

Universal Access to Bus Rapid Transit: Design, operation, and working with the community



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INTRODUCTION

The ability of Bus Rapid Transit systems to serve persons with disabilities in less-wealthy countries seemed obvious at first glance. The earliest graphics of BRT trunk lines in Curitiba, Brazil, depicted wheelchair users crossing boarding bridges into articulated buses. Problem solved! Thus, years later, many may be surprised to find cities where wheelchair users are unable to access one or another BRT system. Other beneficiaries of universal design – including older persons, women, children, and those with hearing or sight impairments – are often not heard from. They just quietly decide they cannot use Bus Rapid Transit to get where they need to go.

What happened? Why have the apparent advantages of BRT systems become problematic in many cases? It turns out the devil is in the details.

But first, the positive news. Bus Rapid Transit trunk lines are indeed a historic step forward, especially in cities in developing countries where they may represent the first large-scale application of inclusive design to any public transit system. Accessible sidewalks, curb ramps, grade-level crossings, tactile guideways and tactile warning strips all make their appearance, along with visual and audio signage and, above all, floor-level boarding – features which are there to be witnessed and copied elsewhere for decades to come. Along with these advancements come safer and better lit stations, easier fare payment, and other features that meet the needs of seniors, women, children, tourists, blind persons, those with low vision, and people who are deaf, deafened, or hard-of-hearing. From this perspective, a well designed BRT system can appear to be an island of accessibility in the midst of a sea of inaccessibility. And therein lies part of the problem: the different elements of universal access are often considered in isolation from each other when, in fact, they all form the social, operational, and built environment required for an accessible trip chain from trip origin to the BRT trunk line, into the bus, and on to the trip destination.

To illustrate how the details of design, operation, and outreach interact, we are presenting three composite case studies* of the experience of typical passengers in Latin American, Asian, and African cities.

MARIA: She might get to the bus someday, but certainly not now

María is 65 years old and lives in a low-income neighborhood far removed from the central business district. She is “slowing down a bit” but still wants to lead an active

life. She heard about the new BRT trunk line that is about to open and she knows that if she could use it that would open up new vistas for her. She could visit old friends and perhaps find part-time work in the commercial district downtown. The sidewalks in front of her house are reasonably flat and smooth, but she fears she might trip as she tries to reach the BRT feeder line a few hundred meters away. The problem is a particularly bad section a block away where the sidewalk is missing in front of some buildings and in other sections is filled with vendors. María has to walk out in the street, sometimes dodging cars and trucks, not to mention the mud which is splashed up when traffic hits the rutted roadway. And she is concerned about her safety because there are no street lights. She lives in a high crime area and she fears getting robbed. All in all, she decides to only use the system when she can get a friend to accompany her. In fact, she feels a bit upset about all the excitement about the new BRT system. If they can plan the trunk line with all its new sidewalks on either side, why couldn't they also improve her street as well?

María lives in the “sea of inaccessibility” and she cannot reach the “island of accessibility.” She may or may not realize that the BRT planners are not responsible for improving the sidewalks and street crossings far from the trunk line. She certainly realizes she is faced with a broken link in her trip chain. She can get out of her house, walk one block, and then is faced with a series of barriers which make it impossible for her to reach the feeder bus line that leads to the trunk line.

Here are two lessons we learn from María.

1. Many potential passengers will not use Bus Rapid Transit for reasons that have nothing to do with the system. Neighborhoods need to be secure and safe and people need to feel they can walk outside even when it is dark. People need to organize themselves to create more livable neighborhoods and these issues are not divorced from the need to build usage of a BRT system.
2. While BRT planners know they are not responsible for reforming the pedestrian infrastructure of an entire city, the matter may be seen in a different light by citizens who want BRT planners and operators to join with business groups and city departments – including transport, public works, and traffic police – to promote and plan the long-term incremental improvements in pedestrian infrastructure without which a BRT system will forever float in “the sea of inaccessibility.” BRT policy makers need to extend their reformist vision to the larger municipal context even while they focus on the tasks at hand. Yes, BRT will hopefully decrease congestion, reduce pollution, and eliminate the “war of the peso” where drivers compete with each other for passengers. But this reformist vision needs to extend to the infrastructure of less-wealthy areas such as María's. Her story is “on hold.” Inspired by the accessible pedestrian infrastructure along the BRT trunk lines, people like María also need to become advocates with different city departments so that they will improve inaccessible sidewalks and street crossings until, increasingly, more and more people can enjoy the benefits that come with an accessible Bus Rapid Transit system.



Transport and public works departments need to coordinate platform height with bus floor height, as done by Lane County Transit in Eugene, Oregon. (Photo courtesy of Richard Weiner of Nelson\Nygaard)

JOHN: Constrained choices but hopefully a convert to public transit

John uses a wheelchair to increase his mobility, offsetting his inability to walk due to a childhood accident. While John is not wealthy, he can afford a good manual wheelchair and has enough upper body strength to move along at a fairly rapid pace on level ground. Better yet, John is only two blocks from a BRT trunk line running down the middle of one of the most heavily travelled streets in the city. A shorter commute time to work is in the offing. With high hopes, John ventures out to ride the BRT system on opening day. The sidewalk in front of his house is flat and smooth, and curb ramps at the corners speed him on his way across the intersection between his house and the trunk line. As he approaches the trunk line, he realizes that the pedestrian bridge that connects with the center-island station does not have an elevator. This could end his trip, but the BRT planners have instead built a long ramp, complete with flat rest areas, to assist him in wheeling up the ramp, across the pedestrian bridge, and down another ramp into the center-island BRT station. Going up the ramp is hard and John notices that a mother carrying her baby is also finding it rough going. He wonders if he will need to ask someone to help push him. He makes it to the top, remembering the story of a friend in his disability NGO who was not so fortunate – his friend found only a pedestrian bridge with steps at his stop and was told he should cross at a “special crossing” at grade level, just for disabled persons. This crossing turned out to be dangerous and required that he attract the attention of a staff person within the station. But John did not face this problem. He arrived at the station somewhat tired but ready to travel. Approvingly, he noted a low window for use by shorter persons, children, wheelchair users, and others to purchase a debit card to use the system. Large-print signage helped direct John and

everyone else to the correct part of the station, and a bright yellow tactile warning strip marked out the door where his bus would arrive. A uniformed station assistant was on hand to direct passengers on their way. The excited passengers (after all, this was the opening day!) were waiting with high expectation. John had never tried this before. This would be the first time in his life that he would be able to board a bus. Then the brand-new articulated bus pulled up and John surveyed a 20 cm. gap between the edge of the platform and the beckoning floor of the bus. He pushed forward, only to find the small diameter front wheels of his wheelchair falling into the gap and finding himself at an awkward angle. A station attendant and an obliging passenger lifted the front of his chair out of the gap and John, somewhat the worse for wear, was inside. It was an embarrassing moment, and it wasn't helped that the wheelchair securement position – conveniently located opposite the door – was occupied by standing passengers who made no attempt to move, leaving him in the aisle. As it happened, a TV station covering opening day on the BRT system spotted John and interviewed him as he got off at his destination. It was a bitter experience for the BRT planners to watch the interview after all the good faith efforts they had made to make the system fully accessible.

Thinking about it later, John had a variety of reactions. He had noticed some very careful attempts to make his trip accessible. Good faith efforts had *indeed* been made. However -

1. The BRT planners had been wary of consulting with agencies like the NGO John helped head up. They feared “stirring up” too many constituencies. There were already more than enough groups voicing concerns, ranging from an association of informal transport operators, to a neighborhood that wanted the BRT line everywhere else but in *their* back yard, to a merchant group that protested the loss of parking spaces where a station was being planned. The upshot was that no one ever did make contact with the disability NGOs. Frankly, they did not know what to expect and were afraid of them! There was a lot of talk about “accessibility” on the radio, but John and his group had felt rather alienated by the process. Where was their voice? What had happened to the slogan of disability groups around the world, “Nothing about us, without us!” They had not been asked for input before or during the construction process, nor was there any advisory committee in place to deal with ongoing issues like the need for a smaller platform-to-bus gap – a feature that would have speeded boarding for everyone while improving safety for small children and most elderly persons. What if John’s NGO had been involved at an earlier stage? They surely would have suggested that more attention be placed on the very design features that had given John a problem on opening day.
2. Did the BRT planners prioritize the pedestrian bridges without giving careful consideration to the merits of grade-level crossings that would have made it far easier, and faster, for all passengers to access the system? Perhaps the pedestrian bridge, or a pedestrian tunnel with a shorter ramp, was indeed needed. But did they really know? While efforts were made to make the pedestrian bridge accessible, a set of elevators would have totally solved the problem without fatiguing John and, for that matter, a lot of other passengers including many

seniors, pregnant women, people with heavy packages, and persons with hidden disabilities such as arthritis or heart disease. Were the planners only counting potential passengers using wheelchairs, or were they looking at all the categories of passengers who benefit from universal design?

3. The driver had not pulled up close enough to the station edge, and for all John knew the station was constructed to always keep the bus at least 20 cm. from the edge. This was “level boarding” over what looked like a chasm to John. Actually, the driver was poorly trained, and the BRT planners had not really considered how to narrow or eliminate the gap. Even a 40 cm. gap would have been fine with them. It just wasn’t that high on their agenda. After all, no *other* bus system in the city gave much thought to that kind of thing! They had never considered bridging the gap for *all* passengers with boarding bridges located at each door.
4. No one had ever taken the trouble to allow John to test his boarding skills before his first trip in a crowded station at peak hour. Would it have been simpler to back onto the bus, with the large rear wheels of his chair crossing the station-to-bus gap first and then dragging the smaller front wheels more easily over the gap? John would later find his boarding skills much improved. As with almost every human activity, repetition makes all the difference.
5. No one had made any effort to educate the passengers that they needed to vacate the securement area that John needed when he got on board. Other announcements helped passengers find their way. But there were no public service announcements on radio or television, and no text or audio announcements in the stations or on the bus, concerning the needs of persons with disabilities. Nor had the web site of the BRT operator addressed issues that are faced by passengers with disabilities.



Disability activists in Libre Acceso, an NGO in Mexico City, are shown with BRT staff inspecting access features of a Metrobús BRT station. (Photo courtesy of Access Exchange International)

ABEL and ANNETTE: A good experience for them, and for the city

Abel and Annette are tourists from another country, visiting a large city famous for its architectural and cultural heritage. As with many tourists, they are older, retired from their work. The two of them have a number of minor health problems that have not yet come between them and their desire to travel. Abel has a heart condition that makes it a bit difficult to move around rapidly. Annette has low vision but can read enlarged text on her computer.

Abel and Annette have heard about the excellent transportation system in the city they are visiting. They decide not to take taxis, but rather to save some money and ride on the modern-looking buses of the new system. A map in the hotel shows that a feeder bus line runs right by their hotel and connects with a BRT trunk line that goes to their destination. The bus stop is crowded and they are a little nervous that the next bus may be running late. However, the bus stop has a button which Abel pushes to operate a system that tells them the next bus will be along in only three minutes. They wait in the bus shelter, shielded from the mid-day sun. When the low-floor feeder bus pulls up, they notice that a “CD-style” boarding bridge slides out from under the center door, and they enjoy this level boarding feature, not having to look down to “mind the gap.” The bus is rather crowded inside and they have to stand, but they are pleased that plentiful vertical stanchions permit them to hold on. Stops are announced automatically, and a map in the bus helps them keep track of how far they have to go to reach the Bus Rapid Transit trunk line. As tourists, this whole new experience is a stretch. But all in all they remain confident as they arrive at the transfer point to the BRT trunk line that will take them to the museum that is their destination. Their bus pulls up, and they proceed across the platform to a large articulated trunk line bus.

The BRT trunk line is a new experience for Abel and Annette. The station has an attractive art exhibit, and volunteers in the station help answer their questions. They notice that one of the station attendants has a cognitive disability, but nevertheless can readily point the way to the correct door for their bus line. Then they remember that a person using a wheelchair attended the fare vending booth in their hotel and realize that persons with disabilities are very much part of the larger BRT system. Every door of each bus has a boarding bridge which descends to completely cover the gap between the station platform and the bus door. Even though Annette does not have enough vision to read even the large print signs indicating the next stop, the voice messages keep her posted. And, while the bus is crowded, she is able to sit down when a passenger kindly offers her his seat. Abel notices a sign in the bus encouraging this practice. The ride is smooth, and above all it is fast as the bus has its own right-of-way and the lights are synchronized so that they pass right by the automobile traffic slowly proceeding in neighboring lanes.

Exiting their station started off well. They noticed a large icon of the museum at their destination, reassuring Abel that this was indeed their stop. But the traffic light at the pedestrian crossing had barely enough green time for them to cross to the sidewalk

due to there being too many people trying to access the rather narrow striped zebra crossing. But they did notice that the full width of the crossing was ramped so that they could readily access the street surface.

As Abel and Annette talked about their trip, they agreed that it had been “a bit of a stretch” but they also felt proud that they had navigated a system that was completely new to them and arrived in good shape at the museum. While their trip was not without moments of mild anxiety, they realized that every effort had been made to assist tourists, first-time visitors, and car owners who now preferred BRT to the costs of gas and parking. They would recommend the tourist sites of this city to their friends when they returned home, not least because of the modern state-of-the-art bus system.

1. Abel and Annette are as much beneficiaries of universal design as someone using a wheelchair. While Annette is legally blind, she benefits from the audible signage at the feeder bus stop, at the trunk line BRT station, and on board the bus. Meanwhile, visual maps and text signs especially help Abel in his navigation of the system.
2. Both Abel and Annette benefit from level boarding. There is no need to “mind the gap.” The carefully designed boarding bridges helped brand the system as going beyond being just another bus line. The bridges speeded boarding for *all* passengers. Indeed, the level boarding came to feel like a symbol for this progressive city that cared for its visitors as well as its residents.
3. Plentiful vertical stanchions assist Abel on the trunk line, a special help for someone with a heart condition. And community outreach encouraged passengers to yield their seats to older persons and persons with disabilities.
4. Persons with disabilities are found working within the system. Art academies have loaned student art for posting in the stations and volunteers are on hand to interpret the exhibit.



Persons with disabilities and other staff and passengers pose in front of public art in a MetroCali BRT station in Colombia. Inclusive design that welcomes all passengers can include various forms of public outreach. (Photo courtesy of Access Exchange International)

SUMMING UP

1. Accessibility involves *an entire trip chain*, and each link in the chain needs to be accessible. Actually, this is true for all passengers, but it is true to a heightened degree for older persons, persons with disabilities, and others who especially benefit from universal design. A broken trip chain was the reason María was not able to use the new BRT system.
2. Accessibility is *a process*. As with so much else pertaining to any public transit system, accessibility is the result of good design, initial and refresher training of personnel, ongoing maintenance of equipment, and outreach to customers and the wider community.
3. Inclusive design requires *coordination between different stakeholders*, and especially between municipal agencies. For example, the feeder bus provided level boarding for Abel and Annette because the height of the bus floor was coordinated with the height of the bus stop. Staff of the municipal transit and public works ministries had clearly worked together. And traffic police were cooperating to keep the bus stops clear of illegally parked cars and trucks.
4. The end state of an inclusive transit system is *a lack of drama* as passengers go about their business without giving much thought to the commuting experience. Currently, many older persons, persons with disabilities, and others in developing countries cannot use public transit because of barriers in design, poor training and motivation of personnel, and lack of maintenance of access features. This creates a human rights issue, addressed, for example, by the United Nations Convention on the Rights of Persons with Disabilities, currently ratified by more than one hundred nations representing the majority of the world's population. Human rights can be a highly charged issue. So, many years ago, was the right of women to vote. That too was a highly charged issue. But in most countries no one gives this much thought now. Everyone just votes. And the end state of inclusive design is that everyone will just ride.

The author remembers an experience with a group of international guests touring San Francisco's accessible transit systems. One of the group leaders used a wheelchair. Our group took ten bus trips in all. All ten times, the bus driver stationed the bus at a bus stop free of illegally parked vehicles and correctly deployed a wheelchair lift while passengers in the wheelchair securement area automatically moved to other seats. Everyone knew what to do. Nobody even thought about what was happening. That is the goal.

5. *It is never too late* to learn from one's own mistakes and from the experience of others. It is true that María cannot ride the bus now, but she may be able to with even minor improvements to the sidewalks, street crossings, and lighting in her neighborhood. It is not clear if John will be a confirmed rider of the BRT system, but it seems likely that as course corrections are made he and many other

persons with disabilities will become enthusiastic riders, the more so as future trunk lines are designed with improved access features. Abel and Annette are already sold on the merits of accessible Bus Rapid Transit.



Cape Town uses boarding bridges for all passengers, with special curbs to enable drivers to confidently approach the platform edge. Everyone benefits from level boarding. (Photo courtesy of City of Cape Town – HHO Africa and ARG Design)

* The case studies presented in this article represent experiences reported to Access Exchange International by Bus Rapid Transit passengers in recent years. They are brought together in composite form “to put a human face” on these experiences and lessons drawn from them.

About the author: Tom Rickert is the founder and Executive Director of Access Exchange International (AEI), a non-profit agency with twenty years of experience in promoting accessible public transit for persons with disabilities and seniors in less-wealthy countries around the world. Prior to founding AEI, he was Manager of Accessible Services for San Francisco’s bus and light rail systems as well as coordinator of San Francisco’s door-to-door van and taxi services for disabled passengers. He has provided workshops and presentations in twenty-five countries. He has compiled several guides published by AEI as well as three guides for use by the World Bank -- *Bus Rapid Transit Accessibility Guidelines*, *Transit Access Training Toolkit* and *Technical and operational challenges to inclusive Bus Rapid Transit: A guide for practitioners* -- all available at <http://go.worldbank.org/MQUMJCL1W1>. Rickert is a member of the Committee on Accessible Transportation and Mobility of the USA’s Transportation Research Board and is Co-chair of its International Subcommittee. He is a member of the International Steering Committee for the International Conference on Mobility and Transport for Elderly and Disabled Persons, to be held September 17-21, 2012, in New Delhi.

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October 2011