation, monitoring, and evaluation frameworks, it has inspired many national laws protecting access to services for people with disabilities.

The 2030 Agenda for Sustainable Development along with its Sustainable Development Goals (SDGs) and the New Urban Agenda both directly address accessibility. Multiple SDGs address nondiscrimination, including target 10.3, which aims to ensure equal opportunity and eliminate discrimination, and target 16.b, which aims to promote and enforce nondiscriminatory laws in sustainable development.[74] Disability is referenced in seven SDGs, and SDG 11 specifically mentions developing affordable and accessible transport systems for women, children, people with disabilities, and older people.[75][76] The New Urban Agenda mentions providing access for persons with disabilities, on an equal basis with others, to affordable and safe public transport options to ensure universal sustainable mobility.[77] While the SDGs focus on national goals for monitoring development, the New Urban Agenda is a global guideline for action to implement sustainable urban development (SDG11) over the next 20 years.[78] Even though these agreements are nonbinding, with no direct relationship with other bidding agreements such as the CRPD, they create an international platform and benchmark to translate rights into participatory processes and inclusive infrastructure systems. The UN Decade of Action for Road Safety and the Sendai Framework for Disaster Risk Reduction 2015–2030 are two additional frameworks that specifically identify inclusive action for persons with disabilities.[79][80]

In addition to international policy frameworks, international and nongovernmental organizations play an important role in garnering support and fostering action through guided actions such as campaigns, learning exchanges, and programs. For example, the Cities for All's Global Compact on Inclusive and Accessible Cities (C4All) is a declaration that aligns key commitments to accessibility, universal design, and inclusion within The Sustainable Development Goals, The New Urban Agenda, The Convention on the Rights of Persons with Disabilities, and the WHO's Age-friendly Cities framework. **The #Cities4All campaign commits signatories to six principles:** No discrimination, Accessibility, Participation, Inclusive Urban Policies, Capacity Building, and Data for Development.[81] In Section 5, we highlight how the case studies illustrate these six principles.

74   UN. (2019). Disability and Development Report.
75   UNDESA. (2016). Good Practices of Accessible Urban Development. UN.
76   UN. (2015). Transforming Our World: The 2030 Agenda for Sustainable Development, 21 October 2015, A/RES/70/1.
77   UN. (2016). The New Urban Agenda.
78   Mcclain-Nhlapo, C. V., et al. (2018). Disability Inclusion and Accountability Framework. World Bank.
79   WHO. (n.d.). Decade of Action for Road Safety 2021–2030.
80   Mcclain-Nhlapo, C. V., et al. (2018). Disability Inclusion and Accountability Framework. World Bank.
81   Cities for All. (n.d.). Cities for All.

World Enabled supported the introduction of inclusion and accessibility principles to the drafting of the New Urban Agenda and the outcome declaration of World Urban Forum 9 (WUF9) in 2018 in Kuala Lumpur. As part of the official event program for WUF9, World Enabled organized an aerial art project, forming the phrase "Cities for All" using umbrellas with the help of civil society groups and individuals, including persons with disabilities. The Cities for All Campaign (www.Cities4All.org) was launched on December 3, 2018. Source: World Enabled, 2018.

3. ACCESS AND MOBILITY FOR PERSONS WITH DISABILITIES

Key points:

1 People with disabilities have distinct challenges and needs in cities. These can be better accommodated through inclusive urban design.

2 Physical, social, and institutional barriers prevent persons with disabilities from using urban environments and transportation systems in cities around the world.

3 Cities can improve access for all with inclusive transit-oriented development and robust transportation systems that benefit persons with disabilities, people with limited mobility such as older people, and those that travel more slowly, such as caregivers and children.

People with disabilities and their families are more likely to have lower incomes, face social exclusion and socioeconomic disadvantages, and dedicate a greater percentage of income to daily needs such as transportation, housing, goods, and services. Given these challenges, people with disabilities benefit greatly from urban planning and design that eliminates physical barriers, reduces economic burdens, encourages social engagement, provides community resources, and reduces the length and stresses of travel. The following sections identify how proximity-based land-use planning and inclusive transportation planning can provide senses of security, belonging, health, and joy for people with disability and their families.

3.1 IMPROVING ACCESS THROUGH LAND USE

Land-use planning affects all aspects of daily living. When land-use planning is proximity-based, mixed-use, and transit-oriented, this enables shorter trips by walking, cycling, and public transit. Areas that are less dense, more segregated, and more dependent on private automobile travel often have longer trips. For people with disabilities who face greater challenges making trips, reducing the length of trips and improving the accessibility of the built environment is essential. Reducing average trip length better accommodates slower movement, and is less time and money-intensive, all of which reduce mobility stressors for people with disabilities. The following subsections discuss the intersection of land-use planning and disability, highlighting transit-oriented development (TOD) and compact neighborhoods as solutions to improving access for people with disabilities and limited mobility.

TOD enables equitable access to opportunities and services through eight core principles of sustainable access and mobility, urban design, and land use, namely: **WALK, CYCLE, CONNECT, TRANSPORT, MIX, DENSIFY, COMPACT,** and **SHIFT**. To learn more, please visit todstandard.org.

Figure 2: The Principles of TOD
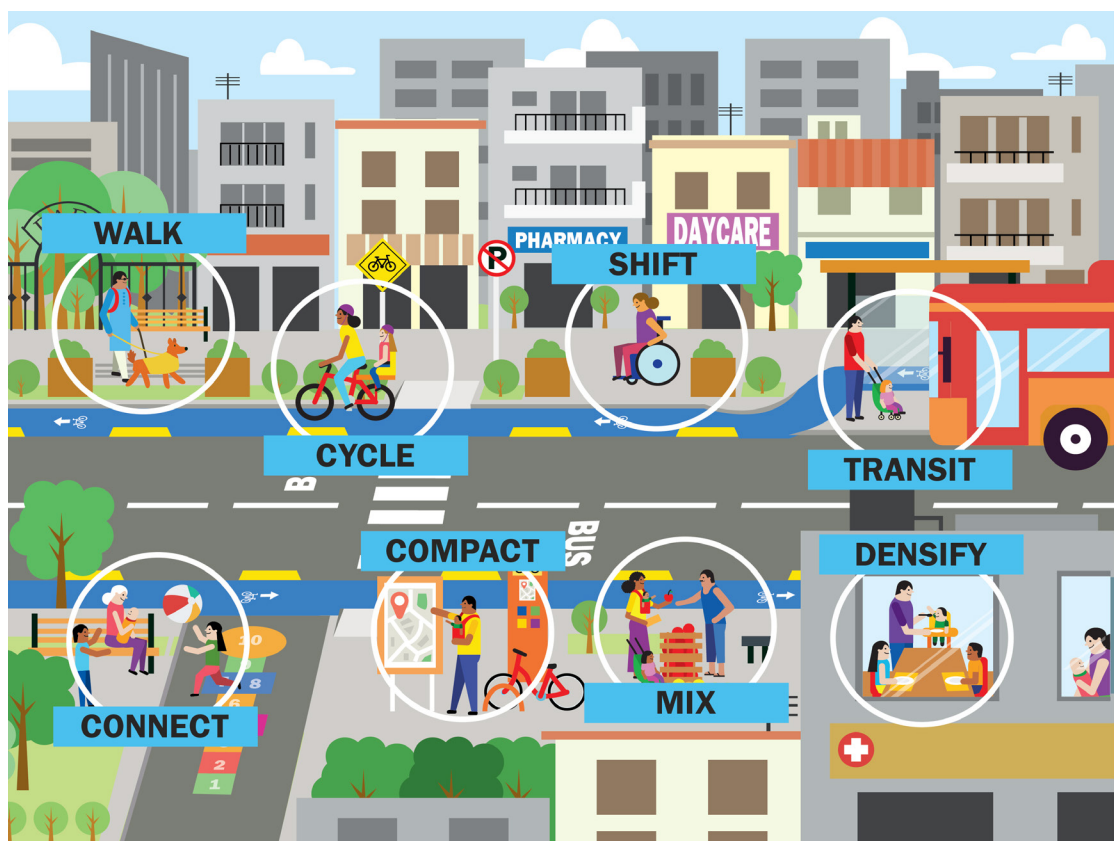
3.1.1 NEEDS FROM LAND USE

Land-use planning determines where goods, services, education, healthcare, social activities, areas for leisure, and housing are available in cities. The quantity, location, and distance between these uses all influence how people operate and interact in cities. People with disabilities and their families need land-use planning to provide:

- The ability to form social ties and be a part of community engagement activities (such as through community centers and local groups);

- A sense of belonging and inclusion;

- Calm environments that do not cause undue stress; and

- An assurance of safety and security.

Inclusive, transit-oriented development enables community building by reducing physical distances between individuals, public spaces, activities, and community resources. It also brings people together in public spaces by reducing car-based travel and creating calmer environments that encourage independent mobility and community interaction.

In addition to understanding social needs that inclusive land-use planning can address, it is important to understand the key destinations that people with disabilities need to access on a frequent basis. Key destinations and mobility options, and the importance of their being fully accessible to people with disabilities and their families, include:

Water, sanitation, and hygiene (WASH) locally: Accessible WASH services are the base minimum for healthy environments and enable more flexibility and confidence with daily trips to goods, services, and social and economic opportunities.

Affordable supportive and/or mixed-income housing: People with disabilities often face higher daily living costs as well as lower incomes in comparison to the general population, and they and their families benefit from access to affordable and mixed-income housing options.

Accessible transportation: Persons with disabilities may be more reliant on walking and public transportation, have lower incomes, and spend a greater percentage of their income on transportation in order to have safe and accessible mobility. It is important, therefore, that transportation is physically, socially, and financially accessible.

Local fresh food sources, including grocery stores, small shops, and informal fruit and produce stands: All people should have access to fresh food within an accessible, walkable and cyclable distance.

Variety of open spaces, including parklets, plazas, green spaces, and playgrounds: Public spaces for leisure, play, and social interaction should be physically and socially accessible, meaning that their physical design allows all people with disabilities and 28 those with limited mobility to physically reach and enjoy locations (such as accessible paved paths in parks rather than gravel) and social environments are inclusive.[82]

Healthcare services and pharmacies: People with disabilities may require more frequent access to healthcare and pharmacies given underlying health conditions.

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82 Development that is centered on providing accessible parks, plazas, and other forms of public and green spaces is better for community health by reducing air pollution and stress, as well as increasing mental health. This is so important, in fact, that the government of Singapore released The Singapore Green Plan 2030, which aims for all households to be within a 10-minute walk of a park and designate 50% more of Singapore's land to parks by 2030. Singapore Government. (n.d.). Singapore Green Plan 2030.

Education options: People with disability are less likely to receive education, given barriers in the physical environment to accessing schools and universities,[83] social discrimination and harassment, and institutional barriers within the schooling systems. Proximity-based planning cannot address the social and institutional barriers, but it is imperative that physical barriers to education are eliminated.

Employment options: Persons with disabilities are less likely to be employed than people without disabilities. When an array of employment options are at accessible, walkable distances, that reduces barriers to employment opportunities for persons with disabilities and their families.

Cultural and community centers, including social services: Support and socialization are important services that cultural and community centers provide. These benefit everyone but may have particular importance for people with disabilities, who are more likely to be in poverty, unemployed, and/or unable to attend schooling.

These needs and services should form the basis of the neighborhood, and all people in a city should be able to access them equitably. For persons with disabilities, it is not only proximity but accessible proximity to opportunities, goods, and services that matters. Urban design that provides inclusive access to goods, services, and social and economic opportunities improves social ties among people by reducing physical distances between individuals, public spaces, activities, and community resources.

Diverse services and land uses also cater to the needs of persons with disabilities to help with daily routines, employment, and recreation. Traveling can be more exhausting for people with disabilities, so compact, mixed-use development can reduce travel distances to necessary goods and services. Source: Hector Rios.

83   See Lack of Safe School Transportation in Low-Income Countries on page 14.

3.1.2 CHALLENGES FROM LAND USE

Car-oriented, low-density urban form: When urban areas are sprawled and do not have a good density of mixed uses for diverse incomes, people travel farther distances for daily necessities. Low-density cities and towns with longer distances between destinations induce motor vehicle usage, increase greenhouse gas emissions, and decrease air quality. Sprawl particularly restricts mobility of those without motor vehicles or people with limited mobility. In addition, sprawl increases inequalities and social exclusion through segregation of urban areas.[84] These negative effects of low-density development can especially impact people with disabilities, children, and older people, who are already more limited in their mobility and tend to rely more on walking, cycling, and public transportation.

Dense, walkable urban form without universally accessible design and policy: As cities move toward building more dense, walkable, and cyclable neighborhoods, this only achieves goals of increasing access if physical, social, and economic accessibility are part of this planning. Inclusive (i.e. universally accessible) planning makes TOD better by ensuring diverse perspectives have a voice in planning, and universal design policy principles are implemented.

The following table identifies different barriers from non-inclusive land-use planning.

Table 1: Barriers from Non-inclusive Land-use Planning

Physical environment	• Long distances and/or inaccessible design between goods, services, education, and social/economic opportunities, such as walkways and crosswalks that are narrow, obstructed, steep, or uneven. • Motor vehicles are the primary mode of travel and a large portion of land use in the city is dedicated to them. • Public spaces are inactive and/or dark for long periods of time. which can cause feelings of discomfort or insecurity. • Overcrowding in public spaces and streets.
Institutional environment	• Lack of affordability of transportation and supportive/mixed-income housing. • Lack of community/housing programs or subsidies for families with a disabled member. • Lack of inclusiveness and accessibility policies for building and land use design, including lack of protective accessibility policies for housing and transportation.

84   ITDP. (2019). Final Report High-Volume Transport: Urban Transport Theme 2.

3.1.3 DISABILITY-INCLUSIVE LAND USE

Prioritizing inclusive, mixed-use, walkable, and cyclable development in cities increases access for all, including persons with disabilities.[85] Transit-oriented neighborhoods and buildings have the potential to create inclusive cities by facilitating more trips through walking, cycling, and low-cost public transport. At the same time, if TOD is not enacted with inclusive policies and planning, it can displace people with disabilities, who on average have lower incomes. In this way, it is important that cities understand both the potential problems as well as the possibilities of TOD for people with disabilities.

TOD can improve access to activities and relieve some of the stress that comes from longer trips for people with disabilities. In addition, when all people can access necessary goods and services by means of safe, unobstructed walk/ cycle ways and public transit, this enables safer communities because there are fewer motor vehicle crashes, more active communities with improved physical and mental health, and calmer environments with less noise and air pollution. It also enables people to spend less money on high-cost private transportation. These aspects of TOD are beneficial for all.

Inclusive transit-oriented development and land use planning will include:

- **Universal accessibility standards for urban design, development, and transportation infrastructure:** For compact, transit-oriented neighborhoods to facilitate access for all, all pedestrian, cycling, and public transport infrastructure, as well as public spaces, must be universally designed. ITDP's *TOD Standard* provides additional information for how transit-oriented development benefits communities, and it instructs users about how they can evaluate their own cities.

- **Affordable social housing and low-income housing for persons with disabilities:** People with disabilities and older people may face higher daily living costs as well as lower incomes in comparison to the general population.[86] Specific housing that is inclusive of physical, social, and economic needs of people with disability and older people is therefore important in city development and TOD planning.

- **Planning for diverse services for people of all incomes:** If TOD neighborhoods only feature mixed housing and not diverse services for people with a variety of incomes, people will still need to take long trips outside of the neighborhood to access affordable goods and services. This ruins the intent to promote walkable and cyclable environments in accessible TOD communities.

- **Planning for mixed land uses:** There should be a focus on providing a mix of land uses that bring together goods, services, and other destinations to encourage walking, such as bringing cafés/restaurants, retail, residential units, schools, and public and green spaces within walkable distances of one another.

85   ITDP. (2017). TOD Standard.
86   WRI. (2017). Governance of Inclusive Transit-Oriented Development in Brazil.

- **Local business retention programs:** As above, businesses along with people may be priced-out and displaced as a community increases access to goods, services, transit, and opportunities. Programming to support and retain local businesses can reduce this trend, and when businesses are maintained, this supports existing community ties and places of interaction and connection. It may be necessary to support local businesses to retrofit their building to meet universal accessibility standards.

-
   Community engagement spaces, programs, and accessible public spaces: Supportive programs and social connections offered through community centers and public spaces foster local community ties that enrich neighborhoods and provide social and educational opportunities for residents.

Urban design standards should address physical, sensory, cognitive, and social barriers for physical and social environments. Inclusive land use design should include:

- Adequate walking and cycling networks featuring a connected grid of streets and paths that supports short trip distances between diverse land uses and accessible design between goods, services, education, and social/economic opportunities.

- Compact, diverse developments well connected through universally accessible 10-minute transit, walking, and cycling networks.

- Public and green spaces widely available in every neighborhood, and accessible through walking, cycling, and transit.

- Urban design that ensures public spaces and commercial/residential developments are accessible to everyone, and that there are clear inclusion policies specifically targeting people with disabilities and those with limited mobility for urban development and housing standards.

To achieve this, institutional environments must enable the creation, implementation, and enforcement of these standards, which is further discussed in Section 4.

3.2 IMPROVING ACCESS THROUGH SUSTAINABLE MOBILITY

Accessible walking, cycling, and public transportation should be the backbone of urban mobility. Universal access to public transportation gives people, and especially those with disabilities, greater independence, access to more areas of a city, and improves quality of life. At present, public transport often inadequately serves people with disabilities.

People with disabilities travel less, but they rely on driving, being driven, and public transport services more on average than people without disabilities. [87] [88] In the United States, private vehicles and walking are the top two transport modes for people with disabilities, and people with disabilities also use public transit for a greater percentage of trips than people without disabilities.[89] People with disabilities travel less on average not because they have less need to travel but rather because of transportation systems that fail them. If public spaces and transportation infrastructure (physical, social, informational) are not universally designed, the built environment and the transportation system can pose enormous barriers to reaching essential goods and services. The following sections identify barriers and opportunities for sustainable urban mobility to fulfill daily needs of people with disabilities.

Road Safety and Disability

Injuries from road crashes are a major cause of disabilities, particularly for young pedestrians.[90] Road collisions leave people with permanent disabilities in many countries, such as 25 percent of all people in road collisions in Belgium and 40 percent in the Democratic Republic of the Congo.[91] Improving land use and shifting to sustainable mobility is important for the safety of all people in cities.

3.2.1 MOBILITY CHARACTERISTICS AND NEEDS

Persons with disabilities have specific travel characteristics and needs based on the types of trips they need to take, when they take them, and under what conditions. It is important to reiterate that people with disabilities are a diverse group of people with distinct needs, and this section identifies multiple and different types of mobility characteristics.

87   Bezyak et al. (2017). Public Transportation: An Investigation of Barriers for People with Disabilities.
88   Wheels for Wellbeing. (2019). A Guide to Inclusive Cycling.
89   US Bureau of Transportation Statistics. (2021). Travel Patterns of American Adults with Disabilities.
90   TUMI & UKAid/HVTP. (2019). Disability-Inclusive Public Transport: Practical Steps to Making Public Transport Disability Inclusive.
91   WHO. (2018). Global Status Report on Road Safety 2018.

Figure 3: Transportation Planning and Mobility for People with Disabilities

Use of assistive devices or animals.

a)

Need for shorter trips, given increased discomfort, stress, or difficulty to travel.

b)

Slower travel speeds. Persons with disabilities may need wider walkways for passing and longer boarding times to accommodate slower movement.

c)

More frequent stopping, given increased fatigue, confusion, or stress in travel.

d)

Need for calmer environments, including low noise levels, reduced crowding, and ample access to green spaces.

e)

Higher risk aversion. Persons with disabilities are more likely to choose travel options they perceive as safer, despite increased costs or restricted schedules.

f)

a) Alika Obraz via Shutterstock
b) Oran Viriyincy via Flickr
c) ITDP Mexico
d) ITDP Mexico
e) muroPhotographer via Shutterstock
f) New York City Department of Transportation via Flickr

3.2.2 BARRIERS TO URBAN MOBILITY FOR PEOPLE WITH DISABILITIES

People with disabilities can face a multitude of barriers for a complete trip. These can be barriers from the physical environment that prevent mobility; barriers from the social environment that do not provide comfortable social interactions; or barriers from the institutional environment such as a lack of institutions dedicated to improving disability accessibility. Specific examples of barriers for sustainable transportation include:

Table 2: Barriers from Non-inclusive Sustainable Transportation[96]

Physical environment	• Narrow, obstructed, steep, or uneven sidewalks, ramps, or crossings[92]
	• Limited, overly complex, misleading, or a lack of wayfinding signage or infrastructure (e.g., overly complex maps or station design, no high contrast and/or tactile paving)
	• Poor maintenance of urban elements (e.g., surfaces in disrepair or impractical location of street furniture, such as in the middle of a sidewalk)
	• Lack of wide, protected cycle infrastructure (lanes, parking) that enables adapted and/or co-rider bicycle options
	• Inaccessible transport vehicles or stations/stops:
	  — no priority seating and/or spaces for wheelchairs
	  — no assistive device or ramp for access
	  — vertical or horizontal gaps to get into vehicles
	  — station entrances that require an attendant to open them, such as some gates or turnstiles
	• Pedestrian bridges or below-ground street crossings, especially those without elevators or ramps, which pose barriers with added travel distance and time
	• Vehicle failures (e.g., assistive technologies failure)
	• Low/lack of street lighting
	• Lack of audio signals for crossing
	• Lack of clear audio and high-contrast visual trip planning information, including audible in-vehicle next-stop announcements
	• Overcrowding of walkways, vehicles, or other shared spaces

92 When sidewalks parallel to bike lanes are poorly designed or maintained, people with disabilities (particularly those who use a wheelchair) may use the bike lane if it is well-designed, is not obstructed, and feels safer. This can be dangerous given the speed of cyclists, and is an example of how inaccessible sidewalks can force persons with disabilites into unsafe situations or prevent their mobility completely.

96 Adapted from TUMI & UKAid/HVTP. (2019). Disability-Inclusive Public Transport: Practical Steps to Making Public Transport Disability Inclusive and UN Economic and Social Council for Asia and the Pacific. (2020). Safe and Inclusive Transport and Mobility. Additional information from: Naami, A. (2019). Access Barriers Encountered by Persons with Mobility Disabilities in Accra, Ghana; Stjernborg, V. (2019). Accessibility for All in Public Transport and the Overlooked (Social) Dimension—A Case Study of Stockholm.; and ITDP. (2019, March 14). In Cairo, ITDP Works to Improve Transport Access for Women.

Social environment	• Harassment and discrimination by frontline staff and other passengers frequently inhibit the experience of people with disabilities in public transport stations and vehicles, as well as public space (e.g., drivers who are unwilling or resistant to using accessibility equipment)[93] [94] • People with invisible disabilities may face discriminatory questioning or harassment when using accessible programs and infrastructure • Concerns from people with disability with safety of overcrowded stations and vehicles, lack of monitoring, time waiting at stops or stations, travel or stops without staff or security personnel present, or inadequate lighting all serve as barriers[95]
Institutional environment	• Lack of institutional leadership and capacity (financial, administrative, technical, personnel) for maintenance (e.g., maintaining sidewalks so they are unobstructed, ensuring assistive technologies are functional onboard vehicles), operations (e.g., training staff in use of assistive technologies and inclusive attitudes toward all riders and their diverse needs), and enforcement (e.g., ensuring that universal design elements are functional and useful) • Lack of persons with disabilities in decision-making and planning roles, including a lack of professional planners with disabilities and lack of persons with disabilities in public engagement (which may be in part to inaccessible forums for receiving passenger/public feedback about projects and infrastructure) • Lack of affordable programs for public transportation fares for people with disabilities and those with limited mobility, such as the elderly

To achieve accessible mobility, all aspects of public transportation systems and public spaces need to be designed for the needs and comfort levels of the most vulnerable and underserved passengers, particularly including riders with disabilities.

93 Stjernborg, V. (2019). Accessibility for All in Public Transport and the Overlooked (Social) Dimension—A Case Study of Stockholm.
94 This may be a particular challenge for paratransit operators, especially if they are compensated per passenger, as there is little economic incentive to pick up people with disabilities who may require more time to board and/or occupy more space (with assistive devices such as wheelchairs).
95 Iudici et al., (2017). The "Invisible" Needs of Women with Disabilities in Transportation Systems.

Narrow, obstructed walking paths prevent all people, particularly people with disabilities from moving around safely in cities, or traveling at all. Two-wheelers block an uneven path in Pimpri-Chinchwad, India. Source: ITDP.

Broken sidewalks with uneven surfaces, such as this one in Nairobi, Kenya, also discourage people with disabilities and those with limited mobility from walking. Source: ITDP.

Inaccessible sidewalks leading to public transport stations and stops are major barriers to public transport use for people with disabilities. The photo illustrates how weather conditions can further limit access, such as this sidewalk in Addis Ababa, Ethiopia. This also highlights the critical importance of maintenance of infrastructure and services. Source: ITDP.

3.2.3 DISABILITY-INCLUSIVE SUSTAINABLE MOBILITY

Walking, cycling, on-demand shared services like ride-hail and taxis, and public transportation (both formal and informal) can be safe mobility options for persons with disabilities. For this to be true, universal design measures in walking, cycling, and public transportation systems should not only be fully accessible but comfortable and easy to use, with the goal of facilitating independent mobility. For example, providing an accessible, wide gate entrance alongside inaccessible turnstiles in a transit station that can only be opened and operated by staff allows for some measure of accessibility, but using this can take an extended period of time, can be inconvenient, and can impose social pressures for persons with disabilities when traveling independently. In the same way, it is not a holistic solution to have staff assist people with disability instead of providing an autonomous solution. In both cases, dependence on others for access can deter persons with disabilities from frequently using an area or service. Cities must prioritize universal design measures that are not only accessible but convenient, comfortable, and independent.

The main modes of sustainable transportation and their ability to foster access are discussed below. Best practices are further detailed in Section 4.

Walking and sidewalks: Most trips involve walking. Walking can positively impact physical and mental health, as well as quality of life. [97][98][99] When street environments are calm (no or low-speed vehicles, low noise levels, see-through building frontages, trees and foliage, and other measures that make streets more pleasant and less dangerous for people), pedestrians traveling at various speeds can comfortably reach their destinations.

BEST PRACTICES: WALKING

- Smooth, wide, barrier-free sidewalks and crossings with sufficient space for moving through, turning, and waiting using a wheelchair (minimum sidewalk width of at least 2 to 2.5 meters, and 4.5 meters in high-intensity commercial zone, because wheelchair users require at least 1.5 meters to turn around and 1.8 meters to pass another wheelchair users)

- Low grades if changing surface heights at crossings and entrances to buildings or stations (ramp gradient of 1:12–1:20 and minimum clearing of 1.5 x 1.5 meters)

- Traffic-calming measures to create slow traffic and a comfortable environment

- Physically permeable buildings with visually active frontages (i.e., multiple entrances to commercial and residential uses along a street that break up large blocks, with the ability to see in and out of buildings to encourage more "eyes on the street")

- Limited driveways so as to avoid interrupting the pedestrian pathway

- No street furniture or debris in the pedestrian zone of the footpath (the section of the sidewalk that is designated for pedestrian movement, as shown in Figure 9 below)

- Tactile markers and raised crosswalks, level with sidewalks, or smooth transitions from raised sidewalks to street-level crosswalks at every pedestrian crossing

- Street furniture and shade/shelter for pedestrian rest and comfort, with a maximum distance of 50 to 150 meters between resting areas with street furniture[100]

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97 We include all persons with disabilities when referencing walking, including individuals using wheelchairs or other assistive devices.
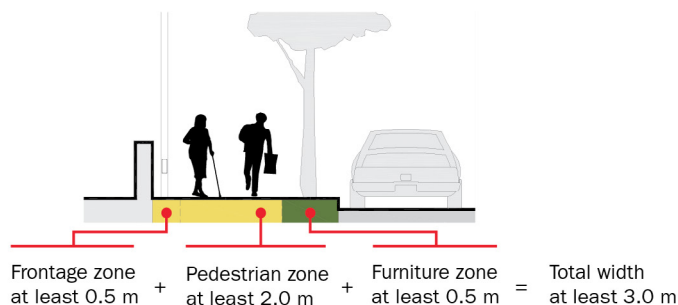98 CDC. (2020). Physical Activity for People with Disability.
99 Kelly, et al. (2018). Walking on Sunshine: Scoping Review of the Evidence for Walking and Mental Health. TUMI & UKAid/HVTP. (2019).
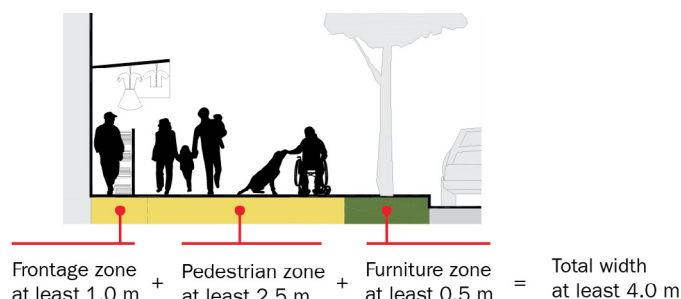
The sidewalk is a multifunctional space with three main activity zones: a frontage zone in front of buildings for people to enter and exit, linger, and look; a pedestrian zone that allows through movement; and a furniture zone that is a place for trees, lighting, and places to stop and sit. The spatial need for each depends on the type of area it is in, such as residential or commercial, and the types of volumes of pedestrians anticipated there. Source: Streets for Walking and Cycling in African Cities, ITDP 2018.
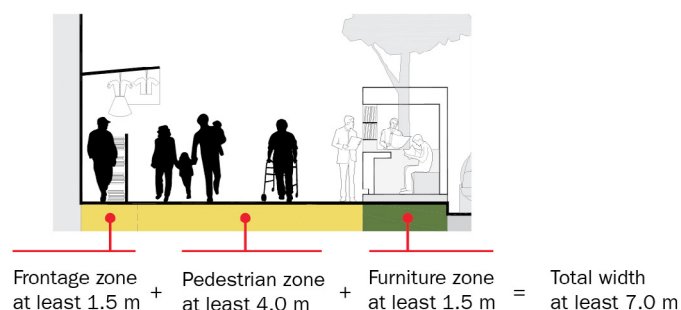
Residential zone

| Frontage zone at least 0.5 m | + | Pedestrian zone at least 2.0 m | + | Furniture zone at least 0.5 m | = | Total width at least 3.0 m |

Commercial zone

| Frontage zone at least 1.0 m | + | Pedestrian zone at least 2.5 m | + | Furniture zone at least 0.5 m | = | Total width at least 4.0 m |

High-intensity commercial zone

| Frontage zone at least 1.5 m | + | Pedestrian zone at least 4.0 m | + | Furniture zone at least 1.5 m | = | Total width at least 7.0 m |

Cycling and cycle lanes: Cycling is a low-cost, low carbon option to travel, with positive benefits for physical and mental health. Many persons with disabilities cycle, as it can be easier than walking or more accessible than taking public transport. Transport for London reports that 19 percent of people without disabilities cycle and 12 percent of persons with disabilities cycle.[101] While this percentage ranges by country and city, cycling infrastructure must accommodate inclusive cycling. People with disabilities may face physical and attitude barriers to cycling that can be mitigated with appropriate infrastructure, education, and training. There are many types of nonstandard cycles that can provide good options for persons with disabilities, elderly people, young children, families, or businesses to cycle, such as handcycles, recumbent bikes, cargo bikes, tricycles, e-bikes, bikes with trailer attachments, or tandem bicycles.[102]

This sidewalk in Kisumu, Kenya, which is wide, even, well-maintained, and unobstructed is an example of an accessible walking path. Source: ITDP.

101 Wheels for Wellbeing. (2019). A Guide to Inclusive Cycling.
102 Ibid.

BEST PRACTICES: CYCLING

- Cycle lanes should be physically protected, with a physical barrier such as planters or bollards between vehicle traffic lanes and cycle lanes, to avoid encroachment by vehicles

- Pedestrian paths should be unobstructed, wide, and well-maintained to avoid individuals using cycle lanes where pedestrian infrastructure is insufficient

- Access control points (such as bike entrances to parks) should be a minimum of 1.5 meters to 2 meters to accommodate diverse types of cycles

- Cycle tracks should be wide and clear. One-way cycle tracks should be 2 meters to 3 meters, and two-way cycle tracks should be 2.8 meters to 4 meters, to accommodate adaptive bicycles as well as passing

- Streets should feature traffic-calming measures to create slow traffic alongside cyclists

- Intersections should feature safe cycling design, including high contrast coloring, bike boxes, and other elements which increase the visibility of cyclists for vehicle drivers and pedestrians

- Cycle parking stations should offer parking stands or bays that are a minimum of 1.5 meters[103]

A child with a disability rides a tricycle comfortably in Vietnam. Source: Richard Nyberg, USAID, via Wikimedia Commons.

103 Ibid.

Public transport: Informal public transport, like autorickshaws, jitneys, and minibuses, and formal public transport, like buses, bus rapid transit, light rail, and heavy rail transit, can enable people with disabilities to travel longer distances in urban areas. However, public transportation is often not fully accessible and can cause stress, confusion, or concerns with security. This may occur if vehicles are overcrowded, there is insufficient seating or designated space for wheelchair users, stations or stops are inaccessible, there are long wait times, or there is a lack of clear, intuitive information available. In addition, it is important to emphasize that having a fully accessible system is critical, because even if new corridors are constructed with more attention to disability, they can end up as islands within an inaccessible transport network. Accessible physical infrastructure in and around vehicles and stations is also essential.

Good examples of tactical wayfinding signage and tactical paving for the MyCITI rapid transit system in Cape Town, South Africa. Source: Susan Smit, Angela Gilbert, and Pierre Smit from Smit & Davies, 2012.

Well-designed transport stations reduce vertical gaps with platform level boarding. Source: ITDP.

BEST PRACTICES: PUBLIC TRANSPORT

- Smooth, wide, barrier-free sidewalks and raised crossings in and around stations and stops (minimum sidewalk width of at least 2 to 2.5 meters, and 4.5 meters in high-intensity commercial zones)

- Low grades if changing surface heights (ramp gradient of 1:12–1:20 and minimum clearing of 1.5 x 1.5 meters)

- Accessible vehicles with no vertical or horizontal gaps (which can be facilitated through infrastructure or technology that corrects drivers) with color contrasts on step edges and handholds, and assistive ramps or lifts available

- Barrier-free stops and stations with sufficient space for moving through, turning, and waiting using a wheelchair, as well as ample seating and places for rest

- For transit stops and stations, accessible entrances (including turnstiles) and payment/ticketing machines that do not require attendants for people with disabilities to pass through and use

- Maintenance of sidewalks and cycle ways in and around transit stops/stations

- Public, accessible toilets in transport stations

- Traffic-calming measures to create slow traffic and a comfortable environment

- Adequate lighting

- Clear information in all stops, stations, and vehicles about trip planning, routes, system maps, payment, wayfinding, announcements, and vehicle location. Information should be available in multiple accessible formats (such as braille on payment machines, audible instruction onboard vehicles and stops, and tactile paving in stations)

- Accessible audio and visual formats for all information and communications technologies (ICTs), such as audio guidance for next-stop information, available on apps on phones as well as onboard vehicles and in stations

- Tactile marking at crossing points

- Guide dogs allowed in all public spaces, facilities, and transport systems

- Supportive staff, security personnel, and drivers available to assist with wayfinding and loading/unloading

- Mechanism for people to file complaints or report harassment with transit operators/the city and a process to address the issues raised in a timely and effective manner

Urban Design Spotlight: Accessible Platform-Level Boarding Technology in Mexico City

The Metrobús (BRT) in Mexico City provides an example of how to ensure platform-level boarding through specialized technology. The Metrobús system has a high frequency and while the platform is the same height as the bus floor to reduce vertical gap, the system also features a special button at stations that can be pushed to visually alert the driver that an assistive device such as wheelchair or a person with other mobility need is waiting at the station so they can make sure to reduce the gap when loading and unloading.

The Mexico City BRT enables access with center-aligned stations that have smooth walkway transitions from the street to the station and a low gradient ramp to enter the station. Source: Steve Boland, Flickr, (CC BYNC- ND 2.0).

There is no vertical or horizontal gap between the station platform and the bus floor, due to assistive driving technologies, considerate design, and attentive drivers. Having no gap makes boarding possible for all people, including people with disabilities and limited mobility. Source: Mariana Gil / EMBARQ Brasil, Flickr, (CC BY-NC 2.0).

On-demand Shared Services: On-demand and door-to-door shared services, including on-demand ride-share services, state-provided services, and 2-, 3-, and 4- wheeled taxis, are important components to an urban transportation system, facilitating more atypical or arduous journeys. They often fill important gaps in the public transportation system, especially when that is not universally accessible. Because of the way our systems have been designed, these are often the only services that persons with disabilities can use. People with disabilities may rely more on being driven to destinations, particularly with door-to-door services. [105] As such, intermediate vehicles that can provide more specialized services can be a significant transport mode for persons with disabilities. However, it is important to emphasize two aspects of accessibility with on-demand shared services. First, while these services may cover necessary gaps in the formal public transportation network, these services are in many cases provided by private operators. This means that it is much harder to develop and maintain accessibility standards for the infrastructure and services, particularly where there are many private operators competing in the same space. Second, cities should focus on providing public infrastructure that is accessible and inclusive of all people rather than creating add-on services for people with disabilities. In other words, it is necessary that public transportation services are accessible to the greatest number of people possible through universal design and planning for comfortable social and physical environments for people with disabilities. This enables more people with disabilities to use transit services independently rather than depending on ride-hail and door-to-door services that can be costly or less accessible. However, even with the most accessible of public transport systems, some people with disabilities will require door-to-door services. This combination of a strong, accessible public transit system and available on-demand services is an example of a twin-track approach for cities to meet the mobility needs of all persons with disabilities and people with limited mobility, thereby improving access for all people.

Select best practices from public transport above are applicable to these modes of transport.

105   Wheels for Wellbeing. (2019). A Guide to Inclusive Cycling.

4. CREATING INCLUSIVE AND ACCESSIBLE ENVIRONMENTS

Key points:

1 Governments should establish policy principles that explicitly address the barriers to disability-inclusive transport and urban planning to create accessible cities for all.

2 Cities can improve accessibility by targeting actions for each of the five criteria of the Disability Convention Policy Framework (DisCo framework), as proposed by Pineda (2020): laws, leadership, institutional capacity, attitudes, and participation.

3 Case studies provide global examples of key recommendations for overcoming common challenges.

Coordinated efforts by the government led by clear policy principles enables universal design changes as well as targeted accommodations, both of which are necessary to improve accessibility. Source: VISITFLANDERS, Flickr, (CC BY-NC-ND 2.0).

4.1 POLICY PRINCIPLES

As a first step to creating accessible cities for all, governments should adopt policy principles that explicitly address the barriers to disability-inclusive cities. These guide decisions and actions taken on behalf of a government for creating an inclusive, accessible city for all. Principles may mirror existing international policy frameworks, as identified in Section 2.3. In this report, we use the Cities for All's (C4All) Global Compact on Inclusive and Accessible Cities and specifically its key principles to set the policy framework for our analysis.[106] The six principles of the C4All Compact are:

No discrimination — A commitment to eliminate all forms of discrimination and barriers faced by persons with disabilities and people with limited mobility, such as older people, caregivers and young children, and pregnant people.

Accessibility — A commitment to eliminate all barriers in the social, digital, and built environments and enable full active participation for all people in cities.

Participation — A commitment to active, integral, and effective participation of people with disabilities and people with limited mobility in all stages of urban and transport planning.

Inclusive urban policies — A commitment to establish, promote, and uphold urban policies that ensure the equitable accessibility and participation of all people in cities.

Capacity building — a commitment to creating and carrying out capacity building initiatives that educate about and include considerations for the full diverse spectrum of people in cities — including persons with disabilities and those with limited mobility — which influence and enrich urban decision-making and governance.

Data for development — a commitment to data collection, storage, analysis, and dissemination that reflects the diversity of experience and people in a given population including data disaggregated by gender, age, disability, and many other characteristics that influence daily needs, mobility patterns, and experiences in cities.[107]

These policy principles are tagged in each of the case studies to show how the best-practice actions align with these principles. For example, for the case study on China's national policy build-out, actions on behalf of the national government center around building **inclusive urban policies** with a clear goal of improving **accessibility** for persons with disabilities and older people by eliminating **discrimination** in built, social, and technological environments.

107 Cities for All. (n.d.). Cities for All.

4.2 COMMON CHALLENGES, KEY RECOMMENDATIONS, AND CASE STUDIES

Key pillars for creating accessible environments include:

Laws — national and international rights and norms, alongside local and national policies, standards, and regulations for infrastructure and services that support disability rights in urban and transportation development.

Leadership — executive leaders and policymakers, and specifically the degree to which they prioritize disability rights in land use and transportation planning and allocate budget with this prioritization.

Institutional Capacity — the administrative, technical, and coordinating abilities of local institutions and the degree to which they are able to carry out disability-inclusive land-use and transportation planning.

Attitudes — supportive beliefs and positive behaviors of the general population toward targeted groups—in this case, persons with disabilities.

Participation — substantive engagement and representation by targeted beneficiaries and relevant stakeholders, which informs actions in urban and transportation planning for a given area.

Transit-oriented development ensures that accessible transport systems, along with a mix of daily-use goods and services, are within reasonable distance of individuals' homes and increase the ability of individuals to move more easily in urban areas with walking, cycling, and public transportation. However, land use and transport planning alone cannot guarantee accessible social and institutional environments for people with disability. All people in cities have a role to play in making cities disability-inclusive. Utilizing the five evaluation criteria (Laws, Leadership, Institutional Capacity, Attitudes, and Participation) from the DisCo framework by Pineda (2020), this section identifies key structural barriers, recommendations, and case studies for creating accessible environments through disability-inclusive land use and multimodal transportation systems.[108]

4.2.1 LAWS

Laws include national and international rights and norms alongside local and national policies, standards, and regulations for infrastructure and services that support disability rights in urban and transportation development.

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108 Pineda, V.S. (2020). Building the Inclusive City Governance, Access, and the Urban Transformation of Dubai.

Common Challenges

Challenge 1

In many countries and cities, laws, policies, standards, and incentives for accessible urban land use and transport systems for persons with disabilities do not exist or are insufficient.

Urban policies often prioritize nondisabled mobility and maximizing the mobility of personal motor vehicle users. A lack of legislation and standards for inclusive land use and transport planning is at the cost of creating safe, affordable, comfortable, and accessible environments for people accessing everything that they need in cities. Insufficient laws at the national and local levels is the first barrier to creating enabling environments for people with disabilities, who are often excluded from transport and urban policy and planning processes.

Challenge 2

In countries where national legislation does exist and is binding, a lack of technical standards or regulations for enforcement of legislation weakens effective implementation.

Addressing a lack of accessibility in land use and transportation planning requires moving beyond voluntary efforts to create mandatory minimum standards and laws.[109] In the United States, the first voluntary accessibility standard was introduced in 1961.[110] When it became clear that the standard was not being used, the first law on accessibility, the Architectural Barriers Act (covering all federal buildings), was passed in 1968, after which these original standards were generally adhered to.[111] Since then, additional legislation—including the Rehabilitation Act of 1973, the Education of All Handicapped Children Act of 1975, Uniform Federal Accessibility Standards, and most notably the Americans with Disabilities Act of 1990—has further enforced accessibility standards in the United States.[112] However, it may also be the case that a country can have very complete legislation and consolidated standards but that the laws are not followed and the standards are not enforced, as is the case in Brazil.[13 and 14]

Challenge 3

Accessibility policy and standards do not address the diverse spectrum of disabilities.

109   WHO and World Bank. (2011). World Report on Disability. Geneva: World Health Organization.
110   American Standards Association. (1961). American Standard Specifications for Making Buildings and Facilities Accessible to, and Usable by, the Physically Handicapped.
111   National Commission for Architectural Barriers. (1968). Design for All Americans. Washington: US Government Printing Office.
112   Boodlal, L. (2004). Accessible Sidewalks and Street Crossings: An Informational Guide. US Department of Transportation, Federal Highway Administration.
113   Presidency of the Republic of Brazil. (2015). Law No. 13,146 on Inclusion of People with Disabilities (Persons with Disabilities Statute).
114   ITDP Brazil. (October 2021). Personal communication.

Most accessibility standards concentrate on the needs of people with physical mobility impairments and focus on criteria to ensure space for maneuvering clearances for wheelchair and walking-aid users. It is essential to meet the needs of all people with disabilities. For example, accessibility standards rarely explicitly address the needs of people with cognitive disabilities or mental health conditions.[115]

Drivers and pedestrians need to quickly understand which signs are important and make decisions to effectively and safely complete their trips. The fewer signs they have to interpret, the more attention they can give to traffic conditions.[116] Implementing standards for simplifying wayfinding signage is useful for individuals with cognitive disabilities and reduces barriers to travel. There must be attention paid to how urban design policies can meet unique challenges for all people with disabilities.

Key Recommendations

Recommendation 1: Integrate universal accessibility in policies, legislation, regulations, and standards (including for housing, transportation, and other developments) in order to establish universal design and disability rights as a necessity rather than something of cyclical interest.

Clear policies for accessibility guide legislation, regulations, and standards, which in turn, guide implementation of services and infrastructure. For accessibility policy to be impactful, it must be binding for the level of government that is responsible for transportation and land use decisions (often this includes multiple levels). If policy does not explicitly address accessibility and it is not adopted into legal frameworks and regulatory standards, creating accessible physical and social environments will not be a priority and it will not continued through changing administrations.

As demonstrated in the case studies for China, Mexico, and Ecuador below, it is important that an accessibility policy landscape is clearly established, and social, economic, or political incentives encourage the integration of the policy goals. Legal and regulatory frameworks that develop from the policy can be drawn on to enforce these changes in the built environment. In countries or municipalities where laws themselves are not enough to guarantee inclusion, governments may need to stipulate penalties for noncompliance if standards and regulations are also insufficient for enforcement.

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115 WHO and World Bank. (2011). World Report on Disability. Geneva: World Health Organization.
116 Davis, J. (2014). Street Design for All: An Update of National Advice and Good Practice.

Barrier-free, accessible transportation in Kaohsiung City, Taiwan Province, China.
Source: ITDP.

📢 Spotlight on the People's Republic of China

Accessibility Regulations Passed in the People's Republic of China
`Inclusive urban policies` `Accessibility` `No discrimination`

The national government of China has taken significant strides over the past 30 years to create a policy environment that enables the inclusion, protection of, and planning for people with disabilities across the country. In 1990, the People's Republic of China passed the Law on the Protection of Disabled Persons, which was amended in 2008 to emphasize the need for construction of barrier-free facilities for persons with disabilities. A multitude of supportive policies have been released by the central government in the past decade, including the following key policies: [117]

- The 2012 "Regulations on Constructing Barrier-Free Environments," stipulates that new and redesigned public infrastructure (including housing) must comply with construction standards of barrier-free facilities. This includes barrier-free facilities in pedestrian bridges, tunnels, and roads; improvement of barrier-free public transport;[118] and inclusive and safety measures, such as pedestrian traffic signalization.[119]

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117 Tong, J. (2017). Policy Towards Disabled Persons in China: National and Provincial Regulations. Chinese Law and Government, 49(5–6), 265–274.
118 Library of Congress. (2012). China: New Accessibility Regulations Passed.
119 Ibid.

- The 2018 "Implementation [Plans for] Further Strengthening and Improving Travel Services for the Elderly and [Persons with Disabilities]," includes a vision by 2035 to have "a comprehensive, seamless, safe, and comfortable barrier-free travel service system…which can fully meet the travel needs of the elderly and [people with disabilities]." [120] This plan details the build out of transportation infrastructure with inclusive facilities, supportive communications and technologies, and improvement of the quality of transportation services.

- The 2020 "Guiding [Recommendations] of the Ministry of Industry and Information Technology and China Disabled Persons' Federation on Promoting Accessibility of Information" focuses on eliminating technology barriers for all people—and particularly persons with disabilities and elderly people—in education, medical care, employment, transportation, and other sectors.[121]

- The 2021 "Notice of the General Office of the Ministry of Transport on Organizing and Carrying Out the Investigation and Rectification of the Construction of the Barrier-Free Environment in the Highway Service Area," requires an investigation of barrier-free transportation facilities in Chinese cities to ensure they meet standards and are usable, organize responses to any problems detected, improve standards and specifications according to the investigation, and strengthen governmental information and capacity.[122]

This policy build-out had significant, measurable impact in China. In 2020, the Chinese Academy of Disability Data Sciences found that access to barrier-free environments improved for people with disabilities in more than 100 cities across China.[123] Strong legislation for the inclusion and protection of people with disabilities led to important increases in access to destinations and financial security for people with disabilities in China, among other benefits.[124] These policy frameworks are all a part of efforts to enable cities throughout China to reach the 2035 vision of a barrier-free transportation system for all.

120 Transportation Services Division (People's Republic of China). (2018). Ministry of Transport, Ministry of Housing and Urban-Rural Development, National Railway Administration, Civil Aviation Administration of China, National Post Bureau, China Disabled Persons' Federation, National Working Committee on Aging, Implementation Opinions on Further Strengthening and Improving Travel Services for the Elderly and Disabled.

121 China Disabled Persons' Federation, Ministry of Industry and Information Technology. (2020). Guiding Opinions of the Ministry of Industry and Information Technology and China Disabled Persons' Federation on Promoting Accessibility of Information Ministry of Industry and Information Technology.

122 Highway Bureau (People's Republic of China). (2021). Notice of the General Office of the Ministry of Transport on Organizing and Carrying Out the Investigation and Rectification of the Construction of the Barrier-Free Environment in the Highway Service Area.

123 Global Accessibility News. (2020, January 7). Barrier-Free Access Improves for China's Disabled: Report. China Philanthropy Times. (2021, January 26). "The Blue Book of Disabled Persons: China's Disabled Persons' Career Development Report (2020)" Released the Compulsory Education Phase Integrated Education Mainly in Regular Classes.

124 China Philanthropy Times. (2021, January 26). "The Blue Book of Disabled Persons: China's Disabled Persons' Career Development Report (2020)" Released the Compulsory Education Phase Integrated Education Mainly in Regular Classes.

Recommendation 2: Implement policies that support the use of transit and reduce the financial burden of mobility for persons with disabilities.

Cities should create policies that support people with disabilities' use of public spaces, sidewalks, cycle lanes, and public transport. This may include policies that let nonstandard cycles onboard public transit vehicles, and policies to subsidize nonstandard bicycle purchase (as people with disabilities already face financial disadvantage, and some alternative cycles can cost more than traditional bicycles).

In response to the cost of fares as a barrier to public transport, governments can provide low-to-no-fare options for people with disabilities. Many cities offer these options, such as reduced fares permits in Seattle and New York City, no fare in Buenos Aires and Mexico City, and reduced transit fare service in many Mexican cities, including León. In China, the Law of the People's Republic of China on the Protection of Disabled Persons stipulates that governments at or above the county level shall provide convenience and preferential treatment for persons with disabilities to take public transportation. This enables people with disabilities to carry necessary assistive devices onboard transit free of charge, and registered people with visual impairments can take public transportation, such as buses, trams, subways, and ferries, for free.

Recommendation 3: Establish technical standards and regulations for accessibility in urban and transport planning to enforce disability rights.

Technical accessibility standards and adequate data collection enable the monitoring and enforcement of disability-inclusive urban and transport design. Technical standards in particular are important in establishing baseline accessibility requirements; however, they can also contribute to the feeling that universal design is just a checklist of burdensome requirements. Standards should cover all aspects of urban and transport planning, such as buildings, streets, public transport stations and hubs, vehicles, services, and information.[125] While they detail the planning and design specifications, access audits, indicators, and benchmarks are useful monitoring and evaluation tools. Cities should incorporate the principles of the International Convention on the Rights of Persons with Disabilities and the Framework or Age-Friendly Cities of the World Health Organization (WHO's Age-Friendly Cities and Communities framework) when establishing disability-inclusive standards.

125 Babinard, J., Wang, W., Bennett, R., & Mehndiratta, S. (2012). Accessibility of Urban Transport for Persons with Disabilities and
Limited Mobility: Lessons from East Asia and the Pacific. Washington, DC: The World Bank Group.

Accessible Macrobús BRT stations with platform-level boarding, reduced horizontal gaps, and designated spaces on buses for wheelchair users in Guadalajara, Mexico. Source: ITDP

Spotlight on Mexico

Guidelines and Regulations for Accessible Environments in Mexico

Inclusive urban policies   Accessibility   No discrimination

The national government of Mexico has created important disability-inclusive design regulations that have improved national urban and transport standards. The National Housing Commission (Conavi) of Mexico implemented design and construction guidelines based on international norms, known as the standard housing construction code for housing, communal areas, pathways, and urban infrastructure and services. These guidelines provide important requirements for pedestrian access to buildings, among other intersections between urban and transportation planning. In 2018, the Ministry of Urban and Rural Development (SEDATU) created street design guidelines focused on the movement of people and goods and not personal motor vehicles, with special attention paid to the needs, experiences, and interests of women, girls, and people with disabilities. [126] This manual encourages the implementation of pedestrian, cycling, and public transportation infrastructure for persons with disabilities with updated standards that ensure that new construction features universal design.

Recommendation 4: Create minimum data requirements for local population mobility patterns so accessibility progress can be measured with comprehensive, quality data.

126   SEDATU & BID. (2018). Manual de Calles. Mexico City: SEDATU.54

As proposed for a human rights–based approach to data by the United Nations, cities should gather and make publicly available (when appropriate) quality data disaggregated by gender, age, type of disability, income, citizenship status, and other relevant characteristics for individuals within a given local context.[127] Governments must establish minimum data-quality standards and requirements to collect this necessary information. Organizations such as the Washington Group on Disability Statistics provide guidance for developing, implementing, and analyzing strong data metrics and census question sets.[128] Gathering data enables governments to systematically understand the diverse spectrum of disabilities, mobility patterns, and needs in their jurisdiction. And access to quality data that can be analyzed allows governments to better address the barriers to inclusion and accessibility faced by people with disabilities and those with limited mobility, such as older people, caregivers and young children, or pregnant people, in their city's built environment and transportation systems.

It is likewise important that this information is accessible to the public through governmental websites or related platforms.[129] Public access not only promotes transparency but enables public education and provides civil society and private sector organizations with information they can use to improve urban accessibility from a nongovernmental standpoint.

4.2.2 LEADERSHIP

Leadership includes executive leaders and policymakers, and specifically the degree to which they prioritize disability rights in land use and transportation planning and whether **budget** allocation aligns with this prioritization.

Common Challenges

Challenge 1

Leadership does not prioritize disability rights and universal accessibility in decision-making, so there is a lack of **funding or budgetary allocation** for universal design investments.

A lack of funding is often the greatest barrier to creating universally accessible cities and transportation systems. Prioritizing even a small amount of funding to jump-start accessible public spaces, walking and cycling environments, and public transportation can create real change on the ground. In countries with developed policies and laws governing accessibility, gaps in universal design of infrastructure are due to a lack of budgetary allocation to accessible design for all.

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127 UN OHCHR. (2018). A Human Rights–Based Approach to Data.
128 Washington Group on Disability Statistics. (n.d.). About the Washington Group.
129 UN. (2002). Human Rights and Disability.

Lack of prioritization and funding often means that universal design elements are not implemented or are added to only a few parts of the transportation system (e.g., a few stations in a transport network), sometimes with the intent for long-term implementation. It is also common that universal design principles are considered after a project is completed. This poses enormous financial burdens on cities, as retrofitting infrastructure projects is more costly than including accessibility from the inception of the planning process. For example, in new buildings, full compliance with all the requirements of accessibility standards is generally feasible at 1 percent of the total cost, while retrofitting may cost up to 20 percent of the original project cost.[130]

Challenge 2

Leadership is not composed of a diverse, representational group of people.

People with disabilities are underrepresented in decision-making and planning positions. As long as those responsible for decision-making and planning personnel are a homogenous, unrepresentative group of people (often individuals without disabilities), cities will continue to develop transport infrastructure that is exclusive.

Key Recommendations

Recommendation 1: Elect and appoint persons with disabilities to powerful leadership positions related to transport and land-use planning. Create educational and leadership opportunities for people with disability to lead organizations, governmental bodies, and agencies to inclusivity and accessibility.

To improve the accessibility of cities' land and transport planning, it is important that (i) persons with disabilities are among the people making decisions about how a city is formed and how it functions, and (ii) that people with disabilities are encouraged to pursue positions of leadership and participation. Actions to encourage people with disabilities in decision-making and planning roles include: identifying and addressing unconscious biases in a government staffing and workplace practices; providing diversity and inclusion trainings for staff and the public (discussed in the following sections); encouraging people with disabilities in senior leadership roles to speak about their disability experiences; partnering with civil society groups to connect with local community members; adopting inclusive workplace technologies and accessible formats for information; ensuring that job openings reach diverse audiences; and encouraging supportive systems within the government, such as mentorships or professional development.[131] [132]

130 IBD. (2021). Cities as Spaces for Opportunities for All: Building Public Spaces for People with Disabilities, Children, and Elders.
131 Kennedy, T. Jr., Jerdee, C., and Henneborn, L. (2019, June 4). 4 Ways to Improve Your Company's Disability-Inclusion Practices.
132 Inclusive Boards. (n.d.). Disability in Leadership Toolkit.

Recommendation 2: Educate leaders and policymakers on why prioritizing universal accessibility and allocating sufficient budget to implement universal design is important. Dedicate public subsidies to accessibility priorities, and ensure accessible services and pricing (e.g., low-to-no-fare, fare integration) at the inception of projects and programs.

When accessibility is prioritized at the inception of urban planning projects, universal design is integrated into the implementation process and cities avoid the need to do costly retrofitting of the built environment and of transportation systems. Accessibility must be understood as a part of the normal framework for urban and transport planning rather than something that is added to projects. For this to be true, leadership must understand the benefits of universal design and why it is necessary to include it from the beginning so that they can prioritize accessibility in policy and in budgetary allocation.

Prioritizing even a small amount of funding to jump-start accessible public spaces, walking and cycling environments, and public transportation is essential, and leadership must help find ways to fund an accessible vision. Creating accessible cities with universal design has an important monetary return on investment—when people can access education, jobs, markets, and shops, among other destinations, this significantly strengthens the economy. To do this, governments should establish required training about the necessity for accessibility, the benefits of universal design, and the diverse range of people in their communities (including people with disabilities) and their mobility patterns, needs, and barriers.

133 Access Exchange International. (2017). Bridging the Gap: Your Role in Transporting Children with Disabilities to School in Developing Countries.
134 Pedraza, L., et al. (2020). Accesibilidad e Inclusión en Transporte: Análisis en Ciudades Latinoamericanas: Mapas de Viaje: Curitiba.IBD y Despacio.

Platform level boarding with raised stations is a best practice from the Curitiba BRT system, in which over 80% of the stations are accessible. Source: Mariana Gil, EMBARQ Brasil / WRI Brasil.

Spotlight on Brazil

Case Study: Improving Accessibility Through Evaluation and Targeted Training in Curitiba

Data for development　Capacity building　Participation　Accessibility
No discrimination

In the 1970s, the city of Curitiba, Brazil, introduced the "Red Integrada de Transporte" (Integrated Transportation Network), an integrated bus rapid transit (BRT) network with TOD. Today, more than 96 percent of the Curitiba bus rapid transit fleet is accessible, and over 80 percent of the bus tube stations are accessible via elevators or ramps.[133] [134] The system provides accessibility for persons with disabilities, as well as benefits for the general population from the adoption of universal design, including express bus lines with dedicated right-of-way routes and level boarding and alighting into the city center; conventional local bus routes connecting at major terminals; interline "connector" buses ("the Speedy") traveling around the perimeter of the city; and "the Access," door-to-terminal service by accessible microbuses for people with disabilities who require them. These services are made accessible for people with disabilities through infrastructure such as mechanized bridge plates (boarding bridges) that span the horizontal gap between the station and the bus to ensure level boarding.

During 2019 and 2020, the Inter-American Development Bank (IDB) carried out a customer travel mapping evaluation of the public transport system in Curitiba to understand how accessible the social environment of the system is for persons with disabilities. While this transport system features many best practice elements of physical infrastructure, the study found that there are many barriers for people with disabilities in Curitiba's integrated transportation system. These include discriminatory attitudes by riders or personnel, nonfunctioning assistive technologies, a lack of maps and signage, and a lack of accessible surrounding environments to and between stations and stops, which pose significant challenges for riders with disabilities.[135]

In response to these challenges, the city of Curitiba took multiple steps to remove social barriers and improve the quality of service for people with disability. To combat social discrimination from transit personnel, the Department of the Rights of Persons with Disabilities for Curitiba carried out training for operators and officials of the transportation system on the rights of persons with disabilities. A total of 130 professionals received sensitivity training on rights for persons with disabilities and different types of disability, especially for individuals with autism spectrum disorder.[136] In addition, the Curitiba system is set to receive improvements that will increase accessibility, including adding informational and digital technologies to the system.[137]

The case study also shows that infrastructure alone is not enough to ensure universal access. Evaluating the social environment of physical spaces and taking action to remove social barriers for people with disabilities is equally important. In addition, this case study demonstrates that even transport systems considered best practices can and should continually evaluate their infrastructure and services to improve accessibility for all. Although there are more recent examples of accessible rapid-transit systems, the Curitiba BRT system remains a pioneer good practice globally.

Recommendation 3: Collaborate with national and international partners to foster leadership, policy, and adequate funding for universal accessibility.

The international landscape of disability rights and disability-inclusive design is uneven. National and municipal governments may look to best practices in countries and cities similar to their own to understand how that government is successfully progressing toward inclusive social, physical, and political environments for persons with disabilities. Leveraging the capacity of international and national institutions (e.g., development banks and agencies such as the Inter-American Development Bank and the French Development Agency), campaigns (e.g., the C4All campaign) and other supportive organizations can build out local capacity and knowledge to a better and faster degree than when governments do not have this support.

135 Pedraza, L., et al. (2020). Accesibilidad e Inclusión en Transporte: Análisis en Ciudades Latinoamericanas: Mapas de Viaje: Curitiba. IBD y Despacio.
136 Rodriguez Porcel, M., et al. (2020). Inclusión y Participación en el Sistema de Transporte de Curitiba. Moviliblog.
137 New Development Bank. (2020). Project Summary for Public Disclosure. Curitiba's Bus Rapid Transit Rideability Improvement Project.

National policies in Ecuador enforce accessible guidelines for all public spaces and public transportation system infrastructure. Source: Pedro Szekely, Flickr, (CC BY-SA 2.0).

Spotlight on Ecuador

Case Study: Ecuador Disability Policy Landscape

Inclusive urban policies Capacity building Accessibility
No discrimination

After the adoption of Ecuador's new Constitution in 2008, the government made concerted efforts to improve inclusion for people with disabilities. In 2019, [138] Ecuador enacted the National Disability Policy, which provides guidelines for the regulation of vehicles, as well as the design of public spaces and transportation systems in urban and rural environments. The policy states that all people have equality before the law regardless of whether they have a disability or not, that people with disabilities will have priority attention from the state to ensure their full social inclusion, and that the state will establish measures to remove accessibility barriers for communication and mobility (from urban, architecture, and transportation planning).[139] In this way, this policy set a clear legislative standard for accessibility that specifically includes urban and transportation planning.

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138 UNDESA. (2016). Good Practices of Accessible Urban Development. UN.
139 Republic of Ecuador. (2008). Constitution of the Republic of Ecuador.
140 World Enabled (2019). Hacia un Sistema de Transporte Inclusivo y Sostenible: Análisis y Recomendaciones de Diseño y Acceso Universal a la Política Nacional de Transporte Terrestre en la República de Ecuador. Ecuador, Quito. Pp. 100.

Ecuador's government has leveraged the capacity and expertise of international partners to develop their disability-inclusive policy landscape. In 2018, the Ministry of Transport and Public Works (MTOP), the Ministry of Environment, and the French Development Agency (AFD) proposed the "National Policy for Urban and Sustainable Mobility in Ecuador" (PNMU), which proposed national strategies for low-carbon mobility and included accessibility as a priority. In 2019, MTOP conducted an implementation analysis of accessibility and universal design of the ground transportation system. This included an assessment of the physical state of transportation modes, as well as of the legal framework and governmental institutional management on public administration processes. This study contributed to the ongoing development of national and local strategies for including the parameters of universal design and accessibility into Ecuadorian mobility strategies, policies, plans, programs, and projects, including the development of the PNMU.[140] In 2021, MTOP worked alongside AFD and other international actors through the EUROCLIMA+ program to develop Ecuador's "National Sustainable Urban Mobility Policy" and create a roadmap for all sectors in Ecuador to achieve the vision and goals identified in the policy.[141] [142] The case of Ecuador highlights how a country can scale policy frameworks for accessibility and utilize international actors such as multilateral development banks and international programs to develop, assess, and implement these policies.

4.2.3 INSTITUTIONAL CAPACITY

Institutional Capacity includes the administrative, technical, and coordinating abilities of local institutions and the degree to which they are able to carry out disability-inclusive land-use and transportation planning.

Common Challenges

Challenge 1

Either there are not dedicated staff or institutions for disability inclusion and accessibility for urban planning, or institutions responsible for the implementation of disability-inclusive urban planning lack sufficient capacity.

While legislation is a powerful tool to protect the rights of persons with disabilities, it may not be backed by institutions, which results in poor implementation and enforcement. While there are many frameworks, such as The New Urban Agenda, that set a vision for including accessibility and universal design as key principles in the planning, building, and management of urban areas, many cities and towns do not have the capacity to carry this out. This may include a lack of capacity (in terms of human resources, expertise with disability-inclusive design and implementation, local data, or other capacity needs) for local authorities

140 World Enabled (2019). Hacia un Sistema de Transporte Inclusivo y Sostenible: Análisis y Recomendaciones de Diseño y Acceso Universal a la Política Nacional de Transporte Terrestre en la República de Ecuador. Ecuador, Quito. Pp. 100.
141 EUROCLIMA+. (2021, August 18). Ecuador Brings Together Key Actors to Build a Long-Term Vision for Sustainable Mobility.
142 Ministerio de Transporte y Obras Públicas. (2020). Política Nacional de Movilidad Urbana Sostenible.

that are responsible for overseeing that people with disabilities, alongside other marginalized communities, are prioritized and included in these larger initiatives.[143] This includes authorities that oversee and set zoning, land-use, transportation, and building regulations. Research by the United Nations in 2005 found that only 44 percent of 144 countries surveyed had a governmental body responsible for monitoring accessibility for persons with disabilities, and the number of countries with dedicated committees or similar bodies of experts for specific areas such as transportation was even lower.[144] Governments must have the capacity to oversee implementation of disability-inclusive land-use planning and transportation, as well as to verify and sanction accessibility conditions. Specifically, the agency that has technical capacity for improving accessibility conditions must be granted this power, particularly at the local level.[145]

Challenge 2

Institutions lack understanding of and data for the mobility patterns and needs of persons with disabilities in their communities.

While studies about people with disabilities exist, many governments have a data deficit (including high-quality data and disaggregated data); a lack of continually updated data about persons with disabilities' daily lives, needs, and challenges (i.e., collection regularity); and a lack of data analysis for decision-making. Transportation is often cited as a large barrier for the mobility of people with disabilities in urban areas, but data that quantifies or indicates how to address this barrier is lacking.[146] This is particularly an issue when thinking about the diversity of people with disability across countries, age, gender, race, class, sexual orientation, and other intersections of identity that can result in specific and important challenges.

For example, it is estimated that there are at least 93 million children with disabilities worldwide, and approximately half of these children are not in school.[147] While it is understood that transportation is a significant barrier to reach critical destinations such as schools for youth with disabilities, there is no similar understanding of how to quantify these challenges or find ways to overcome them.[148] Gathering and standardizing data collection for persons with disabilities is important, as this enables national and municipal governments to meet the challenges and create better solutions for all people with disability. Many countries and municipalities do not currently have a data bank on disability, which would include statistics on available services and programs, as well as on the different groups of persons with disabilities.[149]

143   Pineda, V. et al. (2016). The Inclusion Imperative: Towards Disability-Inclusive and Accessible Urban Development.
144   WHO and World Bank. (2011). World Report on Disability. Geneva: World Health Organization.
145   World Enabled. (2019). Hacia un Sistema de Transporte Inclusivo y Sostenible: Análisis y Recomendaciones de Diseño y Acceso
146   Universal a la Política Nacional de Transporte Terrestre en la República de Ecuador. Ecuador, Quito.
147   Kett et al. (2020). Disability, Mobility and Transport in Low- and Middle-Income Countries: A Thematic Review.
148   UNICEF. (n.d.). Children with Disabilities.
149   Kett et al. (2020). Disability, Mobility and Transport in Low- and Middle-Income Countries: A Thematic Review.
      UNDESA. (1994). Standard Rules on the Equalization of Opportunities for Persons with Disabilities. Rule 13.

Challenge 3

Private sector entities have access to data, but do not share it with or give access to it to public institutions. This can result in a variety of complications for data access, ownership, and content.

Transport services are often private-sector entities, such as micromobility or rideshare operators. A few challenges can arise when the public sector does not have access to population and mobility data that private-sector entities have. These challenges may include: the public sector needing to pay for data, which can stretch precious financial resources; complications with private-public partnerships (PPPs), data ownership, and asymmetry of capacities between the private-sector data holder and the public authority; and data not covering all needs of the public sector (such as disaggregated data by type of disability).

Challenge 4

Institutions lack funding or capacity for necessary routine maintenance.

Even when fully accessible sidewalks, cycle lanes, transport systems, and other urban facilities are built, they often lose their usefulness for people with disabilities because of a lack of regular maintenance. This can especially be a problem in low- and middle-income countries, where funds may be more scarce or there is less government capacity to dedicate to maintenance. Examples of challenges that arise from poor maintenance include: (i) broken elevators, (ii) cracks and holes in sidewalks, (iii) sidewalks blocked by parked cars, construction debris, or shop extensions, and (iv) building frontages for commercial or housing uses that are dark, unclean, or vacant. Even when cities effectively promote people with disability-friendly regulations and standards, public spaces, transport systems, and housing/commercial facilities are not guaranteed to have proper maintenance and management.

Key Recommendations

Recommendation 1: Create an institutional body or dedicated accessibility officers experts to mainstream universal accessibility, collect quality data, monitor implementation, and evaluate outcomes using quality data.

Dedicated individuals/departments are needed alongside financing and monitoring frameworks to ensure that policies and legislation for universal accessibility are implemented. For example, monitoring and evaluation by the dedicated body, officers, or experts can oversee quality data collection and analysis or ensure that transport or development funding is contingent on compliance with accessibility and inclusion requirements, through monitoring and evaluation by the dedicated body, officers, or experts. Since urban transport is often the responsibility of multiple organizations, institutional coordination and accountability are key to ensuring that universal design is mainstreamed in urban transportation systems. In addition, it is important that governments establish continuous internal training on accessibility, including the particular challenges that people with disabilities can face, to build internal capacity.

Victor Calise, Commissioner of NYC MOPD, next to an accessible station entrance and elevator at the Greenpoint Ave. G subway station in Brooklyn, NYC. Source: Metropolitan Transportation Authority of the State of New York, CC BY 2.0, via Wikimedia Commons.

Spotlight on the United States of America

Case Study: Institutional Coordination for Accessibility in New York City

`Inclusive urban policies` `Capacity building` `Accessibility`

Ensuring complete, accessible trips in a large metropolitan area such as New York City requires vast coordination efforts between public space and public transportation bodies across the city. Mobility and transportation efforts in New York City mainly fall to the New York City Mayor's Office of People with Disabilities (NYC MOPD), the New York City Department of Transportation (NYCDOT), and New York State's MTA (Metropolitan Transportation Authority.) The MTA is the largest public transit authority in the United States, and the collaboration with the NYC MOPD is crucial for guaranteeing alignment toward improved accessibility and inclusion around the city. The NYC MOPD is the designated advisory body for New York City's compliance with the Americans with Disabilities Act (ADA)[150] and advises the Mayor and City Council on matters affecting the disability community. This body provides citywide resources and develops its own initiatives by collaborating with diverse stakeholders, including the private sector and civil society.

150   ADA National Network. (n.d.). What is the Americans with Disabilities Act? According to the ADA National Network, the Americans with Disabilities Act is "a civil rights law that prohibits discrimination against individuals with disabilities in all areas of public life, including jobs, schools, transportation, and all public and private places that are open to the general public. The purpose of the law is to make sure that people with disabilities have the same rights and opportunities as everyone else."

One of the central programs of NYC MOPD is to document the status of accessibility annually throughout the city for various key themes, including transportation. Each year, the report "AccessibleNYC" showcases a wide array of programs from diverse city departments and commissions, including collaborations with the NYC MOPD to improve and monitor accessibility across the city.[151] Some of the recent actions and collaborations include:

- A partnership between NYC MOPD and the International Code Council to develop **New York City's Inclusive Design Guidelines.** These are technical guidelines that instruct how the planning, design, and construction of public spaces can be done to successfully accommodate the needs and mobility patterns of all people in the city, regardless of characteristics such as age, sex, or physical and mental abilities.[152]

- **Accessibility actions alongside the NYC Taxi and Limousine Commission** (NYC TLC), which has successfully added universal design elements to taxi services, including a requirement to include braille and raised lettering in all taxis and an accessibility mode on passenger information screens.[153] As of 2020, more than 3,000 taxis are equipped with audio systems that transmit sound directly to cochlear implants or hearing aids for drivers and/or passengers with hearing impairments.[154] In addition, the NYC TLC provides a three-hour Wheelchair Accessible Vehicle (WAV) course curriculum for drivers and gives incentive payments to owners and drivers of wheelchair-accessible yellow and green taxis in efforts to increase accessible taxi fleets.[155][156] The NYC TLC requires accessible vehicles and services for vehicles for hire/ridesharing vehicle companies (such as Uber and Lyft) by requiring a minimum percentage of accessible rides per annual trips dispatched or requiring accessible trips to be fulfilled within a given time frame (i.e., 80 percent of accessible trip requests must be fulfilled within 15 minutes and 90 percent within 30 minutes).[157]

- NYC MOPD is additionally partnering with the MTA and the New York City Department of City Planning (DCP) to pass legislation to increase the budgetary capacity for accessibility and accelerate accessibility upgrades for transit stations in New York City. The proposal, "Elevate Transit: Zoning for Accessibility,"[158] is a citywide zoning plan that would allow the MTA to leverage planned private development and expand the areas in which MTA and DCP can collaborate with private developers to increase accessibility infrastructure in and around transit stations in the city.[159][160] This proposal catalyzes funding from private development to accelerate accessibility upgrades by off-setting costs for the MTA (such as for ADA-accessible elevators, which can often exceed expected budgets, are highly expensive, and are an additional challenge currently, given the financial strains from the COVID-19 pandemic).[161]

151 NYC Government. (2021). Accessible NYC: An Annual Report.
152 IDB. (2021). Cities as Spaces for Building Opportunities for All: Building Public Spaces for People with Disabilities, Children, and Elders.
153 NYC Government. (2021). Accessible NYC: An Annual Report.
154 NYC Government. (2021). Accessible NYC: An Annual Report.
155 NYC Taxi & Limousine Commission. (n.d.). Driver Education.
156 NYC Government. (2021). Accessible NYC: An Annual Report.
157 McDonough, A. (2021, August 12). Ride-Hailing Companies Getting Better on Accessibility. City & State New York.
158 This program will go through a formal land-use review process, beginning in 2021.
159 MTA. (2021, April 2). MTA and City Partners Announce "Elevate Transit: Zoning for Accessibility" to Accelerate Transit Accessibility Upgrades
160 MTA (n.d.). Working Together to Elevate Transit Accessibility.
161 MTA. (2021, April 2). MTA and City Partners Announce "Elevate Transit: Zoning for Accessibility" to Accelerate Transit Accessibility Upgrades.

The successful collaborations between MTA, NYC MOPD, NYC TLC, and other agencies have improved the visibility of people with disabilities and their agenda, and they have led to important political actions. In early 2020, the MTA committed US $5 billion to station accessibility in the 2020–2024 capital plan (as of 2021, about one third of stations are accessible). This coincided with the appointment of Quemuel Arroyo as the Authority's first all-agency Chief Accessibility Officer to oversee policy, programs, and initiatives in the accessibility space.[162] The case study of New York City highlights how successful administrative coordination between governmental bodies and agencies can lead to measurable, impactful change for accessibility on the ground.

> **Recommendation 2:** Establish technical and capacity-building training on the accessibility and treatment of people with disabilities. This should be oriented to decision-makers and planners who make decisions that directly impact the mobility of people with disabilities and those with limited mobility in cities.

To ensure consistent enforcement of universal design, specialized technical training on achieving accessibility outcomes for government officials, as well as design and supervision consultants, should be implemented.[163] Recruiting and hiring people with disabilities—as well as training decision-makers, planners, technical experts, and others who work to make urban and transport systems function—is important for establishing clear disability-inclusive frameworks within urban decision-making, design, and practice. These trainings should strengthen the technical knowledge of policymakers, urban/transport planners, and city/transport personnel so that the execution of policies, plans, and projects and the operation of public services are inclusive.

Capacity building should not be thought of as a technical, classroom-based exercise. It can be a person-centered approach through action-based learning, public involvement, and participatory practices, such as conversations with people with different disabilities or role-playing navigating streets or public transport with different impairments.[164] For example, in Jakarta, Indonesia, the ITDP Indonesia team in 2018 conducted an event called "City for All", in which citizens of Jakarta were invited to empathize with the challenges experienced by friends with disabilities when traveling. Participants were given wheelchairs, noise cancelling headphones, and sunglasses, and then asked to move around using pedestrian facilities and public transportation.[165]

162   MTA. (2021). MTA Names Quemuel Arroyo as First All-Agency Chief Accessibility Officer.
163   Ibid.
164   Sommer, Y. (2006). Games and Capacity Building. Washington, DC: World Bank Institute.
165   ITDP Indonesia. (2021). Menuju Transportasi Jakarta Ramah Disabilitas.

Mainstreaming universal accessibility in transportation systems and the built environment will require that it be a core module in urban and transportation planning, engineering, and architecture curricula. In addition, it is important that people with disabilities are attracted and supported in these educational fields as well, so that the accessible architecture, planning, and engineering innovations in cities are led by people with disability. Capacity-building initiatives should be designed to recognize and strengthen the abilities of all people, without discrimination of any kind, on issues relevant to inclusive processes in public management, promotion of equity, and protection of human rights in decision-making for urban development.

Recommendation 3: Build administrative capacity with information and communication technologies (ICTs), such as platforms or applications, for coordination, efficiency, and communication on the back end between transit operators and staff, and on the front end to improve transit service experience through improved trip planning, payment, and real-time information about services.

Digital information and communications technologies (ICTs) integrated into the infrastructure and services of urban areas empower citizens and city governments to effectively address the many challenges facing cities. City services, including transportation, often have digital components that must account for the needs of citizens with disabilities for all aspects of complete trips to make digitally-powered "Smart Cities" truly accessible. Procurement standards in municipal law that include accessible technical standards when acquiring equipment for transportation services will push broader deployment of increasingly accessible ICTs.

Recommendation 4: Ensure the maintenance and management of pedestrian, cyclist, and public transport spaces and other urban facilities with dedicated funding and personnel.

Fully accessible sidewalks, cycle lanes, transport systems, and other urban facilities need maintenance and management to sustain their usefulness for persons with disabilities and people with limited mobility. It is not sufficient (although it is necessary) to promote people with disability-friendly regulations and standards—these facilities need the necessary funding, mechanisms for reporting issues with maintenance, and dedicated staff to oversee and carry out routine and emergency maintenance in addition to fulfilling reported issues from the public.

4.2.4 ATTITUDES

Attitudes include beliefs and behaviors of the general population toward targeted groups—in this case, persons with disabilities.

Common Challenges

Challenge 1

There is a lack of awareness and education about the needs of people with disabilities, leading to pushback against accessibility measures and discrimination.

A core problem in the field of urban planning is the relative invisibility of persons with disabilities, both in society and under the existing international human rights instruments. This invisibility stems from the lack of people with disability in planning and decision-making, as well as a lack of physical visibility of people with disabilities due to inaccessible environments that prevent them from traveling to or being in key destinations. There is also not enough education about disability accessibility in general schooling and specialized higher education programs, and a shortage of any language or policies that specifically target people with disabilities (including defining who they are, what their needs are, and how these needs should be met to secure their equitable participation in societies). One example of this invisibility is that despite the fact that people with disabilities consistently identify frontline staff attitudes and behaviors as one of the most critical issues to be addressed, this aspect receives scant attention from authorities.[166] As outlined in the UN CRPD, a lack of visibility for persons with disabilities has led to a current reality in which social and economic structures do not provide people with disability with the full benefits of basic freedoms. Also, legal structures to protect private and public freedoms are applied less (including by frequency and rigor) to people with disabilities.[167] This lack of visibility can be an even greater issue when local and national governments do not have adequate capacity for public communications and awareness building.

Cities may face pushback from local stakeholders to provide essential urban services, such as transportation, with universal design. This may be because the general public is not informed, which can result in pushback for the perception of increased costs, lack of knowledge around universal access standards, and lack of awareness of the impact of limited mobility infrastructure on the lives of people with disabilities.[168] For example, local governments that do not create a compelling business case for universal design standards (such as expanding the understanding that all people in cities benefit from universal design) can face resistance from local business owners who do not want to spend additional funding for upgrading buildings, stations, or vehicles.[169] Another frequently cited example is public transit

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166 Venter, C. et al. (2002). Improving Accessibility for People with Disabilities in Urban Areas. DFID.
167 UN. (2002). Human Rights and Disability.
168 Babinard, J., Wang, W., Bennett, R., & Mehndiratta, S. (2012). Accessibility of Urban Transport for Persons with Disabilities and Limited Mobility: Lessons from East Asia and the Pacific. Washington, DC: The World Bank Group.
169 UNDESA. (2016). Good Practices of Accessible Urban Development.

drivers who exhibit hostile or unhelpful attitudes toward people with disabilities and do not deploy (or resist deploying) necessary accessibility technologies. This may be particularly an issue for informal public transport, in which drivers may be paid per passenger and are not economically incentivized to spend more time assisting persons with disabilities.

Key Recommendations

Recommendation 1: Provide continuous training for transport personnel who directly interact with and impact the mobility and treatment of persons with disabilities in cities.

Along with continuous training for decision-makers and technical planners (as mentioned in the Institutional Capacity section), it is important that workers who directly interact with people with disabilities are provided ongoing training. This should include training for understanding the diverse spectrum of disabilities, sensitization to the experience of persons with disabilities, and appropriate actions to support people with disability on and off transit vehicles. For example, training should include asking passengers if and how they would like assistance rather than assuming or offering only one possibility. In addition, there should be training in the use of accessibility equipment (in buildings and stations, onboard transport vehicles, etc.), including understanding how to use it and why it is important to do so. Attitudes of frontline personnel and fellow passengers are often one of the greatest mobility barriers for people with disabilities, and as such it is necessary to combat this barrier with education and awareness-building. The Curitiba case study from the previous section provides a best-practice example of targeted training for improving attitudes of frontline staff.

Recommendation 2: Build general public awareness through education and campaigns about the rights and equitable treatment of persons with disabilities and people with limited mobility in cities.

Fellow pedestrians, cyclists, and passengers can significantly inhibit the safety and comfort of persons with disabilities using sidewalks, cycle lanes, or transport services. It is important that cities identify and implement training courses, whether through general curriculum in public education, targeted campaigning to build awareness, or other measures. In addition, cities should provide ample signage that instructs the general public about good practices for sharing public spaces. For example, signage on public transit vehicles that demonstrates a person offering a seat for people with disabilities or people with limited mobility.

Community members and decision makers participate in an inclusive walking tour for International Day of Persons with Disabilities in Jakarta, Indonesia. Source: ITDP.

Spotlight on Indonesia

Case Study: Inclusive walking tours in Jakarta, Indonesia

`Data for development` `Participation` `Accessibility` `No discrimination`

In 2021, ITDP Indonesia worked with the Government of Indonesia's Ministry of Public Works and Housing (PUPR), National Public Accessibility Organisation (GAUN), and UN Women to improve accessibility by improving the national guidance on the pedestrian facilities. To enrich transport accessibility testing in Jakarta, as well as to honor International Day of Persons with Disabilities on December 3rd, ITDP Indonesia co-hosted an 'Inclusive Walking Tour' scheduled every Sunday in November 2021.[170] These events asked residents of Jakarta, both those with and without disabilities, to carry out specific routes walking and using public transportation.[171] These tours served as a way to collect data about how well these routes enable persons with disabilities to travel, promote education for those without disabilities to learn about the challenges people with disabilities face in daily travel, and bring together the community for greater visibility about the accessibility of public spaces and public transportation for persons with disabilities. This successful event yielded a lot of qualitative and quantitative data from surveys, testimonies, and observations, which is now available to the public in a new report from ITDP and the National Public Accessibility Organization (GAUN).[172]

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170 ITDP Indonesia. (2021). Menuju Transportasi Jakarta Ramah Disabilitas.
171 Ibid.
172 Ibid.

On December 3rd, ITDP Indonesia held a press conference to socialize the findings to the press, public, and invited public transport operators including the transport agency. The commitment of the Ministry of Transportation and Ministry of Public Work to work for an inclusive transport system was announced at the event, garnering attention and cementing their work for the public.

Recommendation 3: Use data to create compelling narratives about how people with disabilities are not included in societies and the positive benefits for communities if they are universally accessible to people with disability and those with limited mobility.

Increasing accessibility with universal design and other measures has positive benefits for communities' health, social connectivity, urban job markets, and economies, among other benefits. Yet many people do not know this. Nor do they understand this impact on their local community. Governments and advocacy organizations can garner support for inclusive urban planning by using data for impactful narratives. For example, research by the UK government found that shopping is the most difficult experience for accessibility, and in response, the government came up with a "purple pound" figure (£212 billion), which represents the total income of people with disabilities and their families in the UK.[173] This figure and similar ones are used by the government to highlight how much the economy could be positively impacted by businesses' improving their accessibility.[174]

Recommendation 4: Uncover and spotlight successful accessibility stories.

Grounding accessibility concepts in real-life examples can be an effective way to educate decision-makers, as well as the general public. In this way, governments benefit from collecting best practices in their city. Information, such as how individuals have been impacted by accessibility infrastructure and services or how other passengers and staff affect the mobility of persons with disabilities, can help illuminate why universal design and accessibility measures matter, how to improve them, and what to avoid for future actions. Importantly, highlighting these stories helps reinforce the attitudes necessary to bring about more accessibility.

173   UK Department for Work and Pensions, Office for Disability Issues, and the Rt. Hon. Mark Harper MP. (2014, August 27). High Street Could Be Boosted by £212 Billion "Purple Pound" by Attracting Disabled People and Their Families.
174   VisitBritain. (n.d.). Make Your Business Accessible.

Recommendation 5: Conduct advocacy campaigns to create visibility for persons with disabilities and encourage adoption and implementation of universal design. Transmit high-impact messages through communication strategies that make visible the benefits of accessibility and universal design.

Progress on disability-accessibility issues has generally been characterized by vigorous advocacy by disability groups themselves. Legislative frameworks[175] can be powerful tools to ensure accountability in creating barrier-free environments and give teeth to inclusive policies and technical guidelines. However, these need to be sustained with advocacy and communication campaigns to create awareness among different stakeholders and to generate political will toward implementation. Events (such as car-free days), multimedia (documentaries), and petitions (online petitions, signature campaigns) are some examples of tools that can be used to make people with different disabilities visible in streets and in public spaces.

175 Venter, C. et al. (2002). Improving Accessibility for People with Disabilities in Urban Areas. DFID.

05.Apr.2016

Foot-over bridge under construction in Vangani, India. Source: Gupta, S. & Jaiswal, A. (2016). Poverty, Migration, and Disability in India: From Challenges to Change. Global Disability Watch.

Spotlight on India

Case Study: Advocacy for an Accessible Railway Foot-Over Bridge in Vangani, India

`Participation` `Accessibility` `No discrimination`

In Maharashtra, a state in India, a campaign for the rights of people with visual impairment provides an example of community advocacy leading to change in the built environment. This campaign demanded the construction of an accessible foot over-bridge (also called pedestrian bridges, footbridges, and other terms) in Vangani, a town in the extended suburbs of Mumbai because of unsafe crossing conditions, particularly for people with visual disabilities. Local residents used participatory action research (PAR)[176] and a series of meetings and reflective exercises with persons with disabilities and their families. During these meetings, people with visual impairments in the community detailed their safety concerns about having to cross the railway tracks without a foot over-bridge on the western side of the major railway station in Vangani, where many people with visual impairments and their families lived.

176 A research approach that upon it in order empowers community members to collaborate with researchers to better understand their own problems and to act on that understanding to develop solutions and to promote social and/or political transformation (Selener, 1997).

Results from the PAR led to an advocacy campaign, which consisted of a video documentary, an online petition, media advocacy, and a signature campaign to promote the issue. The advocacy campaign persisted for more than a year, and the Ministry of Railways dedicated the equivalent of US $225,000 to construct the foot over-bridge across the railway tracks.[177] The construction of this pedestrian bridge significantly increased pedestrian safety from trains and comfort from reduced stress.

⚠️ **Disclaimer** It is important to note that although pedestrian bridges have the positive impact of separating individuals from traffic flow, they do prioritize the faster, less-interrupted travel of vehicles rather than the efficiency of pedestrian travel. Above-grade and below-grade pedestrian crossings (i.e., bridges and underpasses) can be a solution if they are universally accessible, but these crossings add travel length and time for pedestrians, which can be inconvenient, unsafe, and tiring.

In the case of the Vangani pedestrian bridge, this solution was a necessary safety measure because the construction of the railway and public spaces near the stations did not implement universal design and accessibility features from the start. Whenever possible, cities should implement universal design principles as part of the planning process to prioritize safe, inclusive, direct travel for pedestrians and cyclists over motorized vehicle convenience. In the majority of cases, this will include at-grade (i.e., street-level) crossings instead of bridges or tunnels.

4.2.5 PARTICIPATION

Participation includes substantive engagement and representation by targeted beneficiaries and relevant stakeholders, and the degree to which their input informs actions in urban and transportation planning for a given area.

Common Challenges

Challenge 1

There is little or no participation by the public in urban land-use and transportation planning, especially by groups that face particular barriers with the built environment, such as persons with disabilities.

Cities that do not prioritize public participation in the planning process for the built environment will not be able to holistically meet the needs of different groups in their population, such as persons with disabilities, women, children, people with limited mobility, low-income groups, and minority communities.

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177 Jaiswal, A., & Gupta, S. (2017). Advocacy Campaign for the Rights of People with Disabilities: A Participatory Action Research Within a Community-Based Rehabilitation Project in Vangani, Maharashtra. Disability, CBR & Inclusive Development, 27(4), 76–92.

For example, public spaces that focus on the experience of able-bodied people may not include places for rest, and transport stations may not include wayfinding signage in accessible formats (e.g., audio, visual, tactile). Planning and public policies must consider the lived experience (which can be assessed through participatory planning processes) of diverse groups of people in cities, especially using qualitative data (such as interviews, participatory workshops, audits, etc.). If diverse lived experiences are not included in the planning process, urban and transport plans for the city will not meet the diverse needs of a city's residents.

Areas and furniture for rest are particularly important for people with disabilities and individuals with limited mobility, such as elderly people. Source: ITDP.

Challenge 2

Public participation processes exist but are inaccessible to or not attended by persons with disabilities.

It is necessary to both implement permanent participatory planning processes that gather important qualitative information, as well as to ensure the diversification of the group of people who plan and think about how a city is formed. In addition to the previous challenge, there are many cities that have public participation processes but that are not inclusive or do not ensure representation by people with disabilities. As long as those responsible for decision-making and planning personnel are a homogenous, unrepresentative group of people (often individuals without disabilities), cities will continue to have exclusive transport.

Key Recommendations

Recommendation 1: Require public participation and ensure that it is an inclusive process. Promote the integral, equitable participation of a diverse and representative group of local residents in all phases of programs, policies, and projects.

Equitable, integral participation of diverse people in city planning is essential for creating cities for all. Public participation should meaningfully instruct all stages of urban and transport projects. In particular, planners and city staff should clearly detail who participated in project planning, how participants are representative of different groups in a given area, what participants said, and importantly, how the project was amended (or not) based on that participant feedback. Cities should ensure that participation is from a diverse and representative group of local residents (including diversity, range, and intersections of age, race, income, gender, disability, and other demographic factors as locally relevant). Ranges and intersections of different factors are important for ensuring, for example, that a participant group does not include only the wealthiest people with disabilities. Public engagement meetings, participatory workshops, planning and evaluation tools, and open-source data collection and evaluation are different methods for monitoring this engagement.

Recommendation 2: Create public engagement meetings and participatory workshops that are accessible to all people, including accessible formats, timing, locations, and ways to provide feedback.

It is essential that all people who would like to access public engagements (meetings, workshops, audits) are able to do so. This might require changing the format of traditional public meetings so they can be in fully accessible locations, offering meetings at differing times of day, and providing digital participation options, among other considerations. Meeting materials and feedback tools or apps need to be accessible to all people. In addition, innovative ways of providing feedback are important for enabling participation. An example of planners providing an accessible format for public engagement is the BRT planning process in Albuquerque, New Mexico, US: Architects built a 3D tactile model of the BRT station for people with visual impairments to touch and interact with so they could provide specific feedback through experience.[178]

Recommendation 3: Use planning and evaluation tools such as accessibility audits and focus groups aimed at assessing public space and transport systems so institutional, legal, physical, and digital barriers can be eliminated.

Accessibility audits are one of the most useful tools for public participation. They allow cities to evaluate accessibility requirements and universal design for new projects in the planning phase as well as to document barriers and necessary changes to the existing built environment. Auditing methods can be combined to conduct comprehensive assessments to ensure that accessibility products and services are supporting persons with disabilities to their full potential.

178   Carrigan, Aileen. (2021, October). Personal communication.

Although these audits often relate to physical accessibility, monitoring and evaluation can also include digital spheres (such as websites). [179] User consultations can likewise be specifically oriented toward social and informational accessibility evaluations.

An accessibility audit assesses the coverage and quality of accessible, universal design for a given environment (such as a street, transit station, or transit vehicle), including the physical infrastructure, communications and information systems, and services provided.[180] Audits should be conducted with diverse members of the public, including diversity of age, race, income, gender, disability, and other factors as locally relevant, as this lowers biases in data collection. An access audit can include a checklist audit, walk-through audit, and user consultation: [181]

- A checklist audit will have listed accessibility elements (often aligned with local, national, or international standards) to look for and record for a given environment, such as a street or a transit station.[182] The Street Level Checklist of the Pedestrians First online tool by ITDP assesses the comfort, safety, and walkability of cities at the street level, focusing on elements such as road safety, walkway and walkway amenities, crossings, and transit access.[183]

- The walk-through audit evaluates in greater detail the continuity of accessibility for a given environment by physically being present in and moving through the evaluated environment. In the case of transportation, this could include completing an entire trip to assess accessibility from start to end. The California Department of Public Health's Step by Step toolkit (2016) is an example in which a person conducts a more formal assessment of a given area and can inspect infrastructure, lighting, traffic patterns, and safety concerns in real time.[184] The Neighborhood Level Evaluation of the Pedestrians First online tool by ITDP is another example.[185]

- A user consultation is the process of assessing accessibility and affordability from interviews with people who use a given service or frequent a particular environment. This enables evaluators to understand personal experiences and local contexts. Passenger feedback about public transport shapes inclusivity improvements. Cities should conduct audits and consultations on a regular basis rather than just once to ensure that modifications are being made and infrastructure/services are meeting all customers' needs. The customer journey mapping evaluation in Curitiba, which collected data from passengers using the system, is an example.[186] It is worth noting that persons with disabilities' lived experiences are highly valuable, and individuals who participate in "user consultations" should be paid for their time and experience.

179 ESCAP. (2016). Accessibility for All: Good Practices of Accessibility in Asia and the Pacific to Promote Disability-Inclusive Development. Bangkok.
180 UN ESCAP. (2016). Accessibility for All: Good Practices of Accessibility in Asia and the Pacific to Promote Disability-Inclusive Development.
181 Ibid.
182 Ibid.
183 ITDP. (2020). Pedestrians First: Tools for a Walkable City.
184 Safe Routes to School National Partnership (2016). Step by Step. California Department of Public Health.
185 ITDP. (2020). Pedestrians First: Tools for a Walkable City.
186 Pedraza, L., et al. (2020). Accesibilidad e Inclusión en Transporte: Análisis en Ciudades Latinoamericanas: Mapas de Viaje: Curitiba.

People with disabilities attend a participatory planning workshop in Cairo for the city's BRT system. Including people with disabilities in planning enables much better transport systems from the outset, rather than having to retrofit existing systems. Source: ITDP.

Recommendation 4: Leverage public participation through accessible (ideally open-source) platforms and technologies to improve data collection and access for persons with disabilities.

In addition to audits, workshops, and other in-person participation, it is important that municipal and national governments collect, store, and evaluate data about the mobility and needs of diverse people in their populations (as discussed in Section 5.2.3). Cities should work with open-source data collection technologies to allow local populations to collect data about the city. These platforms, such as websites and phone applications, should be available in accessible formats (such as high contrast, large font, and audio descriptions). The following case study explores two of these open-source applications:

Recommendation 5: Leverage public participation through accessible (ideally open-source) platforms and technologies to improve data collection and access for persons with disabilities.

In addition to audits, workshops, and other in-person participation, it is important that municipal and national governments collect, store, and evaluate data about the mobility and needs of diverse people in their populations (as discussed in Section 5.2.3). Cities should work with open-source data collection technologies to allow local populations to collect data about the city. These platforms, such as websites and phone applications, should be available in accessible formats (such as high contrast, large font, and audio descriptions). The following case study explores two of these open-source applications:

Wheelmap uses the data infrastructure of accessibility.cloud, an open API data exchange service developed by Wheelmap. Source: Wheelmap.

Spotlight on Wayfinding Platforms and Applications

Case Study: Accessible Wayfinding Platforms and Applications

Data for development **Participation** **Accessibility** **No discrimination**

Along with improvements and maintenance of transport infrastructure, vehicles, and operations, accessible wayfinding technologies can help people with disabilities to avoid barriers when traveling.

Apps such as Wheelmap.org and AXS Map (pronounced "access map") are designed so people with disabilities, people with limited mobility, and interested individuals can identify and report gaps in the built environment (which enables better walking, cycling, and transport). Users can add information to a shared map interface, which means that information that may otherwise be available only through word of mouth is publicly accessible to all users. For example, AXS Map uses the Google Maps Application Programming Interface (API), so all areas available on Google Maps can be evaluated in AXS Map.[187] Similarly, AccessMap (separate from AXS Map) is an open-source project using OpenStreetMap (OSM), which maps barriers such as steepness and raised curbs and includes special edits for wheelchair, e-wheelchair, and cane users. Notably, it allows a user to customize the grade of hills for ascending or descending. As it is based in OSM, people can provide more information through the open-source platform. Other apps, such as mPASS (mobile Pervasive Accessibility Social Sensing), which also uses OSM, can identify around 200 accessibility barriers and suggest accessible urban paths tailored to individual abilities.[188]

187 Zero Project. (n.d.). The Playful Way to Create Accessibility Maps.
188 Mirri, S., et al. (2014). Extended Abstract for the RDWG Symposium on Accessible Way-Finding Using Web Technologies.

Project Sidewalk enables online crowdworkers—similar to a first-person video game—in collaboration with local civil society organizations to contribute physical-world accessibility information by walking through streets using Google Street View (GSV).[189]

It is important to note that wayfinder technology is only as useful as the amount and quality of data it provides. For example, some apps simply ask whether a location is accessible, while others look for wheelchair access alone, ignoring non mobility disabilities related to sight, hearing, cognition, chronic illness, learning, or chemical sensitivity.[190] Each of these applications tackles this lack of information in unique ways, and it is important for cities and supportive organizations, such as NGOs, to encourage the public to add data to these platforms.

In Project Sidewalk (projectsidewalk.org), users are given missions to explore city neighborhoods and find accessibility problems. The UI consists of four parts: (center) GSV-based exploration and labeling pane; (top) button menu bar; (right) mission pane with progress tracking and navigation; (left) settings menu. Project Sidewalk is open-source, and all collected data is available at http:/ projectsidewalk.org api. Source: Project Sidewalk.
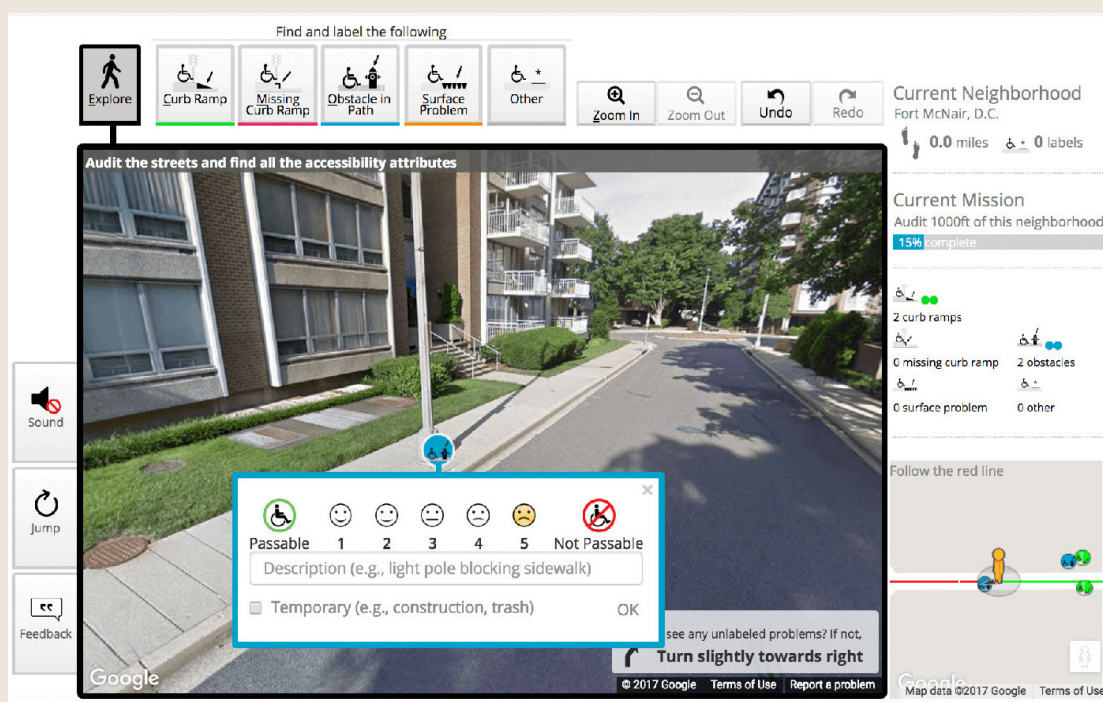
One strategy for gathering large amounts of data at a single time and encouraging the use of these apps is accessibility mapathons. In general, mapathons have been used for a variety of projects for humanitarian, environmental, and accessibility purposes by the United Nations and other international actors.[191] Accessibility mapathons in particular gather a large group of people with or without disabilities to collect data on accessibility features of the built environment to produce a broader understanding of access. Cities should consider working with civil society or schools to get large teams of people involved. Youthmappers, an organization that encourages young adults in universities to participate in mapathons, is an example.[192] Taking part in these events can help people who do not typically experience access barriers to notice and report them. Creating and storing the data into open source databases makes that information enduring.[193]

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189 Saha, et al. (2019). Project Sidewalk: A Web-Based Crowdsourcing Tool for Collecting Sidewalk Accessibility Data at Scale.
190 Hamraie, A. (2018). A Smart City Is an Accessible City. [online] The Atlantic.
191 UNDESA. (2016). Good Practices of Accessible Urban Development. UN.
192 YouthMappers. (n.d.). Accessible at: https://www.youthmappers.org
193 Ibid.

5. CONCLUSION

Persons with disabilities make up nearly 15 percent of the global population, and in low- and middle-income countries (LMICs), nearly 20 percent of the population are persons with disabilities.[194] Globally, more than half of all people with disabilities live in towns and cities. When cities provide access for all persons, including those with disabilities, they are better cities for all. Public spaces and complete streets that have wide, unobstructed, and designated spaces for walking, cycling, and public transit are better for people with disability, but they are also safer and more comfortable for all pedestrians, particularly those with limited mobility, such as older adults, or those that move more slowly, such as pregnant people, babies, young children, and their caregivers.

Inclusive transit-oriented development—by providing a mix of goods, services, people, and opportunities within short enough distances to complete daily trips by walking, cycling, and transit, and taking care to provide universal access as well as socioeconomic inclusion—is an important approach for improving accessibility of cities for people with disabilities and those with limited mobility. Alongside TOD, universally accessible walking, cycling, and public transportation facilities improve the access and inclusion of persons with disabilities in urban areas. By reducing the financial and psychological burden of car-oriented travel, as well as the distance between key daily destinations and housing, accessible TOD and urban mobility systems enable more independent mobility and increased access to goods, services, social and economic opportunities. They also offer an increased sense of security and belonging and a higher quality of life for people with disability and their families.

The following tables summarize key recommendations for accessibility in urban land-use and transport planning using the DisCo framework of laws, leadership, institutional capacity, attitudes, and participation.

Participatory evaluations of public spaces and transportation infrastructure in Jakarta improve understanding of the existing challenges for people with disabilities in the city and informing priority actions for the government. Source: ITDP.

194   Pineda, V., & Dard, B. (2016). The Inclusion Imperative: Towards Disability-Inclusive and Accessible Urban Development.

LAWS

1 Integrate universal accessibility in policies, legislation, regulations, and standards (incl ding for housing, transportation, and other developments) in order to establish universal design and disability rights as a necessity rather than something of cyclical interest.

2 Implement policies that support the use of transit and reduce the financial burden of mobility for persons with disabilities.

3 Establish technical standards and regulations for accessibility in urban and transport planning to enforce disability rights.

4 Create minimum data requirements for local population mobility patterns so accessibility progress can be measured with comprehensive, quality data.

Spotlight on Mexico: Guidelines and regulations enacted for accessible environments for persons with disabilities

Spotlight on the Republic of China: Accessibility regulations passed for barrier-free urban environments

LEADERSHIP

1. Elect and appoint persons with disabilities to powerful leadership positions related to transport and land-use planning. Create educational and leadership opportunities for people with disability to lead organizations, governmental bodies, and agencies to inclusivity and accessibility.

2. Educate leaders and policymakers on why prioritizing universal accessibility and allocating sufficient budget to implement universal design is important. Dedicate public subs dies to accessibility priorities, and ensure accessible services and pricing (e.g., low-to no-fare, fare integration) at the inception of projects and programs.

3. Collaborate with national and international partners to foster leadership, policy, and adequate funding for universal accessibility.

Spotlight on Ecuador: Creation of the Disability National Policy leveraging international support

Spotlight on Curitiba, Brazil: Improving attitudes through planned evaluations and targeted training

INSTITUTIONAL CAPACITY

1 Create an institutional body or dedicated accessibility officers/experts to mainstream universal accessibility, collect quality data, monitor implementation, and evaluate outcomes using quality data.

2 Establish technical and capacity-building training on the accessibility and treatment of people with disabilities. This should be oriented to decision-makers and planners who make decisions that directly impact the mobility of people with disabilities and those with limited mobility in cities.

3 Build administrative capacity with information and communication technologies (ICTs), such as platforms or applications, for coordination, efficiency, and communication on the back end between transit operators and staff, and on the front end to improve transit service experience through improved trip planning, payment, and real-time information about services.

4 Ensure the maintenance and management of pedestrian, cyclist, and public transport spaces and other urban facilities with dedicated funding and personnel.

Spotlight on New York City, USA: Institutional coordination for mobility programs improving accessibility for all people

ATTITUDES

1 Provide continuous training for transport personnel who directly interact with and impact the mobility and treatment of persons with disabilities in cities.

2 Build general public awareness through education and campaigns about the rights and equitable treatment of persons with disabilities and people with limited mobility in cities.

3 Use data to create compelling narratives about how people with disabilities are not included in societies and the positive benefits for communities if they are universally accessible to people with disability and those with limited mobility.

4 Uncover and spotlight successful accessibility stories.

5 Conduct advocacy campaigns to create visibility for persons with disabilities and encourage adoption and implementation of universal design. Transmit high-impact messages through communication strategies that make visible the benefits of accessibility and universal design.

Spotlight on Jakarta, Indonesia: Inclusive walking tours for data collection, education, and awareness building

Spotlight on Vangani, India: Successful citizen advocacy for creating an accessible railway bridge

PARTICIPATION

1 Require public participation and ensure that it is an inclusive process. Promote the integral, equitable participation of a diverse and representative group of local residents in all phases of programs, policies, and projects.

2 Create public engagement meetings and participatory workshops that are accessible to all people, including accessible formats, timing, locations, and ways to provide feedback.

3 Use planning and evaluation tools such as accessibility audits and focus groups aimed at assessing public space and transport systems so institutional, legal, physical, and digital barriers can be eliminated.

4 Leverage public participation through accessible (ideally open-source) platforms and technologies to improve data collection and access for persons with disabilities.

Spotlight on Wheelmap, Project Sidewalk, and AXS Map: Open-source data collection technologies for improving accessibility in cities.

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