www.cepal.org/transporte

Issue No. 298 - Number 6 / 2011

BULLETIN FAL

FACILITATION OF TRANSPORT AND TRADE IN LATIN AMERICA AND THE CARIBBEAN

Disability and mobility: interaction of two public policies for sustainable development

Introduction

A sustainable transportation policy should address the range of mobility needs of the population and promote development and social inclusion. This paper summarizes the main conclusions of a study soon to be published by the Infrastructure Services Unit analysing the mobility needs of the population and the social impacts of sustainable transportation policies.

This bulletin is divided into the following sections: the first section gives an overview of disability in Latin America and the absence of specific transportation policies that promote the design and operation of mass transit services for the integration of this sector of the population. The second section proposes a series of institutional guidelines and technical measures for virtuous interaction between the two policies to promote the integration and full development of this sector of the population.

I. Disability and transportation policies

The United Nations World Health Organization, together with the World Bank, published the World Report on Disability in 2011, which found that 15.3% of the world's population has or has had a "severe or moderate disability," while 2.9% has a "severe disability" (WHO and WB, 2011). The report adds that disability is generally most prevalent among people aged 60 years and older.

According to the report, 14.1% of the population of Latin America and the Caribbean has some degree of disability, and the disabled population

This issue of the *FAL Bulletin* analyses institutional alternatives and international best practices for the development of transportation services that explicitly include and integrate users with some type of disability. This study is among the activities being implemented by the Unit under the project "Strategies for environmental sustainability: climate change and energy," an initiative funded by the Spanish Agency for International Development Cooperation (AECID).
The author of this *bulletin* is José Ignacio Nazif, a consultant in the Infrastructure Services Unit of the Economic Commission for Latin America and the Caribbean (ECLAC).
For more information, please contact trans@cepal.org

UNITED NATIONS
ECLAC
aecid

ISU INFRASTRUCTURE SERVICES UNIT
Natural Resources and Infrastructure Division, UNECLAC

experiences higher illiteracy and unemployment rates than the general population in the region (IDB, 2006). These factors, together with the difficulties specific to getting around, result in less mobility for people with disabilities, perpetuating a vicious circle of marginalization and poverty that is hard to break without the support of a public policy in their favour.

Despite the importance of this issue and the large number of people in the region who are affected by it, there are no specific plans in place to address this problem and promote improved mobility and social integration. Furthermore, the various assessments of transportation and mobility policies in Latin America and the Caribbean are quite critical of the efficiency, flexibility, and sustainability of transportation services (Figueroa, 2005; Lupano and Sánchez, 2008; Pérez Salas and Sánchez, 2010; Hidalgo, 2011), pointing out that sustained growth in the vehicle fleet (both private and mass transit vehicles) has not been accompanied by gains in service quality. Figueroa notes that explosive growth in the vehicle fleet is related to a "drastic reduction in vehicle import duties and greater liberalization in the type and quality of vehicles," which has consequences for passengers in general and for people with disabilities in particular, inasmuch as the expansion of the vehicle market has favoured the introduction of "vehicles poorly adapted to mass transit" (Figueroa, 2005).

According to Figueroa, Steinfeld (2011) and the aforementioned IDB report on disability, at least three factors are hindering the inclusion of people with disabilities in the transportation sector: (i) high fares; (ii) informal or deficient mass transit (in terms of availability and quality of service); and (iii) limited access to private vehicles, primarily due to economic reasons and because vehicle design in general does not facilitate use by people with disabilities, aspects that are only recently being considered by vehicle manufacturers (Steinfeld, 2011).

The foregoing assessment is shared by Lupano and Sánchez (2008), who make the following additional points: first, there is very little coordination between the transportation and urban planning sectors, whose measures do not necessarily dovetail. Second, the diversity of jurisdictions, along with poor mechanisms for public-private collaboration, means that attempts to develop integrated and sustainable transportation systems are marred by significant negative externalities. In the opinions of these authors, these issues could be at least partially resolved by consolidating autonomous transportation authorities. Not only would this facilitate collaboration with the private sector, it would also introduce the concept of inclusiveness in transportation, leading to the adoption of measures targeted to the needs of the different types of user.

Table 1 summarizes the seven challenges that have been identified and their possible nexus with disability policies. This constitutes the first step in visualizing how the public actions involved can interact, keeping in mind that people with disabilities participate differently in the transportation system and that public resources are limited.

Table 1 highlights some measures that favour inclusion and comprehensive development of the population with disabilities. With better statistical data on the use of modes of transportation by people with disabilities, the intensity and order of importance of the interaction that occurs between them could be adjusted. The concept of "splintering urbanism" inserted between the fifth and sixth challenges in table 1 was developed by Graham and Marvin (2001) to describe how certain urban development processes offer a wide variety of premium networked infrastructures which have been designed and implemented for the sole purpose of integrating and interconnecting powerful users and spaces and, as a result, fail to consider —and thus continue excluding— less powerful users and spaces.

II. The integration of two public policies to promote sustainable transportation

In order to develop better transportation services and mobility that explicitly provide for the inclusion and integration of all people with disabilities, the intersectoral nature of the policies and universal design must be addressed.

Intersectoral collaboration: As noted by Audirac, with respect to policies for the integration of people with disabilities, and Correa, with respect to territory, urban transportation, and the city (Audirac, 2008; Correa, 2010), a sector-based approach is not enough, because a partial vision that is focused on only one aspect of the problem has proven to be inadequate to the complexity of the challenges associated with fully integrating people with disabilities into societies, while providing for the growth and development of transportation systems and mobility. Accordingly, a need has arisen for comprehensive, intersectoral actions to effectively address the complexity of the processes to be intervened. The creation and coordination of mechanisms that will facilitate interaction between the different sectors involved (political, technical, and social), thus guaranteeing a multidimensional theoretical and practical approach to the problem, is a first step in this direction.

Table 1
COMMON TRANSPORTATION-RELATED CHALLENGES IN THE REGION AND OBJECTIVES REGARDING THE NEXUS WITH DISABILITY POLICIES

Challenges	Objectives related to interaction with disability policies
1. Lack of coordination between mobility policies and responsibilities differentiated by mode of transport and delegated with nebulous parameters to various jurisdictional levels (national, regional, and local).	1. Create permanent institutional links between transportation and disability policy authorities in order to address the various jurisdictional levels. Also, develop integrated policies that coordinate the various actors and aspects involved.
2. Relative isolation of transportation policies from general urban planning.	2. Develop institutional models that integrate universal design criteria and promote comprehensive policies with the participation of the private sector and nongovernmental institutions.
3. Ineffective institutional models for dealing with the range of challenges facing transportation and mobility systems, which require both a high degree of autonomy and coordinated action with the private sector.	3. Contribute to improvements in the situation of vulnerable groups living in unplanned settlement areas through modernization of infrastructure and access to public transportation in accordance with universal design principles.
4. High levels of urbanization, accompanied by unchecked growth, including the unplanned settlement of lowincome groups in geographically remote areas and/or areas with mobility challenges and limited access to public transportation.	4. Contribute to improvements in mass transit by introducing elements that facilitate access, and the information they deliver in accordance with universal design principles.
5. Low-quality mass transit system —in some cases with loss of control over fares, leading to rate hikes— characterized by: • Bus operators with outdated technology and/or poorly structured services in relation to demand. • A fragmented supply of small private operators often competing ruthlessly for market share. • Rail systems with growing operating deficits and underfinanced investment programmes. • Mass transit vehicles not adapted to provide universal access due to reduction in vehicle imp	5. Consider exploring a differentiated fare schedule for access to public transportation by people with disabilities.
6. Explosive increase in the private vehicle fleet, with growing levels of congestion and pollution, and rising accident rates.	6. Modernize bus and rail stations, and look for ways to improve access to railcars in accordance with universal design principles.
7. Construction of urban highways and expansion of road grids to accommodate more vehicles.	7. Promote tax incentives for the automotive industry or transportation operators to develop vehicles or services adapted to the needs of people with disabilities.
	8. Introduce impact and universal design criteria into urban highway designs to ensure that pedestrian infrastructure is balanced with the pressure to expand the road grid.

"Splintering urbanism"

Source: Prepared by the author based on the assessments provided in Transporte urbano y globalización. Políticas y Efectos en América Latina (Figueroa, 2005); Políticas de Movilidad Urbana e Infraestructura Urbana de Transporte (Lupano and Sánchez, 2008:9, 25 and 46); and Transporte Sostenible para América Latina: Situación Actual y Perspectivas (Hidalgo, 2011).

Universal design: This is a concept that came out of design and architecture in the early 1970s, in order to address the challenges that people with disabilities face in their immediate physical environments. The method breaks with the anthropometric standards situated in the 5th to 95th percentile of the normal curve for which spaces tended to be designed (Hitchcock and others, 2001) and proposes a new paradigm for products and services, as illustrated in table 2. These principles recognize that it is the environment that disables and excludes people in various ways, so the design of spaces should integrate the diversity of users from the start, striking a balance between access, use and cost, where the intention is to provide sustainable transportation.

Table 2
PRINCIPLES AND FUNCTIONS OF UNIVERSAL DESIGN

Principle	Function
Equitable use	The design appeals to diverse groups and offers a way to participate that is interchangeable and does not stigmatize.
Flexibility in use	The design provides for multiple ways of doing things. The adaptability of the design is what makes the models universally usable.
Simple and intuitive use	Use of the design is easy to understand, regardless of the user's experience, knowledge, language, skills or current concentration level.
Perceptible information	The design provides for multiple ways of communicating messages regardless of ambient conditions or the user's sensory abilities.
Tolerance for error	The design minimizes hazards and the adverse consequences of accidental or unintended actions.
Low physical effort	The design can be used efficiently and comfortably with a minimum of fatigue.
Size and space for approach and use	The design accommodates variety in people's body sizes and ranges of motion.

Source: The Principles of Universal Design (Follete Story, 2011).

The principles and functions of universal design have already been incorporated in some transportation systems in some developed countries, including Japan, Norway, the United Kingdom and the United States. In Latin America and the Caribbean, there are just a few isolated initiatives in the design of pedestrian crossings with auditory assistance or BRTtype bus stops with wheelchair accessible lifts that can be operated without thirdparty assistance.

III. Preliminary recommendations on technical measures

There are two spheres of action, set out in table 1, that are aimed at achieving this study's proposed objective: (i) to improve the institutional framework so intersectoral coordination of these two policies can be effectively accomplished; and (ii) to implement a series of practical measures in line with universal design principles and the pedestrian, passenger, and driver roles that people with disabilities can fulfil.

Institutional framework for intersection. With the understanding that 62% of the region's countries have laws and governmental institutions in place to promote policies for the inclusion of people with disabilities (Vásquez, 2006), the institutional solution does not entail the creation of any new autonomous institutions, commissions or committees to manage the complexity of intersectoral coordination. That type of solution would only increase the complexity of an already bureaucratic State and necessitate medium-term agreements, which in some cases would require legislative approval, delaying the solution to the problem. Instead, the focus should be on institutionalizing a way of working across and between sectors, with the governmental actors that the countries already have in place, as well as representatives from civil society and the private sector.

Table 3
MATRIX OF FUNCTIONAL LIMITATIONS AND ROLE OF THE USER IN TRANSPORTATION SYSTEMS

Functional limitations [a]	Role of the user in land-based transportation systems		
	Pedestrian	Mass transit passenger [b]	Drivers or passengers in private vehicles
Processing information Visual Hearing Speech Susceptibility to fainting or dizziness Head movement Coordination Stamina Manipulation Lifting, reaching, or carrying objects Inability or difficulty to use upper extremities Inability or difficulty to use lower extremities Limitation of sensation Difficulty in balancing Difficulty in sitting	Objectives 3, 4.1, 4.2 and 4.3 (table 1)	Objectives 3, 4.1, 4.2 and 4.3 (table 1)	Objectives 5 and 6 (table 1)

Source: Prepared by the author.
[a] The functional limitations were taken from The Workplace Workbook 2.0 (Mueller, 1992).
[b] A passenger is understood to also include any person who enters a bus, metro, or train station.

The matrix shows those areas of intervention at the intersection of the two policies, distinguishing by transportation user and by disabled group, indicating in the cells where both "variables" intersect the objectives associated with the challenges presented in table 1. With this information, the next step is to form a work team, which should be composed of representatives from the sectors involved (including the budget sector), and decide on a general work objective that places greater emphasis on the disabled population (in the broadest sense) as a beneficiary group than on any one sector in particular (transportation or public space). The integrated policy model for mobility proposed by the ECLAC Infrastructure Services Unit will facilitate this task.

In addition, during both the design and evaluation stages, it is important to encourage the participation of people with disabilities, as well as representatives of civil society, academia and the private sector, so the policy not only acquires legitimacy but also is technically rigorous.

The measures that will be discussed in this section are general in nature and not intended to be exhaustive. The ad hoc work groups should design products and services —public or private— taking into consideration the different existing mobility needs and based on the specific characteristics of their services, city and culture.

Pedestrians

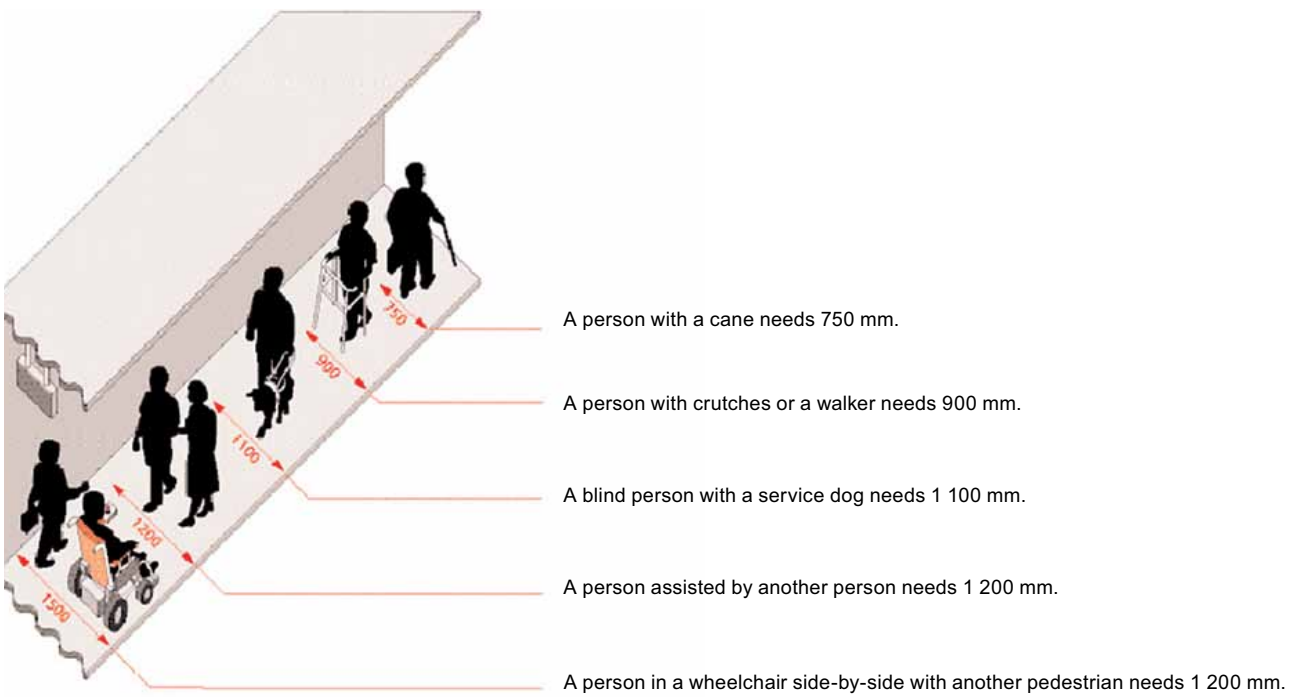
Sidewalks: To design sidewalks in accordance with universal design principles, objective (quantitative) and subjective (qualitative) elements should be considered to address the needs of disabled persons. With respect to the former, at a minimum the following features should be considered: barriers on curves, steps as barriers, ramps or inclines, surface texture, width (as shown in figure 1), separation from motorized and unmotorized traffic and freedom from hazards at eye level, street furniture and excessive trash (Manley, 2011).

With respect to qualitative elements, the following are important: lighting and orientation (it is important to consider whether there are adjacent roads, whether there is a clear sidewalk structure, and/or whether there is adequate signage). For these considerations, accessibility audits are recommended to identify which elements impede the smooth flow of all types of pedestrian traffic and to make the corresponding corrections (Manley, 2011).

A consideration that applies to the management of all public spaces (and in this case, to pedestrian walkways, sidewalks, pedestrian bridges, stations, passenger loading and unloading zones) is keeping them clean and free of any obstructions that could impede the movement of people.

The United Kingdom's Department for Transport proposes a series of measures to implement on sidewalk surfaces in order to promote greater mobility both for disabled persons and for the general population. These include installing a tactile strip when sidewalks are being built or modified, standardizing pedestrian crossing points, warning of surface hazards, and warning of the start or end of a curb or the beginning of a roadway, among other actions that envisage the use of standard colours and dimensions, elements that could be adopted by the region's countries and incorporated into their respective manuals or regulations on urban design and construction.

Figure 1
DESIGN CONSIDERATIONS FOR THE IMPLEMENTATION OF SIDEWALKS AND PLATFORMS THAT FAVOUR URBAN MOBILITY AND THE MOBILITY OF PEOPLE WITH DISABILITIES



Source: Adapted from Inclusive Mobility (Department for Transport, United Kingdom, undated).

Pedestrian walkways: These are planned routes that have been designed to consider and integrate different types of user and their respective mobility needs. In accordance with Ciudad Accesible, these urban solutions enable people to navigate smoothly between public transportation and buildings, guaranteeing the independent mobility of pedestrians (Ciudad Accesible, 2004). Considerations include assessing and redesigning as necessary uneven surfaces, pedestrian crossings, the width and slope of the walkways, location and access to urban furniture, elements on the pedestrian area, visual and informational signage, visual and auditory signals, public parking spaces[1] and access, navigation and interaction with facilities and equipment in parks and plazas.

Pedestrian bridges: These structures provide an elevated walkway for pedestrians and cyclists at crossings with heavy vehicular traffic. The major challenge associated with these bridges is to ensure that ramp gradients do not endanger people with disabilities or prevent them from using the structures. The recommended gradient is between 8% and 10%, and railings at different heights should be installed to help people navigate. Another point to consider is "that pedestrian bridges should begin and end at a sidewalk that is directly connected, without obstructions, to the bus stop or walkway. This is essential so as not to break the chain of accessibility" (Ciudad Accesible, 2004).

Mass transit passengers

Design of stations: It is important for all services and destinations to be as visible as possible. When planning and designing mass transit stations, it is important to minimize distances inside the stations, integrating transit systems throughout the stations and minimizing checkpoints, changes in level, and ticket counters. In those cases in which a large station is necessary, it is recommended that moving walkways should be used for long distances and that wheelchairs should be provided at all passenger loading zones for people with reduced

possible. Signs designating places inside the station should be positioned high up and directly related with the place that the user is seeking, and public announcements should be made on loudspeaker systems. The use of multiple languages in notices and announcements, including indigenous languages as applicable, along with the installation of information kiosks with special support for people with disabilities will promote the integration of the different transportation users.

Among the technologies used for people with visual impairments are tactile maps and strips that facilitate pedestrian navigation throughout stations. In Steinfeld's opinion, talking signs represent a promising technology to help the visually impaired orient themselves inside a station. These devices require a handheld receiver and a clear and uninterrupted signal between the receiver and the transmitter. Wifi is another new technology that allows the user to access information from the Internet in real time using visual and audio media (Steinfeld E, 2011).

Design of passenger loading and unloading zones: The main concern is to eliminate the grade change between the floor of the vehicle and the passenger loading and unloading zone. In many cases, especially for people who use wheelchairs or crutches or people loading or unloading strollers, the ideal situation is no change in grade level. Otherwise, mechanical systems should be installed to ease the transition between from one zone to another, in addition to barriers or signs warning of safety hazards in these areas (Steinfeld E, 2011).

In addition to physical design considerations, it is also important to provide current arrival and departure information in these zones. This can be accomplished with stationary information maps, but technology devices can also be used to deliver this information, such as portable telephones (Burkhardt, 2003). In addition, it is important to notify passengers of the arrival of vehicles through visual and audio media