Introduction

In recent years helpful guides have appeared in both Spanish and English to assist planners and officials to construct accessible buildings and pedestrian infrastructure which are usable by seniors, persons with disabilities, and all others who especially benefit from universal design. Less has been written about access to public transport systems, especially in Spanish. Very little guidance is available concerning specific issues which confront those planning Bus Rapid Transit (BRT) systems – mass transit systems which incorporate a spectrum of design and operational features on integrated trunk and feeder routes and which were initiated in Latin America and are now spreading throughout the region and beyond.

In Colombia, BRT systems are in different stages of planning, implementation, and expansion. Bogota’s well-known TransMilenio is expanding, while construction is under way for Pereira’s Megabus and Cali’s El MIO. Meanwhile, planning is rapidly moving forward for the construction of the Metroplús system in Medellín, Metrolínea in Bucaramanga, Transmetro in Barranquilla, and Transcaribe in Cartagena. Colombia will thus be the first country in the world to provide integrated systems of mass transport in most of its major cities.

External funding for these systems is provided by the World Bank, with the important exception of Cali, where funding is provided by the Interamerican Development Bank. Conscious of their role in promoting “transport for all” around the world, institutions such as the World Bank are working with the national Ministry of Transport and municipal stakeholders to promote the accessible design and operation of BRT systems in Colombia and beyond. The Bank has learned much from the pioneering accessibility features of TransMilenio and from Medellín’s Metro and Metrocable systems.

This experience, combined with what has been learned from other countries, has resulted in this first draft of BRT Accessibility Guidelines. The draft is provided for comment by stakeholders in Colombia and beyond. The guidelines focus on the BRT environment and assume that interested parties can take advantage of existing guidelines to clarify general issues of access to public space, buildings, and pedestrian infrastructure. Titles of references are given in their first use, then abbreviated. Full information on each reference is found in the Resources section at the rear of this report.
Guidelines generally follow the travel path of a passenger via sidewalks and pedestrian crossings into a typical mid-island station served by buses with left-side doors pulling up to the high platform. The guidelines then focus on station features, crossing the gap into the bus, and bus features. Due to the integrated nature of BRT, the guidelines focus equally on both trunk line and feeder line issues, while acknowledging that a long-term planning process may be needed to identify funding for improved feeder line infrastructure and vehicles. *The guidelines are especially detailed when addressing BRT features which have proven to be problematic according to findings by planners and passengers in Latin America.* *Special yellow “alert” notices are placed to further emphasize these sections.* The final version of this guide will include resources on the costs and benefits of different access features. However, the majority of the features discussed in this guide are low cost or even without cost in new systems.

Appendices will be added to provide an overview of persons with disabilities and other beneficiaries of universal design in Latin America and also an overview of the promotion of accessible transport in the region. These and many other materials have already been broadly distributed to practitioners in Colombia and will be made available on the final project CD.

These draft guidelines are being made available in both Spanish and English versions. The guidelines will then be modified for use in other countries in the region and beyond. Photos no credited are by the author.

<table>
<thead>
<tr>
<th>Contents of this draft</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.0 PUBLIC PARTICIPATION</td>
<td>3</td>
</tr>
<tr>
<td>2.0-6.0 ACCESS TO FIXED FACILITIES</td>
<td></td>
</tr>
<tr>
<td>2.0 Access to public space</td>
<td>4</td>
</tr>
<tr>
<td>3.0 Fare collection</td>
<td>9</td>
</tr>
<tr>
<td>4.0 Trunk line stations</td>
<td>9</td>
</tr>
<tr>
<td>5.0 The platform-to-bus gap</td>
<td>14</td>
</tr>
<tr>
<td>6.0 Access to feeder line stops</td>
<td>18</td>
</tr>
<tr>
<td>7.0-10.0 BUS ACCESS</td>
<td></td>
</tr>
<tr>
<td>7.0 Bus specification process</td>
<td>20</td>
</tr>
<tr>
<td>8.0 Signage and announcements</td>
<td>20</td>
</tr>
<tr>
<td>9.0 Bus entrances and interior design</td>
<td>22</td>
</tr>
<tr>
<td>10.0 Feeder line deployment and wheelchair access</td>
<td>30</td>
</tr>
<tr>
<td>11.0-12.0 PUBLIC INFORMATION AND TRAINING</td>
<td></td>
</tr>
<tr>
<td>11.0 Public information</td>
<td>32</td>
</tr>
<tr>
<td>12.0 Training</td>
<td>33</td>
</tr>
<tr>
<td>RESOURCES for accessible transport planners</td>
<td>35</td>
</tr>
</tbody>
</table>
# BRT Accessibility Guidelines

## 1.0 PUBLIC PARTICIPATION

BRT planners should use focus groups of users and an advisory committee to review and assess plans for access to BRT systems during the entire planning and implementation process. (For more information, see AEI, *Making Access Happen*, pp. 3-15, on public participation, listed under “Resources” at rear.)

### 1.1 Focus groups

Focus groups composed of 6-12 persons with different types of physical, sensory, and cognitive impairments, including frail seniors, can identify their travel barriers and help prioritize access features.

For information, go to TRL, *Enhancing the mobility of disabled people: Guidelines for practitioners*, pp. 32-33 at [www.globalride-sf.org](http://www.globalride-sf.org)

### 1.2 Advisory Committee

Transit planners should include individuals with different types of physical and sensory impairments on an advisory committee which meets periodically to (1) put inclusive transport on their agenda, (2) help officials to remain focused on access through periodic meetings, (3) prioritize actions, (4) avoid costly mistakes, and (5) monitor results by testing access features (or mockups of access features) and reporting back on compliance with design and operating standards. End users of accessible transport should also participate in any Accessible Transport Working Group bringing together government ministries and other stakeholders.

**Alert** (1) Make sure the committee is representative of different disabilities. For example, passengers with hidden disabilities, such as arthritis, need to be heard. Lack of such representation may be one cause of a lack of proper emphasis on the design of bus entrances. (2) Also assure that disabled persons from neighborhoods served by feeder routes are on the advisory committee, as well as persons from areas along trunk line corridors.

For information, consult TRL or AEI, *Making Access Happen*. 
2.0 PEDESTRIAN USE OF PUBLIC SPACE TO BRT STATIONS AND TO FEEDER LINE BUS STOPS

For further detail, see IDB, Guía Operativa de Accesibilidad para Proyectos de Desarrollo Urbano; TRL, Enhancing the mobility of disabled people: Guidelines for practitioners, pages 75-91; or AEI, Movilidad para Todos, pages 4-6.

Diagram of accessibility features for Avenue Simón Bolívar, from presentation by city of Pereira, Colombia

The features include

1. Use of the universal symbol of accessibility
2. Traffic lights with acoustic signals to assist those with sensory impairments
3. Access ramps for passengers with mobility impairments
4. Well marked pedestrian crossings
5. Curb ramps with color and texture differentiation
6. Accessible pedestrian walkways
7. Wide fare gate for persons with disabilities

2.1 SIDEWALKS AND PATHS

The minimum width for accessible pedestrian pathways is specified as 1200 to 1500 mm in many countries, with 900 mm the minimum for passing through a portal such as a doorway. The minimum clearance over a pathway, especially to protect blind pedestrians, is specified as 2000 to 2200 mm in many countries.

2.1.1 Surface

- Persons with mobility and sight impediments especially benefit from even and smooth pedestrian pathways with non-skid surfaces. Sidewalks should be
| condition | Leveled and well paved, with a maximum side-slope ideally of 1 to 2% and not more than 2.5% if possible. Obstacles such as street furniture should be off to the side to permit a straight and clear pathway for all pedestrians.

- Pedestrian paths should ideally be kept clear of gratings which can catch the small front wheels of wheelchairs. If this is not possible, grate openings should be perpendicular to the pedestrian path and with small openings.

- Solutions are required so that vendors who have occupied public space are removed, typically by designating alternative locations. Enforcement by security personnel is needed. |

| Photo: Street vendors crowd public space near pedestrian overpass on planned BRT corridor in Bucaramanga, Colombia |

| 2.1.2 Tactile guideways | Tactile guideways benefit blind persons and help others to find their way, especially (1) across large unmarked areas, (2) along complex paths to a known destination such as an information booth, or (3) on pedestrian ways without curbs or the sides of buildings to serve as a reference. Guideways should be used in a consistent manner and are most helpful when they are in a contrasting color and texture to their surroundings. The need for tactile guideways varies from country to country. For example, tactile guideways are little used in Europe or the USA, but are often found in major cities in China and Japan. Much depends on the availability of mobility instruction for blind persons, which may eliminate the need for tactile guideways in some situations. In most countries, tactile guideways are marked by raised parallel bars pointing in the direction of travel.

- In BRT environments, tactile guideways can be especially useful to mark a travel path from a sidewalk across a pedestrian crossing to a BRT station, then turning up the ramp into the station and proceeding to the ticket vending and information booth. Care should be taken that tactile guideways do not lead into obstacles or safety hazards.

- The need for tactile guideways should be reviewed in focus groups and by advisory committees of users in cases where national norms do not already exist. (See IDB, pages 27-30; TRL; and also DfT for guidance from the United Kingdom) |

| 2.1.3 Tactile warnings | Most countries agree on the need for detectable tactile warning strips to mark hazardous areas such as platform edges or transitions from curb ramps to street pavements. (See photo at 4.6.2) Tactile warnings benefit everyone, especially blind persons or those with low vision. They are marked by a truncated dome pattern in many countries which helps differentiate them from tactile guideways. Go to www.access-board.gov/research&training/DWSynthesis/report.htm at ADAAG for detailed information from several countries. |
2.2 INTERSECTIONS AND OTHER CROSSINGS

The diagram above (from TRL, p.86, copied with permission) presents good practice at street crossings as depicted in this publication sponsored by the United Kingdom’s Dept. for International Development.

2.2.1 Curb ramps

Correctly designed curb ramps benefit most persons and especially those using wheelchairs, walkers, or strollers. **ALERT** The trip chain for wheelchair riders and many others with mobility impairments can be broken by a single excessively steep curb ramp. Steep curb ramps can lead to injuries.

Curb ramp features:

Planners and designers are advised to consult norms addressing curb ramp construction. In Colombia, guidance includes NTC norm 4143; Decree Number 1538 (May 2005), Article 7; Alcaldía de Medellín *Manual de Diseño* (2003), pp. 38 & 232; and Law 361 (1997), Chapter Eleven.

One widely followed standard is found in the regulations of the Americans with Disabilities Act at [www.access-board.gov](http://www.access-board.gov) or see IDB, pp. 24-27 (vados peatonales: rampas de acceso en las aceras).
Curb ramps should not exceed a maximum gradient of 8%, that is, a 1:12 slope with one unit of vertical rise for every 12 units of horizontal distance. (Curb ramps built on sloped terrain will be shorter or longer depending on the degree to which the terrain helps or hinders obtaining a 1:12 grade.) Where possible, a gradient of 1:20 is preferred and a 1:20 gradient should be the maximum slope of adjoining gutters and road surfaces. The transitions between the curb ramp surface and adjoining surfaces should be free of abrupt changes so that the foot braces on wheelchairs do not scrape against these surfaces.

Curb ramps should have a protective warning strip, aligned with the curb ramp on the opposite side of the intersection. Curb ramps should not direct pedestrians out of the pedestrian crossing into traffic in the middle of the intersection.

Curb ramps should lie within the marked pedestrian crossing. Whenever possible, it is best practice that curb ramps should be the same width as the pedestrian crossing, as illustrated in the photo at right from Rio de Janeiro, and in no case should a curb ramp be less than 1200 mm wide. (See TRL, IDB) Full width curb ramps are seldom more costly, could eliminate potential trip hazards, and are architecturally pleasing. However, consult with focus groups and advisory committees (see Section 1.0, above) to determine if this approach is satisfactory to blind persons who in some cases may prefer narrower curb ramps.

Some cities require deep gutters to carry off heavy rainfall (e.g., San José, Costa Rica), creating an added challenge by requiring that “curb ramps” be designed to bridge the deep gutters. Street furniture and utilities can also create design problems.

### 2.2.2 Other ramps

Recommended gradients vary with ramp lengths. The following is adapted from a UK guideline (see TRL).

<table>
<thead>
<tr>
<th>Gradient of ramp</th>
<th>Recommended use</th>
<th>Maximum horizontal length</th>
</tr>
</thead>
<tbody>
<tr>
<td>10% (1 in 10)</td>
<td>Very short distances only</td>
<td>1 meter</td>
</tr>
<tr>
<td>8% (1 in 12)</td>
<td>Most curb ramps</td>
<td>2 meters</td>
</tr>
<tr>
<td>5% (1 in 20)</td>
<td>Ideal gradient</td>
<td>10 meters</td>
</tr>
</tbody>
</table>

Also see 4.2.2: Ramps to BRT stations

### 2.2.3 Raised crossings

- Across lightly used side roads, for example, on some feeder lines, raised crossings can assist all pedestrians and especially help those who are frail or otherwise require more time to cross the street.

---

### 2.3 SIGNALIZATION
### 2.3.1 Traffic signals

- Intelligent traffic signals are an integral part of BRT systems, decreasing the travel time on trunk line buses. Traffic signals need to be set to allow frail seniors and other slow-moving pedestrians sufficient “green time” to cross. The width of pedestrian crossings can be adjusted to the flow of pedestrians, with wider widths able to handle more pedestrians.

### 2.3.2 Audible signals

- Audible signals at pedestrian intersections can especially assist passengers who are sight-impaired. Audible sounds can be annoying to nearby residents, and some locations can be user-activated by uniformly located push buttons.

### 2.4 PEDESTRIAN BRIDGES

#### 2.4.1 Pedestrian bridges or pedestrian underpasses are expensive, requiring long ramps or elevators if they are not to obstruct many passengers with mobility impairments. They should be avoided when possible due to their expense and also the pedestrian travel time and fatigue required to use them. However, pedestrian bridges are sometimes indispensable and special care should be taken to provide resting places for wheelchair users who will otherwise become fatigued. See TransMilenio presentation on pedestrian bridges (Puente Peatonal).

### 2.5 PRIORITIZING PEDESTRIAN ROUTES

Authorities have prioritized making public space accessible to all along the major trunk line corridors in Colombia’s cities. Such access is necessary in order to make public transport available to seniors, persons with disabilities, and many other categories of persons who especially benefit from universal design. However, feeder routes connecting to trunk line corridors are often surrounded by inaccessible infrastructure which may prevent up to half of those with disabilities from ever reaching the trunk lines. The photos at left, from Cartagena (top) and along a feeder route to TransMilenio (bottom) illustrate this concern. **Alert** Even when funds are currently lacking to upgrade access along feeder routes, the design of a BRT system should require a comprehensive long-term planning process to prioritize the systematic construction of accessible paths to feeder route bus stops. (See AEI, *Making Access Happen*, pp. 16-25)