THE BRT STANDARD

2024 Edition

ITDP

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COVER PHOTO: Passengers exiting a BRT bus into a covered and protected station with level boarding in Dar es Salaam, Tanzania.
PHOTO CREDIT: Noble Studios

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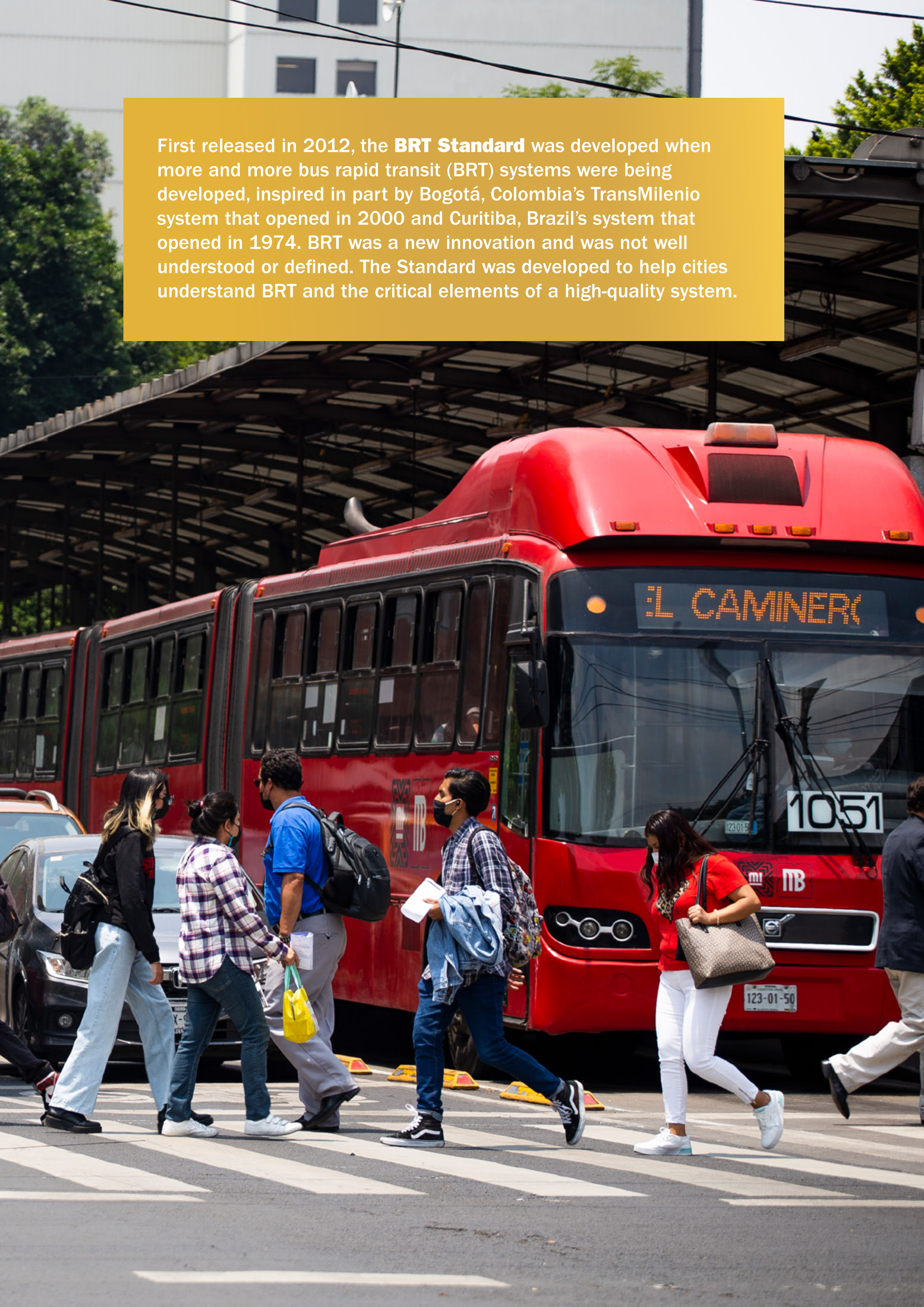
INTRODUCTION

First released in 2012, the **BRT Standard** was developed when more and more bus rapid transit (BRT) systems were being developed, inspired in part by Bogotá, Colombia's TransMilenio system that opened in 2000 and Curitiba, Brazil's system that opened in 1974. BRT was a new innovation and was not well understood or defined. The Standard was developed to help cities understand BRT and the critical elements of a high-quality system.



In the ten years since launching the guide, over 153 corridors have opened in 91 cities in 24 countries, and BRT is now a far more familiar concept. Our collective understanding of what constitutes BRT has also evolved. This is the fifth edition of the *BRT Standard*, reflecting the changing nature of the world, a better understanding of key elements of good-quality BRT and public transport, and a more nuanced view of how different people use public transport. This edition positions the *BRT Standard* to address new and evolving challenges in a rapidly changing world, helping cities create resilient rapid transit systems for the future while also meeting today's urban challenges. These challenges include climate change, post-pandemic public health, and inequity in access. The 2024 *BRT Standard* also has a new focus on accessibility for all, including people with disabilities, women, caregivers, and people of different ages.

Women comprise 26% of TransPeshawar's users, whereas women were only 2% of users of the city's public transport before TransPeshawar opened. **CREDIT:** Asian Development Bank (ADB)

BRT is particularly well-suited to help address these challenges. It provides mass rapid transit service in a shorter time frame for less cost than options like rail and delivers high-quality, rapid, and reliable public transport for all. While BRT is an important tool, it may not be the best solution in all instances. Where BRT is applied, corridors need to be well-designed and operated to achieve the many benefits of BRT. The BRT Standard provides a map of how to do that.

Below, please find more information about the *BRT Standard*, including what's new for the 2023 edition, governance of the *BRT Standard*, overview of the scoring system, and the detailed scorecard. In addition, the end of this document contains information on how to apply the *BRT Standard* to rail systems. The global need for equitable, safe, accessible, and sustainable public transport has never been greater, and this tool will help deliver on that need.

PREVIOUS PAGE: Pedestrians crossing the street at the BRT station while cyclists, motorists, and bus wait at the light in Mexico City, Mexico. **CREDIT:** ITDP


SECURITY

OVERVIEW OF THE BRT STANDARD

Bus rapid transit (BRT) is a high-capacity bus-based rapid transit system that delivers fast, high quality, reliable, safe, and cost-effective services at relatively low cost. It achieves that through dedicated bus lanes that are median aligned, off-board fare collection, level boarding, bus priority at intersections, and fast and frequent operations.


S4
出口
Exit
S3
S2

Younger people feel comfortable and safe using the BRT in Guangzhou, China. Real time information and ample space in the stations makes the experience less stressful.
CREDIT: ITDP

The *BRT Standard* is both a framework for understanding BRT and an evaluation tool for BRT corridors based on international best practices. It is the centerpiece of a global effort by leaders in bus rapid transit design to establish a common definition of BRT and ensure that BRT corridors consistently deliver world-class passenger experiences, significant economic benefits, and positive environmental impacts. BRT experts have evaluated the elements that receive points in the *BRT Standard* in a wide variety of contexts. When present, these elements result in consistently improved system performance and have a positive impact on ridership.

The *Standard* functions as:

- **A common definition of BRT:** *The BRT Standard* includes a carefully reviewed definition of the key features of BRT that result in high-performing systems. It recognizes that design and infrastructure are just the first steps in delivering high-quality public transport. Well-run and resourced operations are critical once a corridor is open.

- **A planning tool:** The Standard provides technical guidance for designers, planners, municipalities, advocates, and banks to consider and guide decision-making.

- **An evaluation tool:** *The BRT Standard* can be used to evaluate an operational corridor to show where there are gaps in design that can be rectified or problems in operations that need to be addressed.

- **A recognition system:** Certifying a BRT corridor as basic BRT, bronze, silver, or gold places it within the hierarchy of international best practices. Cities with certified BRT corridors act as models for other cities by demonstrating a cutting-edge form of rapid transit that makes communities more livable, competitive, and sustainable. Gold or silver certification does not necessarily imply that a corridor is costly. Even relatively simple systems can achieve a high score if care is given to design decisions. From Peshawar, Pakistan, to Rio de Janeiro, Brazil, cities with Gold-Standard BRT have seen significant benefits to commuters, increased revitalization of city centers, and better air quality.

PREVIOUS PAGE: Pedestrians use a safe at-grade crossing to access a BRT station in the center of a road in Jakarta, Indonesia.
CREDIT: ITDP


C91
nsMilenio

In Bogotá, Colombia, a caregiver traveling with a baby and a toddler adjusts her stroller as she prepares to enter a TransMilenio bus from a level platform. **CREDIT:** Carlos Felipe Pardo

In addition, the *BRT Standard* can be a useful tool to evaluate other modes of rapid transport, specifically rail, as the Standard enumerates the most critical components of any rapid public transport system. More information on how to apply this to rail systems can be found at the end of the Standard.

Defining the essential elements of BRT, the *Standard* provides a framework for system designers, decision-makers, and the sustainable-transport community to understand and implement high-quality BRT corridors. The *BRT Standard* celebrates cities leading the way in BRT excellence and offers best practice-based guidance to those planning a system. With this tool, more people will gain inclusive access to their city while reducing the time spent on travel, and more cities will reap the benefits of an efficient and cost-effective rapid transport system.

Tactile paving is important to help navigate the visually impared as shown in the Itaigara BRT Station in Salvador, Brazil . **CREDIT:** Jefferson Peixoto

WHAT'S NEW IN 2024

The *BRT Standard*, 2024 edition, is the product of feedback from BRT practitioners around the world. Suggestions were formulated into concrete proposals and evaluated by the *BRT Standard* Technical Committee, a group of leading BRT engineers, designers, and planners (see Governance section below). Fundamentally, the Standard has been refreshed by adding, combining, and revising elements based on expert feedback and increasing deductions for operations. The most significant changes include:

- **Recalibration of the Basics**
  The *BRT Standard* now allocates seven points for each of the BRT Basics to highlight the fundamental importance of each of the five elements.

- **Improved Scoring for Diverse Systems**
  Special attention was spent acknowledging different capacity systems and the need to provide more scoring gradients for several elements, specifically Multiple Routes, Passing Lanes, and Bus Bunching/Reliability.

- **Expanded Focus on Gender, Safety, and Access**
  A number of elements have been amended or added to better address issues around access and safety. Public transport is a public space and must ensure that all parts of the public can safely and easily access the system. A higher level of importance of access for persons with disabilities, women, and caregivers is now reflected in the Standard through amendments to elements like Customer-friendly Stations and Passenger Communication. The Personal Security and Gender-based Violence metric is a new element that stresses the importance systems can play in minimizing conflicts or harassment. These changes have also been added to existing elements like Universal Accessibility and Off-board Fare Collection, which set the expectation that systems should create equitable access and provide safe service for all passengers.

- **A New Focus on Business Operations**
  The business model that undergirds the system and provides the conditions for service delivery is fundamental to BRT. Therefore, a Business Model element has been added to encourage high-quality system operations and long-term sustainability. It emphasizes the best practices in structuring BRT operations, including gross-cost

contracting, performance-based awards and penalties, independent fare collection, and data sharing provisions BRT operations should implement.

- **Attention to Greening Measures and Resiliency**
  New elements were added to highlight how BRT systems can improve community emergency preparedness, address climate change, increase air quality, and improve human well-being and health. Many of these goals can be achieved by including natural elements that reduce the heat-island effect, improve stormwater management, increase shade and cooling, and build redundancy in the system.

- **Improved Passenger and Customer Experience**
  A number of the elements have been modified to address the passenger experience. For example, new elements like Customer-friendly Stations highlight the need for amenities like sufficient space and seating. Other elements like Passenger Information and Communication focus on providing better information to customers and enabling them to provide feedback on the service.

- **Increase in Deductions for Overcrowding, Long Signals, and Bus Bunching**
  Negative points were significantly increased from a total of 63 possible negative point deductions to 77 to recognize the impact operations has on service quality. If the system is not well maintained or operated, it will deter people from using it. Over the past decade, we have seen chronic issues with overcrowding, long traffic signals, and bus bunching. Too often, overcrowded conditions are assumed as part of the financial model for public transport systems. However, crowding is one the biggest deterrents for women, older people, people with disability, and caregivers in using public transport systems comfortably and safely. Bus bunching illustrates poor operational control and leads to unreliable and often overcrowded passenger service. Finally, long traffic signals increase travel times for walking, cycling, and public transport by prioritizing private vehicle movement. These three elements, among others, have been amended to reinforce the importance of effective BRT operations.

GLOSSARY

The following terms are important to understanding BRT:

Active Bus Control
A bus operations system that uses data from automatic vehicle location systems, which are based on global positioning system (GPS) information, to allow for bus service adjustments to be made in real-time, often through an automated process.

Arterial Street
A major transportation thoroughfare designed for longer-distance trips within a city.

Busway Alignment
The location of dedicated public transport lanes within the right-of-way on the street.

BRT Corridor
A section of road or contiguous roads served by a bus route or multiple bus routes, with a minimum length of 3 kilometers (1.9 miles), with dedicated bus lanes and that otherwise meets the BRT basic minimum requirements (see BRT Basics, page XX).

Direct Service
A BRT service pattern where the route operates both inside the BRT infrastructure and in mixed traffic. This allows passengers to make trips with fewer transfers than with conventional trunk and feeder services.

Frequency
The number of buses that arrive in a given time on a single bus route or a street segment that can include multiple routes. The deductions for low frequencies (also known as large headways) are measured by bus route. For example, on the TransOeste corridor in Rio de Janeiro, Brazil, the frequency for buses on the Expressas (express) routes is around 30 buses per hour.

Grade-Separated
When a transportation corridor is designed so that users do not cross direct paths of users on the corridors that it crosses. Grade separation is when transportation modes are separated vertically to minimize conflict with other modes. A flyover, an elevated track, and an underground metro are examples of grade separation.

Headway
The length of time between buses, either on a single bus route or a street segment that can include multiple routes. Headway is the inverse calculation of frequency (number of buses per hour). For example, on the TransOeste corridor in Rio de Janeiro, Brazil, the average headway for the Expressas (express) buses is two minutes, meaning that buses arrive every two minutes, while the frequency is 30 buses per hour.

Right-of-Way
The width of public space dedicated to the movement of people and goods and other public uses.

Spur
A stretch of BRT infrastructure that branches off a BRT corridor but is not long enough to be considered a corridor by itself, as it is less than 3 kilometers (1.9 miles).

Trunk and Feeder Service
A BRT service pattern where all BRT bus routes operate only on the BRT corridor (the trunk route), and feeder bus routes take people to and from BRT stations. Passengers must transfer between feeder routes and BRT trunk routes.

GOVERNANCE

Two committees govern the *BRT Standard*: the Technical Committee and the Institutional Endorsers. The Institute for Transportation and Development Policy (ITDP) convenes both committees.

The Technical Committee of the *BRT Standard* is composed of globally renowned BRT experts. This committee serves as a consistent source of sound technical advice and is the basis for establishing the credibility of the *BRT Standard*. The Technical Committee also certifies corridors and recommends revisions to the *BRT Standard*.

The *BRT Standard* Technical Committee members include:

- Aileen Carrigan, BESPOKE TRANSIT SOLUTIONS
- Angelica Castro
- Carlos Felipe Pardo
- Darío Hidalgo
- Gerhard Menckhoff, WORLD BANK (RETIRED)*
- Leonardo Canon Rubiano, WORLD BANK
- Lloyd Wright, ASIAN DEVELOPMENT BANK*
- Maria Fernanda Ramirez Bernal, DESPACIO
- Paulo Custodio, CONSULTANT
- Pedro Szasz, CONSULTANT
- Ricardo Giesen, BRT CENTRE OF EXCELLENCE
- Wagner Colombini Martins, LOGIT CONSULTORIA
- Walter Hook, BRT PLANNING INTERNATIONAL
- Xiaomei Duan, FAR EAST MOBILITY

Unless indicated by an asterisk (*), each committee member also represents their institution.

Furthermore, we would like to thank Manfred Breithaupt, from the Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ), who retired from the committee in 2021. He has been an integral force in advocating for BRT around the world with an eye toward high-quality impact and integrity. He is a leader in this field, and we were privileged to have him be part of the committee since its inception.

We would also recognize the service and memory of Scott Rutherford, who served on the *BRT Standard* Technical Committee. He was a dedicated professor at the University of Washington and public transport advocate for over 35 years. He is remembered for championing public transport programs within the university, Washington State, and internationally, inspiring multiple generations of learners. Scott offered balanced and equitable technical expertise and remains an admired and dearly missed colleague.

The emissions scoring detail for buses was recommended by the International Council on Clean Transportation (ICCT), a nonprofit organization specializing in vehicle efficiency and fuel standards.

The Institutional Endorsers are an integrated group of highly respected institutions in the fields of city building, public transport systems, and climate change with decision-making abilities over the BRT Standard certification process. All are committed to high-quality public transport and its impact on social and economic development.

The endorsers establish the strategic direction of the *BRT Standard*, ensure that BRT projects ranked by the scoring system uphold the goals of the *BRT Standard*, and promote the *BRT Standard* as a quality check for BRT projects globally.

The Institutional Endorsers include:

- Barr Foundation
- ClimateWorks Foundation
- Despacio
- Gesellschaft für Internationale Zusammenarbeit (GIZ)
- ICLEI - Local Governments for Sustainability
- Institute for Transportation and Development Policy (ITDP) (CONVENER)
- International Council on Clean Transportation (ICCT)
- Transformative Urban Mobility Initiative (TUMI)
- United Nations Environment Programme (UNEP)
- United Nations Human Settlements Programme (UN-HABITAT)
- World Resources Institute (WRI) Ross Center for Sustainable Cities

UPDATING THE BRT STANDARD

The *BRT Standard* is reviewed and updated by the Technical Committee. The *BRT Standard* Technical Committee welcomes input from other experts in the field, which they will take into consideration and raise for serious discussion if warranted. The Technical Committee debates proposed changes and tests them against known systems to gauge their accuracy.

The Technical Committee wants to hear feedback about the Standard, which we will review as part of the next update. Please send any feedback or questions to brtstandard@itdp.org.

SUMMARY OF THE BRT STANDARD SCORECARD

The *BRT Standard* Scorecard is divided into two main sections: **Design (for a total of +100 points)** and **Operational Deductions (for a total of -77 points)**. Both are equally important to achieve our climate and equity goals and allow users of the scorecard to use it in different ways. The Design section defines the critical features of BRT, providing a roadmap for BRT design considerations and a way for evaluating the BRT corridor in the planning stage. The Operational Deductions section is a critical component to understanding the quality of the BRT corridor and integral for recognizing if it is a Gold, Silver, or Bronze BRT.

The design score represents the maximum potential for performance on a corridor, before considering operations. Points are awarded for the elements of corridor design that most significantly improve BRT speed, capacity, reliability, and quality of service. While a corridor can only be officially certified six months after opening using the full score (see below), using the scorecard to evaluate the design during planning can indicate where the corridor design is strong and where it may need improvement, while there is still a chance to change it. The scorecard gives helpful markers for design consideration and provides a road map toward certification.

The Design section is divided into **five key pillars for a successful BRT**:

- **The BRT Basics:** the five fundamentals of BRT that put the rapid in BRT, making it more operationally efficient, reducing travel time, and improving access for passengers. These are foundational for a BRT system; thus, this section has minimum point requirements to qualify.

- **Service Planning:** BRT corridor design starts by defining the specific services that should operate inside any planned new BRT infrastructure, and that infrastructure should then be tailored to that service plan; it is an iterative process, but good public transport starts with service.

- **Stations and Buses:** BRT capacity and performance is determined primarily by BRT stations. BRT stations are also the most visible and visceral part of the system–the main way passengers experience the BRT system.

- **Communications:** If passengers do not know how to use the system, then no manner of good design will save it. Communicating with passengers about the system is vital for a BRT corridor to be effective.

- **Access and Integration:** A BRT corridor cannot be considered a standalone project. It exists within the many other systems of the city, and it must connect to them to increase access for all and ensure people can reach the BRT and then their destinations.

The second section, Operational Deductions, looks at the system's performance through a series of metrics that evaluate operations. How a BRT corridor operates will affect ridership, confidence, and trust in the system and is critical to ensuring the BRT corridor retains and attracts ridership.

Each section has multiple metrics to measure, and the *Standard* gives background on why the metric is important and how to measure them. The scorecard uses the following criteria to determine the point system:

- The points should act as proxies for better service (speed, capacity, reliability, and comfort);
- The points should be assigned based on a consensus among BRT experts on what constitutes best practices in BRT corridor planning, design, and operations and the relative importance of those factors;

- The points should reward good, often politically challenging design and operational decisions made by the project team that will result in superior performance rather than rewarding characteristics that may be innate to a corridor, such as geographic location or weather;
- The metrics and weightings should be easily and equitably applicable as well as scalable to a wide range of BRT corridors in different contexts—from lower-ridership, smaller corridors to larger, high-volume corridors;
- The basis for the score should be reasonably transparent and independently verifiable without recourse to information that cannot be readily obtained.

Since the Van Ness BRT in San Francisco, USA, opened, ridership has increased by 60% and travel times have decreased by 13 - 35%. **CREDIT:** BeyondDC via Flickr

The *BRT Standard* relies on easily observable design and operations characteristics associated with high performance rather than on performance measurements. This is the most reliable and equitable mechanism for recognizing quality in different corridors. The main reasons for this approach include:

- **Good data is rare and expensive:** while there are excellent quantitative metrics for measuring the effects of a BRT corridor (e.g., passenger door-to-door travel time, passenger experience rating, etc.), this data is extremely difficult, expensive, and time-consuming to collect and nearly impossible to corroborate independently;
- **The Standard enables assessment of both planned and existing corridors:** the *BRT Standard* is intended to help guide planning and design decisions before corridor implementation. The Design Score can be assessed for planned and built corridors and allows the two to be compared, whereas the performance standards described above are only applicable when assessing operational corridors. Since many of the planning and design decisions are literally set in stone, this is invaluable in guiding BRT planning.

The *BRT Standard* is intended to complement other cost-effectiveness measurements and corridor performance evaluations, not be used instead of them. The *BRT Standard* should be used in tandem with a cost-effectiveness or cost-benefit evaluation to help guide decision-making in the appraisal, such as the U.S. Federal Transit Administration's cost-effectiveness analysis or the internal rate-of-return analysis required by development banks during project appraisal. It is not a replacement for cost-benefit appraisals.


49
423
6691
MELS
ITCHEN
ONLY

BRT STANDARD RANKING AND SCORING PROCESS

Certifying a BRT corridor as gold, silver, bronze, or basic sets an internationally recognized standard for the current best practices for BRT and can only be done with the full score (Design + Operational Deductions) six months after opening to allow usage and operations to be more representative of longer-term patterns. The combination of the design evaluation (positive points) and operational evaluation (negative points) gives the final score––the full score––from the *BRT Standard*. Full scores are the most complete and realistic indicator of BRT corridor quality and performance.

The maximum number of points a corridor can earn is 100. Bronze, silver, and gold rankings reflect well-designed corridors that have achieved excellence. A ranking of basic BRT means that the corridor meets the minimum criteria to qualify as BRT, which is still an achievement and should be acknowledged. However, since it has not quite reached the same level of excellence as those that have received bronze, silver, or gold awards, it does not receive a certificate.

GOLD-STANDARD BRT

85 POINTS OR ABOVE

Gold-standard BRT is consistent in almost all respects with international best practices. These corridors achieve the highest operational performance and efficiency while providing a high quality of service. The gold level is achievable on any corridor with sufficient demand to justify BRT investments. These corridors have the greatest ability to inspire the public and other cities.

SILVER-STANDARD BRT

70 - 84.9 POINTS

Silver-standard BRT includes most of the elements of international best practices. These corridors achieve high operational performance and quality of service.

BRONZE-STANDARD BRT

55 - 69.9 POINTS

Bronze-standard BRT solidly meets the definition of BRT and is mostly consistent with international best practices. Bronze-Standard BRT has some characteristics that elevate it above the BRT Basics, achieving higher operational efficiencies or quality of service than basic BRT.

BASIC BRT

Basic BRT refers to a core subset of elements that the Technical Committee has deemed essential to the definition of BRT. This minimum qualification is a precondition to receiving a gold, silver, or bronze ranking.

Minimum Requirements for a Corridor to Be Considered BRT

1. At least 3 kilometers (1.9 miles) with dedicated lanes.

2. A score of 4 or more points in the dedicated right-of-way element.

3. A score of 4 or more points in the busway alignment element.

4. A score of 20 or more total points across all five BRT Basics elements.


TO-003
TO-003
Mi Macro
Mi Movilidad

Mi Macro Periférico in Guadalajara, Mexico, was a transformative investment in the peripheral areas of the metro region. It features new sidewalks and bike lanes along the corridor, bathrooms and lactation rooms at stations, universal accessibility, safe crossings, and well-lit, visibly transparent, wide stations, among other features. **SOURCE:** Jalisco State Government

Cities and agencies are welcome to submit their assessment and ask for certification. Scores are submitted to the Technical Committee and are verified by individual members of the Technical Committee. The *BRT Standard* Technical Committee only verifies full scores. To be officially certified, at least one committee member must verify the scores; ideally more than one person scores each corridor. Once a score has been verified, it may be released to the public. The Technical Committee will support efforts to promote the corridor ranking and issue a certificate to the city or agency.

All bus transit corridors that have not been scored previously are eligible for scoring; previously scored corridors may be rescored upon request if they have experienced significant changes in design or operations since the last time they were evaluated. When a corridor is rescored, the justification for rescoring the corridor will also be noted when the new score is released.

The *BRT Standard* Technical Committee and the Institutional Endorsers look forward to making this an even stronger tool for creating better BRT corridors and encouraging better public transport that benefits cities and citizens alike.

For any questions on the scoring process or to request a scoring, please contact brtstandard@itdp.org.

THE BRT STANDARD SCORECARD

The IndyGo Red Line in Indianapolis, USA, has real-time informtion screens, ADA accesible, ample, and elevated platforms as shown in the 66th Street station.
CREDIT: IndyGo Bus


IndyGo RAPID
90 UNIVERSIT
SAFE PLACE

DESIGN (+100 Total Points)

BRT BASICS

BRT BASICS	Maximum Score 35
Dedicated Right-of-Way	7
Busway Alignment	7
Off-board Fare Collection	7
Intersection Treatments	7
Platform-level Boarding	7

SERVICE PLANNING

SERVICE PLANNING	Maximum Score 18
Multiple Routes	4
Control Center	3
Demand Profile	3
Hours of Operations	3
Multi-corridor Network	2
Business Model	3

STATIONS AND BUSES

STATIONS AND BUSES	Maximum Score 23
Passing Lanes at Stations	3
Minimizing Bus Emissions	3
Stations Set Back from Intersections	2
Center Stations	2
Pavement Quality	2
Distance Between Stations	2
Customer-friendly Stations	3
Greening Measures and Resiliency	1
Number of Doors on Bus	2
Independent Docking	2
Sliding Doors at BRT Stations	1

COMMUNICATIONS

Maximum Score 8

Branding	2
Passenger Information	4
Passenger Communication and Data Collection	2

ACCESS AND INTEGRATION

Maximum Score 16

Universal Access	3
Integration with Other Public Transport	2
Pedestrian Access and Safety	4
Secure Bicycle Parking	1
Bicycle Lanes	2
Bikeshare Integration	1
Personal Security and Gender-based Violence	3

OPERATIONAL DEDUCTIONS (-77 Total Points)

POINT DEDUCTIONS

Maximum Score -77

Poorly Maintained Infrastructure	-14
Overcrowding	-10
Low Commercial Speeds	-10
Lack of Enforcement of Right-of-Way	-7
Significant Gap Between Bus and Platform	-7
Long Signal Cycles	-7
Bus Bunching / Reliability	-6
Buses Running Parallel to BRT Corridor	-4
Low Peak Frequency	-3
Low Off-peak Frequency	-3
Low Peak Passengers	-3
Pedestrians and Cyclist Fatalities along Corridor	-2
Permitting Unsafe Bicycle Use	-1

SCORING SYSTEM IN DETAIL


TransMilenio
$5.000
$5.500

DEFINITION OF A BRT CORRIDOR

The *BRT Standard* should be applied to specific BRT corridors rather than a BRT system as a whole. This is because the quality of BRT in cities with multiple corridors can vary significantly. For the purposes of the *BRT Standard*, a BRT corridor is defined as:

> **A section of road or contiguous roads served by a bus route or multiple bus routes with a minimum length of 3 kilometers (or 1.9 miles) that has dedicated bus lanes. A corridor is defined by its infrastructure and not by what routes or services run on it. We encourage multiple routes and service designs, but for purposes of scoring the corridor, it may not align with how the city defines the routes.**

Three kilometers is the minimum length required because it shows the intention of having a system large enough to connect many destinations meaningfully. Less than that implies that this is not serving a mass transport purpose. Another reason for defining the corridor in this way is that in some cities, BRT is not prioritized over automobile traffic, an essential element in rapid transit that improves efficiency and cost. To avoid rewarding corridors that do not make this political choice, the corridor must include dedicated bus lanes.

Spurs—short sections of dedicated bus lanes that connect to a middle section of the primary bus corridor—are considered part of the primary corridor if they are less than three kilometers (1.9 miles) in length. Similar sections of dedicated bus lanes that are greater than three kilometers (1.9 miles) in length are considered separate corridors.

The *BRT Standard* can be applied to new corridors to see how well they achieve the Standard or used to measure existing corridors and help to identify how to improve or retrofit those corridors from a design and operational perspective.

PREVIOUS PAGE: Las Aguas TransMilenio Station has one of the so-called "Meeting Points", where you can find bicycle parking, restrooms, cafeteria and a tourist service point. **CREDIT:** ITDP

THE BRT BASICS

The Dar es Salaam BRT scores highly in the BRT basics, setting the foundation for a system that moves over 200,000 people per day.
CREDIT: ITDP

The “BRT Basics” are a set of elements that the Technical Committee has deemed essential to defining a corridor as BRT. These five elements most critically contribute to eliminating sources of delay from congestion, conflicts with other vehicles, and passenger boarding and alighting, thus increasing efficiency and reliability, while lowering operating costs. They are of critical importance in differentiating BRT from standard bus service. The five essential elements of BRT (and their maximum scores) are:

- Dedicated right-of-way (7 points)
- Busway alignment (7 points)
- Off-board fare collection (7 points)
- Intersection treatments (7 points)
- Platform-level boarding (7 points)

MINIMUM REQUIREMENTS FOR A CORRIDOR TO BE CONSIDERED BRT

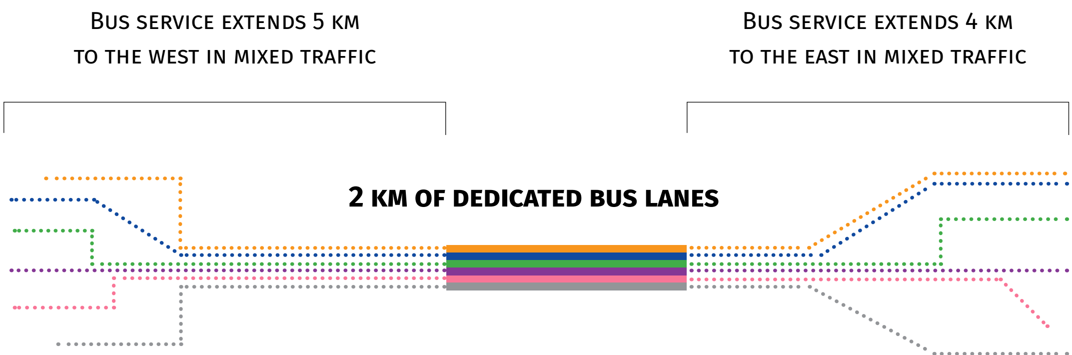
1. At least 3 kilometers (1.9 miles) with dedicated lanes.
2. A score of 4 or more points in the dedicated right-of-way element.
3. A score of 4 or more points in the busway alignment element.
4. A score of 20 or more total points across all five BRT Basics elements.

EXAMPLES OF BRT CORRIDORS

Example 1: A 3-kilometer (1.9 mile) corridor

Example 2: A 3-kilometer (1.9 mile) corridor

Example 3: NOT a corridor



DEDICATED RIGHT-OF-WAY

7 points maximum

A dedicated right-of-way ensures that buses can move quickly and unimpeded by congestion. Physical design is critical to the self-enforcement of the right-of-way. Dedicated lanes matter the most in heavily congested areas where it is harder to repurpose mixed-traffic lanes as a busway.

Dedicated lanes can be separated from other vehicle traffic in different ways, but physical separation typically results in the best compliance and the easiest enforcement. Physical separation includes a physical impediment to entering and exiting the lanes. Some physical barriers, such as fences, prevent vehicles from entering and exiting bus lanes entirely, while other barriers, such as curbs, can be carefully mounted to enter or exit the bus lanes. In some designs, the bus stations themselves can act as barriers. Some permeability is generally advised, as buses occasionally break down and block the busway or otherwise need to leave the corridor.

While the definition of a BRT corridor requires at least 3 kilometers (1.9 miles) of dedicated bus lanes, this element evaluates the quality of the segregation throughout the corridor, including sections without dedicated lanes. A bus-only transit way is considered dedicated even when local traffic is allowed for one block and does not block the busway.

In Guadalajara, Mexico, buses operate in a dedicated lane, protected from the mixed traffic lanes by separator blocks. **CREDIT:** Jalisco State Government

BRT Basics: This is an element of BRT deemed essential to true BRT corridors. A minimum score of 4 must be achieved on this element for a corridor to be defined as BRT.

Scoring Guidelines: The score is calculated by multiplying the percentage of the corridor that has each type of dedicated right-of-way for BRT services by the number of points associated with the type of dedication. Corridor segments that permit the use of taxis, motorcycles, high-occupancy vehicles, and other nonemergency vehicles are not considered to have dedicated lanes. The maximum score for this element is 7 points.

Type of Dedicated Right-of-Way	Points	Weighted By
Physically separated, dedicated lanes	7	% of corridor with type of dedicated right-of-way
Dedicated lanes enforced with technological surveillance measures (i.e., closed-circuit television or CCTV, radar)	6	
Color-differentiated, dedicated lanes with no physical separation	5	
Dedicated lanes separated by a painted line	4	
No dedicated lanes	0	

BUSWAY ALIGNMENT

7 points maximum

The busway is best located where conflicts with other traffic can be minimized, especially from turning movements from mixed-traffic lanes. In most cases, a busway in the central verge of a roadway encounters fewer conflicts with turning vehicles than those adjacent to the curb due to alleys, parking, etc. Additionally, while delivery vehicles and taxis generally require curb access, the road's central verge usually remains free of such obstructions. All the design configurations recommended below are related to minimizing the risk of delays caused by turning conflicts and curbside access.

BRT Basics: This is an element of BRT deemed essential to true BRT corridors. A minimum score of 4 must be achieved on this element for a corridor to be defined as BRT.

Scoring Guidelines: This scoring is weighted using the percentage of the corridor of each configuration multiplied by the points associated with that configuration and then adding those numbers together. The maximum score for this element is 7 points.

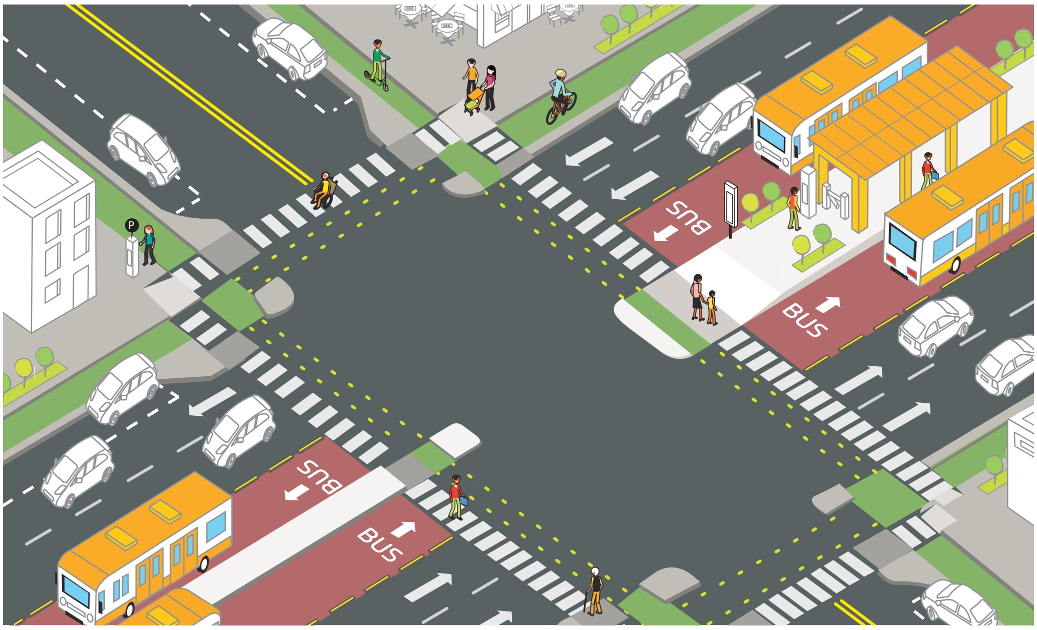
Rea Vaya's BRT system in Johannesburg, South Africa, splits into one-way pairs that are centrally aligned when it enters the downtown. This segment would score 5 points.
CREDIT: ITDP

Trunk Corridor Configurations	Points	Weighted By
TIER 1 CONFIGURATIONS		% of corridor with configuration
Two-way, median-aligned busway in the central verge of a two-way road	7	
Bus-only corridor with a fully exclusive right-of-way and no parallel mixed traffic, such as a transit mall (e.g., Bogotá, Colombia; Dar es Salaam, Tanzania; and Quito, Ecuador) or a converted rail corridor (e.g., Cape Town, South Africa, and Los Angeles, USA)	7	
Busway that runs adjacent to an edge condition like a waterfront or park where there are few intersections to cause conflicts	7	
Busway that runs two-way on the side of a one-way street	6	
TIER 2 CONFIGURATIONS		
Busway that is split into two one-way pairs on separate streets, with each bus lane centrally aligned in the roadway	5	
Busway aligned to the outer curb of the central roadway on a street with a central roadway and parallel service road	4	
Busway aligned to the inner curb of the service road on a street with a central roadway and parallel service road. Busway must be physically separated from other traffic on the service road to receive points	3	
Busway that is split into two one-way pairs on separate streets, with each bus lane aligned to the curb	3	
TIER 3 CONFIGURATIONS		
Virtual busway that operates bidirectionally in a single median lane	1	
NON-SCORING CONFIGURATIONS		
Curb-aligned busway on a two-way road	0	

EXAMPLES OF BUSWAY CONFIGURATIONS

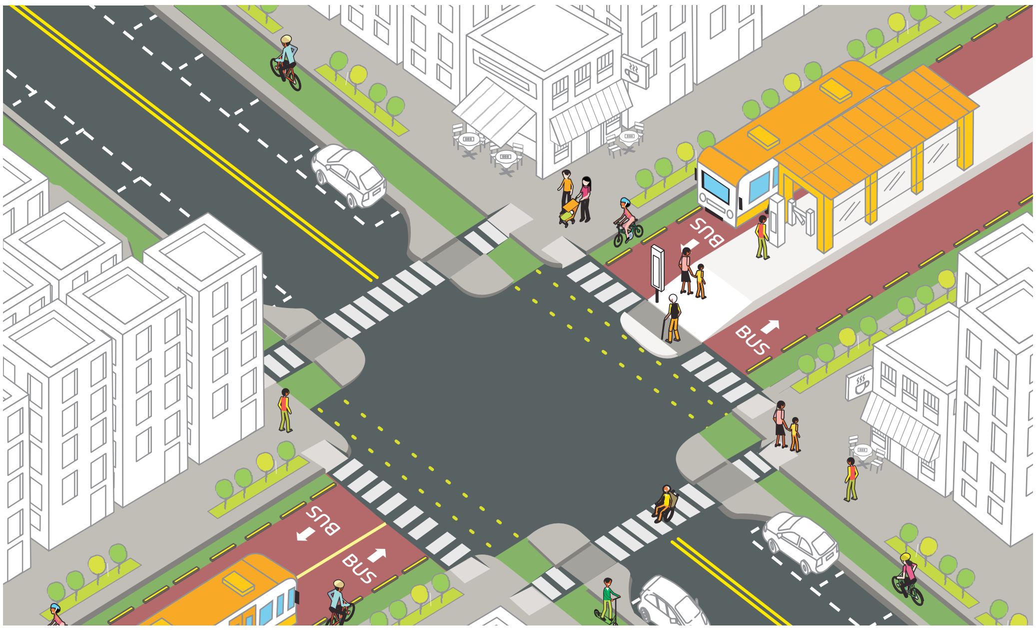
These sections are only meant as examples and are not inclusive of all possible configurations.

TIER 1
CONFIGURATION EXAMPLES



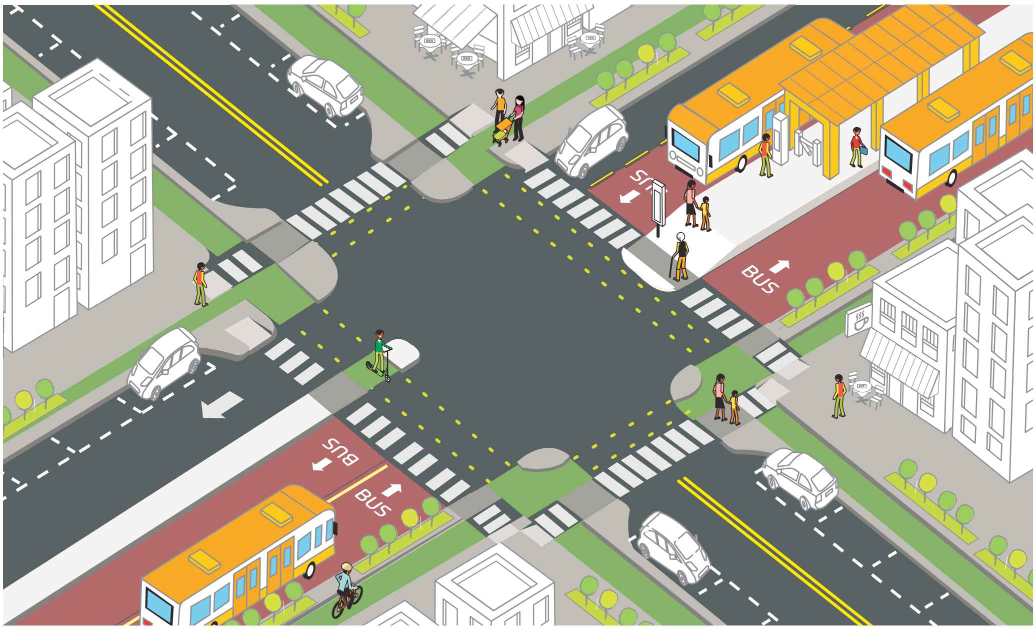
Two-way, median-aligned busway that is in the central verge of a two-way road

7 points



Bus-only corridor where there is an exclusive right-of-way and no parallel mixed traffic

7 points



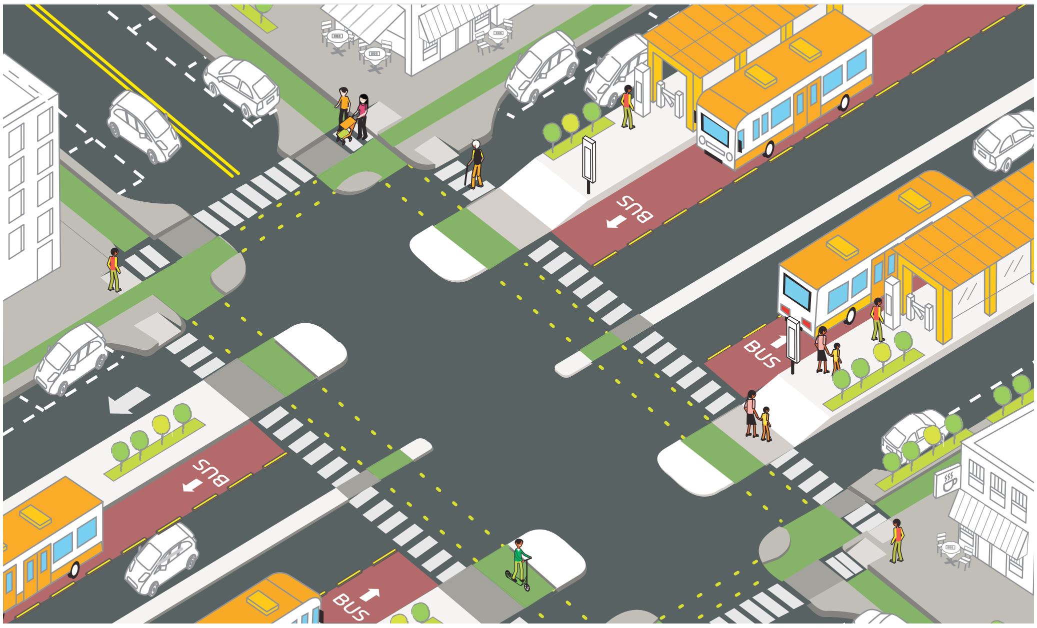
Two-way busway that runs on the side of a one-way street

6 points

TIER 2
CONFIGURATION EXAMPLES

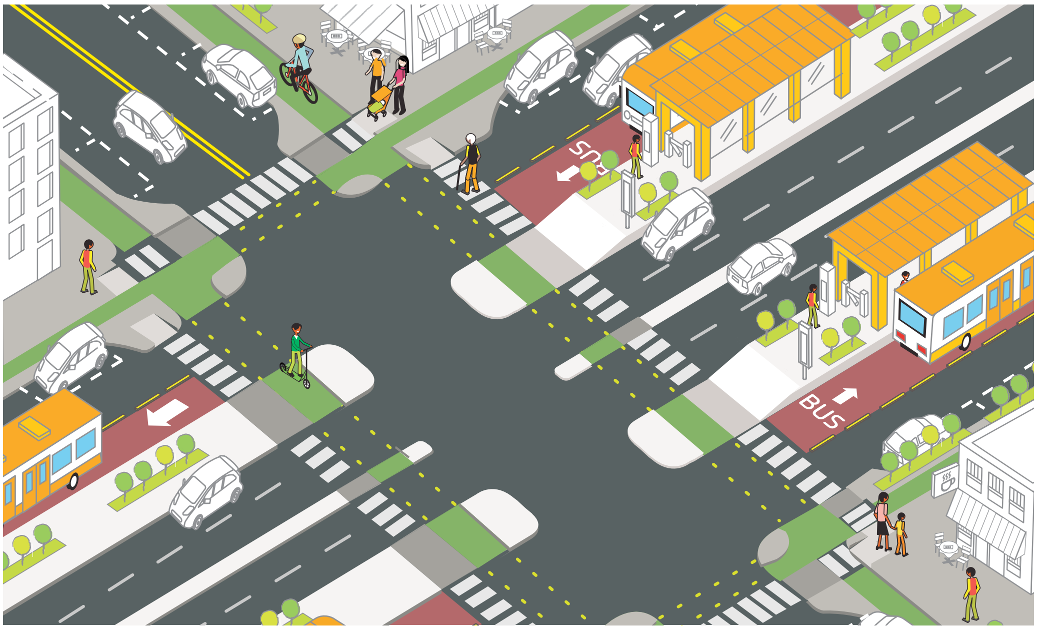
Busway that is split into one-way pairs on separate street and centrally aligned in the roadway

5 points



Busway that is aligned to the outer curb of central road section
in street with a central roadway and parallel service road

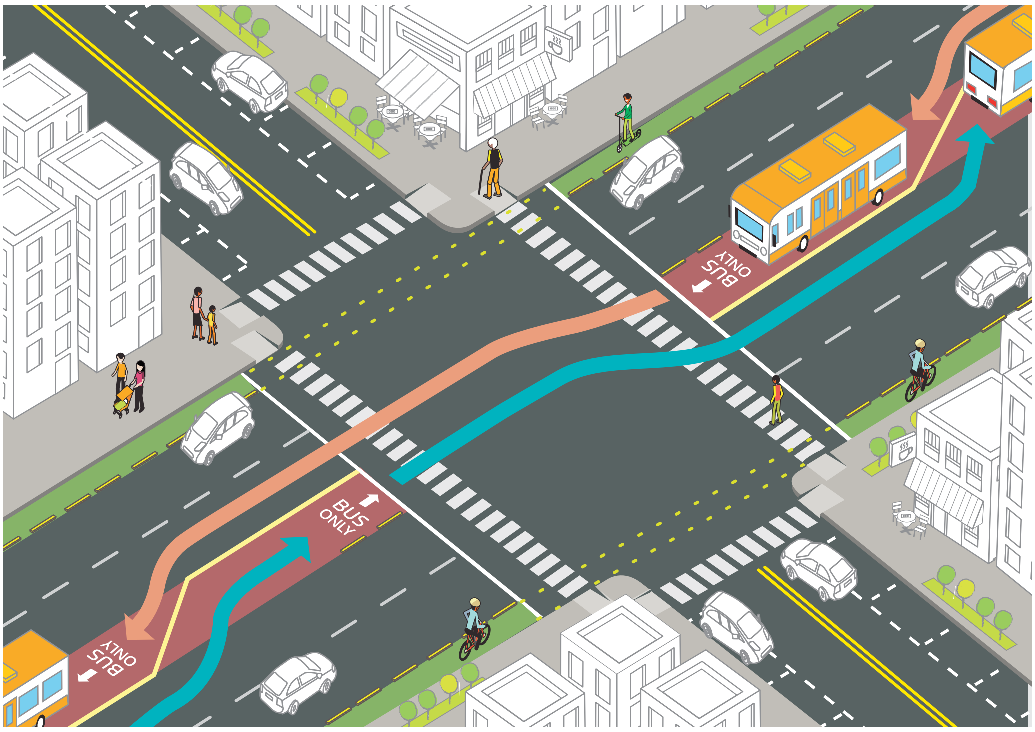
4 points



Busway that is aligned to the inner curb of service road in
street with central roadway and parallel service road

3 points

TIER 3
CONFIGURATION EXAMPLE



Virtual busway that operates bidirectionally in a single median lane

1 point

A virtual busway is a single bus lane in the middle of a nonreversible roadway but is shared between the two directions of travel (as seen in Rouen, France). The direction of travel within the bus lane depends on the need for queue jumping within the corridor. At the intersections, a separate public-transport vehicle phase will allow the BRT vehicles to leave the virtual lane and access the general traffic lane, after which it will proceed in the general traffic lane until the virtual lane is once again dedicated to the BRT vehicle's direction of travel.

OFF-BOARD FARE COLLECTION

7 points maximum

Off-board fare collection is one the most important factors in reducing travel time and improving the passenger experience, especially for caregivers traveling with young children, people with disabilities, and older people. This can also be achieved by having no fares––a fare-free system increases the efficiency of boarding and alighting.

If fares are collected, turnstile-controlled and proof-of-payment are the two most effective approaches to off-board fare collection. For turnstile-controlled fare collection, passengers pass through a gate, turnstile, or checkpoint upon entering the station where their ticket is verified or a fare is deducted. For proof-of-payment fare collection, passengers pay at a kiosk and collect paper tickets or passes with the payment marked (or via a smartphone app or SMS)—these are occasionally checked on board the vehicle by an inspector. Both approaches can significantly reduce delays. However, turnstile-controlled is preferable because:

- It is easier to accommodate multiple routes using the same BRT infrastructure without modifying the entire fare collection system for the entire urban transit network;
- It minimizes fare evasion, as every passenger must have his/her ticket scanned in order to enter the system versus proof-of-payment, which requires random checks; and
- Proof-of-payment can cause anxiety for passengers who may have misplaced tickets and who may experience biased enforcement practices.

The proof-of-payment systems on bus routes (that go beyond BRT corridors) extend the benefits of time savings to those sections of the bus routes that lie beyond the BRT corridor.

A third approach, onboard fare validation, directs passengers to purchase tickets/fares before boarding and validate them on the vehicle through rapid electronic readers available at all bus doors or use a system of instant purchase via contactless means (e.g., tapping a credit card or smartphone). While this provides time savings for passengers, it is not as efficient as turnstile-controlled or proof-of-payment systems, as it takes time for passengers to swipe even with a phone. Points are not awarded if fare validation or contactless payment options are only offered at the front door or if they require the use of a conductor.

A person purchases a fare at a ticket kiosk before entering the TransPeshawar BRT system.
CREDIT: Asian Development Bank (ADB)

Once the ticket is bought or the fare card is topped up, people enter TransPeshawar through turnstiles, which deduct the fare. Peshawar, Pakistan.
CREDIT: Asian Development Bank (ADB)

Contactless payment options should be considered as they can be less expensive and generate less waste.

BRT Basics: This is an element of BRT deemed essential to true BRT corridors.

Scoring Guidelines: to be eligible for scoring, off-board fare collection must occur during all operating hours. Scores are weighted by the percentage of either stations or routes on the corridor that utilize that payment system. The maximum score for this element is 7 points.

Off-Board Fare Collection	Points	Weighted By
Fare-free services	7	% routes using corridor bus infrastructure
Turnstile-controlled	7	% stations on corridor
Proof-of-payment	5	% routes using corridor bus infrastructure
Onboard fare validation—all doors	4	% routes using corridor bus infrastructure

INTERSECTION TREATMENTS

7 points maximum

There are several ways to reduce bus delays at intersections, all of which aim to increase the green-signal time for the bus lane. Having no intersections is the most effective way to reduce delay for buses, such as with grade separation or by prohibiting cross-traffic flows across the busway. However, this may negatively affect pedestrian access without thoughtful design (see the Pedestrian Access and Safety metric). Forbidding turns across the bus lane and minimizing the number of traffic-signal phases where possible is the next most effective option.

Traffic-signal priority, when activated by an approaching BRT vehicle, is useful on low- and medium-frequency corridors but is less effective than turn prohibitions.

While a better measure of intersection delay for BRT is green cycle time (reducing time between green signals for BRT services), it is harder to collect data on this in the planning stage and for the whole corridor. This is accounted for in the Point Deduction section with the Long Signal Cycles metric, but it should be considered when designing BRT corridors. The green phase for BRT vehicles in each direction should be at least 40% of the total cycle time.

The Van Ness corridor in San Francisco, USA, has center running lanes and bans most left turns across the busway. **CREDIT:** Pi.1415926535 via Wiki Commons

BRT Basics: This is an element of BRT deemed essential to true BRT corridors.

Scoring Guidelines: Scores are based on two factors: banning turns and signal priority. The points for each are added together for the final score. Full points are awarded if there are no turns across the busway, such as a grade-separated busway. A maximum of 7 points is possible for this element.

Intersection Treatments	Points
NO INTERSECTIONS	
No intersections with cross streets 100% of the corridor	7
WITH INTERSECTIONS	
Add points from each type of intersection treatment for a maximum total points of 7	
TURNS PROHIBITED	
> 80% of turns prohibited across the busway	7
70-80% of turns prohibited across busway	6
60-70% of turns prohibited across busway	5
50-60% of turns prohibited across busway	4
40-50% of turns prohibited across busway	3
30-40% of turns prohibited across busway	2
20-30% of turns prohibited across busway	1
< 20% of turns prohibited across busway	0
SIGNAL PRIORITY	
> 70% of intersections have signal priority	2
30-70% of intersections have signal priority	1
< 30% of intersections have signal priority	0

PLATFORM-LEVEL BOARDING

7 points maximum

The interface between the bus and the platform affects the speed of boarding and alighting. This interface also determines whether the system is accessible to passengers with limited mobility, such as persons with disabilities, older people, young children, or passengers with suitcases or strollers.

Safe boarding and alighting require minimizing horizontal and vertical gaps at the interface. "Horizontal gap" refers to the longitudinal distance between the bus station and the platform. "Vertical gap" refers to the height difference between the bus floor and the station platform.

Low-cost measures are readily available to minimize and even eliminate gaps. For example, a boarding bridge extends from the bus to the platform and provides a safe and easy path for all passengers with zero gap. Systems also use alignment curbs (e.g., kassel curbs) and road markers to guide the vehicle into an exact position. These guidance mechanisms greatly speed up the docking process. Visual techniques are also possible, including camera guidance, allowing the driver to align the bus to road markings while viewing a display screen on the driver console. Poor calibration/maintenance of the articulation/joint of buses can also lead to wider horizontal gaps in the rear of the bus.

A vertical gap of over 2 centimeters (0.75 inches) makes entry for persons with wheelchairs quite difficult, with many unable to mount a step of this height. In addition, vertical gaps represent dangerous tripping points for all passengers and slow down the boarding and alighting process. A boarding bridge may have a height difference between the bus and platform to allow deployment of the bridge, and if the slope of the ramp is less than 1:12 slope ratio creating an 8.3% grade, then the vertical gap for a boarding bridge is considered zero.

A horizontal gap of over 15 centimeters (6 inches) also makes entry for a person with a wheelchair difficult and dangerous. The common size of the front wheel of a wheelchair is 15 centimeters (6 inches), so a gap greater than 10 centimeters is difficult to navigate safely. Horizontal gaps are also hazardous for young children, families with strollers, and persons using mobility assists and canes.

BRT Basics: This is an element of BRT deemed essential to true BRT corridors.

Scoring Guidelines: Buses with an average vertical gap greater than 2 centimeters (0.75 inches) between the bus floor and the station platform do not qualify as "platform level." Buses with steps inside them also will not count as "platform level." Scores for each element are first weighted by the percentage of platform-level buses (A) and then weighted by the percentage of stations that have measures to reduce the horizontal gap (B, C, and D). (See examples below table.) A maximum of 7 points is possible for this element.

Level boarding makes it easier for people to board and alight, especially caregivers traveling with young children, like those shown here on the Rainbow system in Pune/Pimpri-Chinchwad, India. **CREDIT:** ITDP

Platform-level Boarding	Points
Platform-level Boarding Score = A * (B*7 + C*5 + D*3)	
A = % of buses and stations where vertical gap between platform and vehicle is less than 2cm (0.75 in) AND no stairs inside the bus	(The points awarded in B, C, and D below are reduced by the % of buses/stations that don't meet criteria)
B = % of buses or stations where horizontal gap is always zero through use of boarding bridge or other such device	7
C = % of buses or stations where horizontal gap is always 10 cm or less through the use of fixed position device (e.g., electronic guidance system, physical guidance system, alignment channels, etc.)	5
D = % of stations where horizontal gap is typically 15 cm or less through the use of "soft" measures, such as vehicle alignment tape and road markings	3

Example 1:
A) 10% of stations have a vertical gap
B) Not applicable
C) 80% of stations have kassel curbs (physical guidance system)
D) 20% of stations have road markings
Score is: (100%-10%) * (80% * 5 + 20% * 3) = 4.14

Example 2:
A) 30% of buses have internal steps
B) 50% of buses have boarding bridges
C) Not applicable
D) 100% of stations have visual guidance systems
Score is: (100% - 30%) * (50% * 7 + 100% * 3) = 4.55

SERVICE PLANNING

People access the BRT in Medellín, Colombia, in stations that are covered and open with green space.
CREDIT: ARQUIURBANO

MULTIPLE ROUTES

4 points maximum

Travel-time savings and the avoidance of transfers are two of the characteristics customers most value. Having multiple routes and types of routes (express, limited, and local services) operate on a single corridor is a good proxy for reduced door-to-door travel times by reducing transfer penalties and increasing travel speeds by providing different service options on medium and high-volume corridors. Systems that offer limited-stop services (i.e., express or semi-express services) have reduced travel times by more than 50%.

Multiple routes and/or types of routes can include:

- Routes that operate over multiple corridors, as with Metrobús in Mexico City.
- Multiple routes operating in a single corridor that go to different destinations once they leave the corridor, as with Guangzhou, China, and MIO in Cali, Colombia.
- Limited-stop services that skip lower-demand stations and stop only at major stations that have higher passenger demand, as with TransMilenio in Bogotá, Colombia.
- Express services that collect passengers at stops at one end of the corridor, travel along much of it without stopping and drop passengers off in the city center or at the other end, as with TransOeste in Rio de Janeiro, Brazil.

The first phase of the DART BRT system in Dar es Salaam, Tanzania, has multiple routes serving different parts of the metropolitan area.
CREDIT: ITDP

The infrastructure necessary for the inclusion of express, limited-stop, and local BRT services (passing lanes at stations, multiple docking bays and sub-stops) is captured in other scoring metrics.

Scoring Guidelines: To qualify for points, routes must operate all day in both directions.

Low-frequency corridors (less than 10 buses per hour) are not required to have multiple services to meet this requirement. Medium-frequency corridors are rewarded for having more than one route, but having only one route doesn't disqualify them from earning points. High-frequency corridors (greater than 20 buses per hour) should have a combination of bus routes and different types of service to meet this requirement.

Multiple Routes / Express, Limited-stop, Local Service		Points
Corridors with low frequency (< 10 buses/hour)	(no requirement)	4
Corridors with medium frequency (10-20 buses/hour)	Two or more routes exist on the corridor, servicing at least two stations	4
	One route on the corridor	2
Corridors with high frequency (> 20 buses/hour)	Requirement for points: Two or more routes exist on the corridor, servicing at least two stations	If yes, see below If no, 0 points
	Local services and multiple types of limited-stop and/or express services	4
	At least one local and one limited-stop or express service option	2
	No limited-stop or express services	1
	One route on the corridor	0

CONTROL CENTER

3 points maximum

Control centers for BRT systems are increasingly prevalent, allowing operators to directly monitor bus operations and personal security, identify problems, and rapidly respond to them. This can save users time and improve the quality and security of the BRT service.

A full-service control center monitors the locations of all buses (using GPS or similar technology), as well as passenger security, and it can:

- respond to incidents in real-time
- control the spacing of buses
- determine and respond to the maintenance status of all buses in the fleet
- record passenger boarding and alighting for future service adjustments
- track buses and monitor performance using computer-aided dispatch /automatic vehicle location
- support, report, and monitor passenger security concerns

There should only be one control center, managed by a public agency, on each corridor. Ideally, the control center is integrated with the traffic signal and emergency response systems. The control center can also be responsible for housing and monitoring passenger communications functions, but these functions are assessed in the Passenger Information and Passenger Communications and Data Collection metrics.

The BRT control center in Rio de Janeiro, Brazil, monitors and controls service across the system. **CREDIT:** Juan Melo

Scoring Guidelines: The following four elements are part of a full-service control center: 1) automated dispatch, 2) active line management procedures, 3) automatic vehicle location, and 4) passenger security mechanisms.

Control Center	Points
Full-service control center with all four services	3
Control center with three of the four services	2
Control center with two of the four services	1
Control center with one or fewer of the four services or center with limited functionality	0
AND	
Multiple control centers on corridor	Subtract 1 from score above (min score = 0)
Control center not supervised by public agency	Subtract 1 from score above (min score = 0)

DEMAND PROFILE

3 points maximum

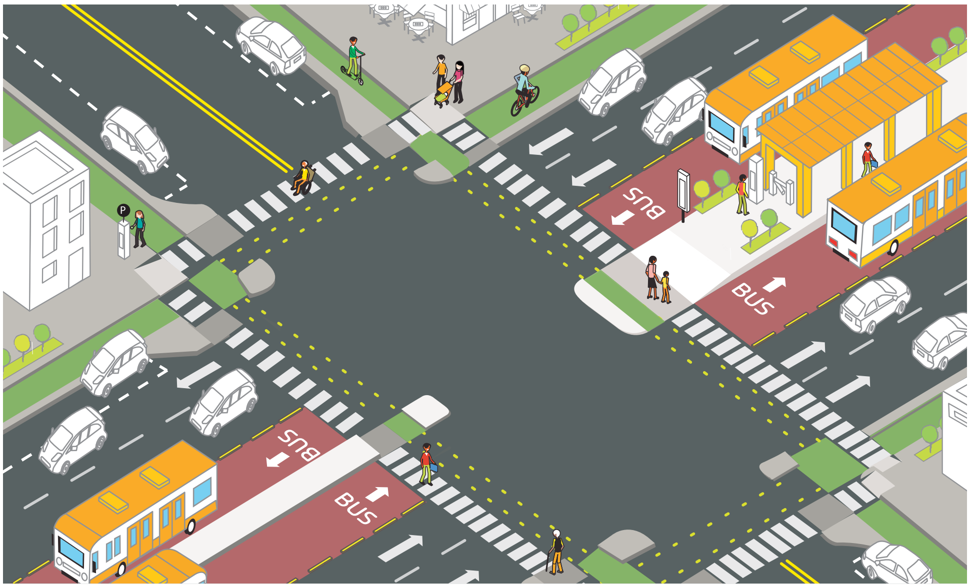
Building dedicated BRT infrastructure in the highest-demand segments of a road ensures that the greatest number of passengers benefit from the improvements. This is most significant when the decision is made whether or not to build a corridor through a downtown area; however, it can also be an issue outside of a downtown on road segments with particularly high demand. Building BRT infrastructure through the highest-demand parts of a route will save users time and improve the quality of the service.

Scoring Guidelines: The BRT corridor must include dedicated infrastructure for the road segment with the highest demand within 2 kilometers (1.2 miles) of either end. This segment should also have the highest quality of busway alignment, and the score thus relates to that. The trunk corridor configurations defined in the Busway Alignment Section (see page 37) are used here to score the demand profile.

Demand Profile	Points
Corridor includes highest-demand segment, which has a Tier 1 Trunk Corridor configuration	3
Corridor includes highest-demand segment, which has a Tier 2 Trunk Corridor configuration	2
Corridor includes highest-demand segment, which has a Tier 3 Trunk Corridor configuration	1
Corridor does not include highest-demand segment	0

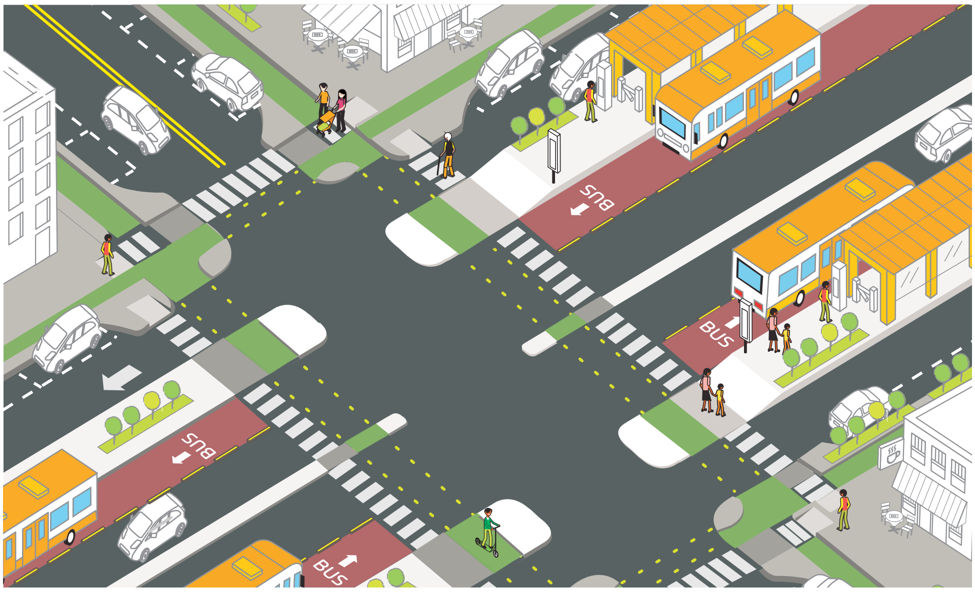
Examples of Bus Alignment from Pages 37 - 42

TIER 1 CONFIGURATION



Two-way, median-aligned busway that is in the central verge of a two-way road

TIER 2 CONFIGURATION



Busway that is aligned to the outer curb of central road section in street with a central roadway and parallel service road

HOURS OF OPERATION

3 points maximum

A viable transit corridor with a high quality of service (at least four trips per hour) must be available to passengers for as many hours throughout the week as possible. Otherwise, passengers could end up stranded or may seek another mode of transport.

Many people, especially in the service and informal sectors, work outside of peak commute hours on weekdays but depend on public transport to get them to their destinations. For example, many caregivers travel for household responsibilities early in the morning, in the afternoon, or on weekends. Students often travel early in the morning or afternoon. Public transport needs to serve those trips when they are needed.

Scoring Guidelines: This metric measures the daily number of operating hours, with a minimum of four bus trips in each direction each hour, all days of the week to be counted. If frequency drops below 4 buses an hour, then those periods of time do not qualify as part of the daily hours of operation.

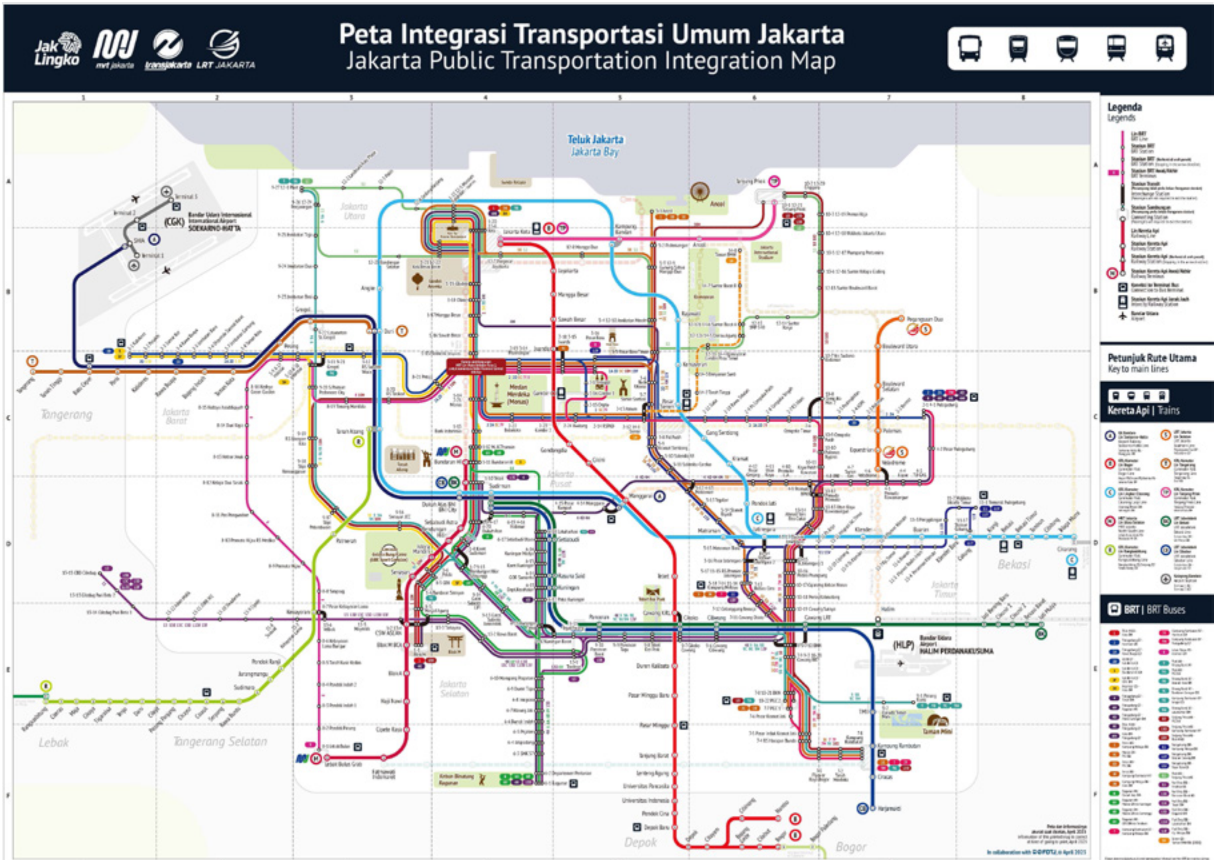
The BRT in Yichang operates between 18 and 19 hours a day for 7 days a week, allowing people to travel for all trips using the corridor. **CREDIT:** ITDP

Daily Hours of Operation (Minimum)	Points
> 20 hours/day on both weekdays and weekends	3
18 - 19 hours/day on both weekdays and weekends	2
16 - 17 hours/day on both weekdays and weekends	1
< 16 hours/day on both weekdays and weekends	0

MULTI-CORRIDOR NETWORK

2 points maximum

For a BRT corridor to truly function well for its riders, it needs to be part of a BRT network that includes multiple intersecting corridors. This expands passenger travel and makes the system more viable as a whole, improving user service. When designing a new system, some anticipation of future corridors is useful to ensure that the current designs will be compatible with future corridors. For this reason, we reward long-term BRT planning and particularly near-term connectivity to an existing corridor or one under construction.



The 13-corridor TransJakarta network brings BRT service within a 5-minute walk of 80 percent of the population. **CREDIT:** TransJakarta

Multi-corridor Network	Points
BRT corridor connects to an existing BRT corridor or one under construction	2
BRT corridor connects to a future planned corridor in the BRT network	1
No connected BRT network planned or built	0

BUSINESS MODEL

3 points maximum

The contract structure for bus operations can have a significant impact on the success of a BRT. Contract incentives can determine how strongly operators focus on quality operations and customer service.
Best practices for bus operator business models include:

1. **Gross-cost contracting.** Compensating the bus operators based on vehicle kilometers delivered rather than passenger numbers can encourage a greater quality of service. This type of contracting can also avoid actions that are unsafe and/or inconvenient to customers, including speeding and inconsistent dwell times. Many systems have contracts with hybrid payment mechanisms, based in part on gross-based contracting with a vehicle-kilometers payment, and contracting payment based on passenger numbers to share some element of the revenue risk. In that case, at least 70 percent of the contract should be based on vehicle kilometers delivered.
2. **Performance-based awards and penalties.** The contracting structure can directly award and/or penalize operators depending on the quality of their performance. Penalties for speeding, running red lights, late dispatch, or poor headway management can deter such behaviors. Likewise, awarding on-time performance, cleanliness, and user-friendliness can focus operator attention on customer service.

The BRT business model, including contracting and operators, is critical to providing high-quality BRT service. Drivers, like the one here from the Viva BRT system in York, Canada, are often critical elements in ensuring good service.
CREDIT: ITDP

3. **Independent fare collection.** By separating fare collection from operations, transit can control the flow of revenue and ensure high-quality service.
4. **Data sharing provisions.** To manage operations, transport agencies must be able to access data related to service provision. Contracts must stipulate that the data produced by bus operations is owned by the government or transport agency, and that the government or transport agency is able to physically access vehicles to install and maintain data monitoring equipment as necessary.
5. **Competitive Tendering.** Competitive tendering helps potentially reduce the costs of providing services, gives the government some leverage in negotiations to increase the quality of service, and may be a requirement of government procurement standards or development banks.
6. **Multiple Operators.** Multiple operators allow the transit agency to have multiple companies to negotiate with for help during crises and to break up the possibility of a monopoly. Some systems may not be large enough to support multiple operators or allow for multiple operators but only have one, in which case this practice would count as implemented.

Scoring Guidelines: The scoring is determined by the number of best practices implemented. A maximum of 3 points is possible.

Business Model	Points
5 or 6 of the best practices are met	3
3 or 4 of the best practices are met	2
2 of the best practices are met	1
0 to 1 of the best practices are met	0

STATIONS AND BUSES

Fray Angélico station of the Macrobús BRT system in Guadalajara has wide ramps to facilitate access for people with disabililties.
CREDIT: ITDP

PASSING LANES AT STATIONS

3 points maximum

Passing lanes at station stops are critical to providing express and local services. They also enable stations to accommodate a high volume of buses without getting congested with buses backed up waiting to enter. On corridors with lower bus frequencies, however, it is more difficult politically to justify devoting street space to passing lanes if those lanes appear unoccupied much of the time. Passing lanes are often a good investment in the medium term, enabling multiple service options and considerable passenger travel-time savings and allowing for flexibility as a system grows.

On high-demand corridors requiring frequent service, passing lanes at stations are particularly helpful for providing sufficient corridor capacity to maintain higher speeds. Corridors with growing demand may not have high capacities initially but passing lanes can permit extensive growth in ridership without saturating the corridor. Similarly, BRT corridors may also allow buses to pass in mixed-traffic lanes, but this should only happen when the conditions make this a safe option, i.e. locations with low bus frequencies and limited mixed-traffic congestion.

TransJakarta includes passing lanes at stations to help increase station capacity while also allowing for different types of services. **CREDIT:** ITDP

Scoring Guidelines: For high-frequency corridors, count the number of stations with passing lanes by the type of passing permitted and divide by the total number of stations.

Passing Lanes at Stations		Points	Weighted By
Corridors with low-medium frequency (< 20 buses/hour)	(no requirement)	3	
Corridors with high frequency (> 20 buses/hour)	Dedicated passing lanes	3	% of stations with each type of passing lanes
	Passing in mixed traffic given safe conditions	1	
	No passing lanes	0	

MINIMIZING BUS EMISSIONS

3 points maximum

Bus tailpipe emissions are typically a large source of urban air pollution and contribute to climate change. Bus riders and people living or working near roadsides are especially at risk from these emissions. In general, the pollutant emissions of highest concern from urban buses are particulate matter (PM) and nitrogen oxides (NOx). Minimizing these emissions is critical to the health of passengers and the general urban population and creating a high-quality service that can attract and retain passengers. Climate change is also increasingly affecting our world, and nearly all vehicles will need to be electrified to avoid the most catastrophic impacts. Buses offer one of the most equitable places to begin this process of vehicle electrification.

Electric and hydrogen fuel cell buses produce no local air pollution, and the cost of these vehicles has declined significantly in recent years. While these may still produce emissions from electricity generation, research has shown electric buses still significantly reduce overall emissions.

Increasingly, hybrid buses are used as a step toward the reduction of tailpipe emissions. However, under certain conditions, hybrid buses can produce an equal or greater amount of air pollution as internal combustion engine buses.

Salvador, Brazil, opened their first BRT corridor with the commitment to electrify 30% of its BRT fleet by 2024. **CREDIT:** Beatriz Rodrigues

For fossil fuel-powered vehicles, the primary determinant of tailpipe emission levels is the stringency of governments' emissions and fuel standards. While some fuels, like natural gas, tend to produce lower emissions, new emission controls have enabled even diesel buses to meet extremely clean standards. However, "clean" fuels do not guarantee low emissions of all pollutants. As a result, the scoring for fossil fuel-powered vehicles is based on certified emissions standards rather than fuel type.

Buses that comply with Euro VI and U.S. 2010 emissions standards receive 1 point. These standards result in extremely low emissions of both PM and NOx. These standards require the use of PM traps, ultra-low-sulfur diesel fuel, and selective catalytic reduction for diesel vehicles.

Other countries have established their own emissions standards, such as the Bharat Stage Standard in India, the China National Standard, and CONAMA PROCONVE Standards in Brazil. These countries often develop their rules based on the U.S. or the Euro standards and should be relatively comparable. With Bharat, the highest standard as of 2022 is Stage VI, comparable to Euro VI and thus eligible for 1 point. Updates to the Bharat Stage Standard, however, are expected soon.

Buses also generate greenhouse-gas emissions. Since no clear regulatory framework exists that requires bus manufacturers to meet specific greenhouse-gas emission targets or fuel-efficiency standards, there is no obvious way to identify a fuel-efficient bus by vehicle type. For measuring CO_2 impacts, ITDP recommends using the Simplified Calculator of Project Emissions (SCOPE) for BRT (formerly known as TEEMP), which incorporates the *BRT Standard* into a broader assessment of project-specific CO_2 impacts. 100% Electric and hydrogen fuels offer the best way to reduce greenhouse gas emissions in buses.

Emissions Standards (Euro, U.S., or Local Equivalent)	Points	Weighted By
Zero Tailpipe Emissions (100% Electric or hydrogen fuel cell)	3	% of buses within each emission category
Hybrid Vehicles (Euro VI or U.S. 2010)	2	
Diesel Euro VI or U.S. 2010	1	
Below the above standards	0	

STATIONS SET BACK FROM INTERSECTIONS

2 points maximum

Stations should be located at a minimum of one bus length from the stop line of the intersection.

When stations are located just beyond an intersection, delays can occur when passengers take a long time to board or alight, and the docked bus blocks others from pulling through the intersection. If stations are located just before an intersection, the traffic signal can keep buses from leaving the station, thus not allowing other buses to pull in. The risk of conflict increases as frequency increases and higher frequency systems often require setbacks of 26 meters or even 40 meters to prevent backups at intersections. Separating stations from intersections is key to mitigating these problems.

Scoring Guidelines: For the near side of the intersection, the setback distance is defined as the distance from the stop line at the intersection to the front of a bus at the forward-most docking bay. For the far side of the intersection, the setback distance is defined as the distance from the far edge of the crosswalk to the back of the bus at the rear-most docking bay. A station may be exempted from the minimum setback if:

1. the stations are located on fully grade-separated busways with no intersections;
2. the frequency is less than 10 buses an hour during the peak hour.

The station of the PULSE system in Richmond, VA, USA, is one bus distance length from the intersection, allowing another bus to pull up behind it if needed.
CREDIT: ITDP

Station Location	Points
Fully grade-separated busways with no intersections	2
Frequency < 10 buses an hour during the peak hour	2
> 80% of stations are set back at least one bus length from the intersection	2
> 40% of stations are set back at least one bus length from the intersection	1
< 40% of stations are set back at least one bus length from intersection	0

CENTER STATIONS

2 points maximum

Having a single station serving both directions of the BRT corridor makes transfers between the two directions easier and more convenient—something that becomes more important as a BRT network expands. It also tends to reduce construction costs and minimize the necessary right-of-way. In some cases, stations may be centrally aligned but split into two—called split stations, with each station housing a particular direction of the BRT corridor.

Bilateral stations (those that are curb-aligned while in the central verge) get no points.

The BRT system in Hubli-Dharwad, India, has center stations that serve both directions and uses sliding doors that are half height to protect passengers while allowing the station to be open for air circulation. **CREDIT:** Hubli-Dharwad

Scoring Guidelines: the corridor may receive a point for center stations by meeting either of the criteria below.

Center Stations	Points
> 80% of stations on corridor have center platforms serving both directions of service	2
> 50% of stations on corridor have center platforms serving both directions of service	1
> 80% and above of stations on corridor have center platforms serving only one direction of service	1

PAVEMENT QUALITY

2 points maximum

Good-quality pavement ensures better service and operations for longer by minimizing the need for busway maintenance. Roadways with poor-quality pavement will need to be closed more frequently for repairs. Damaged pavement results in very bumpy rides for passengers and buses driving more slowly. A smooth ride is critical for creating a high-quality service that attracts and retains customers.

No matter what type of pavement, a thirty-year life span is recommended. There are several options for the pavement structure to achieve that span, with advantages and disadvantages for each. Three examples are described here:

- **Asphalt:** Properly designed and constructed, asphalt pavement can last thirty-plus years with surface replacement every ten to fifteen years. This can be done without interrupting service, resulting in a smooth, quiet ride. At stations and intersections, rigid pavement bus pads are important to use to resist the potential pavement damage due to vehicle braking, a problem most acute in hot climates. Bus pads are constructed using cement concrete over a layer of aggregate, with dowels and/or varying amounts of reinforcing steel, depending on design conditions. Each bus pad should be 1.5 times as long as the total length of buses using it at any time;
- **Jointed Reinforced Concrete Pavement:** This type of pavement design can last thirty-plus years. To ensure this lifespan, the pavement must have round dowel bars at the transverse joints, tie bars in the lane along longitudinal joints by the use of reinforcing steel, and adequate thickness;

Reinforced concrete pavement under construction in Lima, Perú.
CREDIT:
Gerhard Menckhoff

- **Continuously Reinforced Concrete Pavement:** Continuous slab reinforcement can add additional pavement strength and might be considered under certain design conditions.

For the concrete options, it is important to note that the concrete pavement should run to at least the stopping area at the station sections and up to the stop lines at intersections; if not, due to the pressure from braking, rutting and deformation will occur that will impact the intersection or station stop.

Pavement Materials	Points
Pavement structure designed for thirty-year life over entire corridor	2
Pavement structure designed for thirty-year life only at stations and intersections	1
Pavement design life less than thirty years	0

DISTANCE BETWEEN STATIONS

2 points maximum

In a consistently built-up area, the optimal distance between station stops for a rapid transit system averages around 450 meters (1,476 feet). Beyond this distance, the additional walking time is greater than the time saved by higher average bus speeds due to less frequent stops. Below this distance, the additional travel time from slower average bus speeds due to more frequent stops outweighs the time saved from shorter walking distances. Thus, to achieve a reasonably optimal station spacing, the average distance between stations should be 0.3 kilometers (0.2 miles) to 0.8 kilometers (0.5 miles).

An aerial perspective of phase 1 of the Dar es Salaam BRT system shows consistently and appropriately spaced stations. **CREDIT:** ITDP

Scoring Guidelines: Two points should be awarded if stations are spaced, on average, between 0.3 kilometers (0.2 miles) and 0.8 kilometers (0.5 miles) apart, as measured from the station entrance. If there are multiple entrances, use the center of the station.

Station spacing is not applicable in areas that are not built-up (like large parks, bridges, or natural areas) and can be excluded from calculating the average station spacing.

Distance Between Stations	Points
Stations are spaced, on average, between 0.3 kilometers (0.2 miles) and 0.8 kilometers (0.5 miles) apart	2

CUSTOMER-FRIENDLY STATIONS

3 points maximum

Stations with passenger amenities make a BRT system attractive and comfortable to a wide range of customers. The key elements of customer-friendly stations:

- **Ample space.** Stations should be wide enough for passengers to move easily and stand without feeling overcrowded. Overcrowded stations are more likely to encourage pickpocketing, harassment, and virus transmission. Stations should have a minimum internal width of at least 3 meters (10 feet) and wider widths at stations with higher passenger volumes.

- **Attractive.** Attractive stations are important to the image of the BRT corridor. They create a sense of permanence and attractiveness that will attract riders, residents, and businesses. Stations should use high-quality materials, artworks, local designs, and other aesthetic features to contribute to civic and community pride.

- **Boarding indicators.** To improve boarding and alighting times and ensure customer fairness in platform queuing, stations should use boarding indicators. These effective, low-cost tools include arrows or other markings on the platform.

- **Fire-fighting equipment and emergency medical kit.** Stations should be equipped with basic fire-fighting equipment. While the preference is to have a ceiling sprinkler system, the minimum for this element is to have fire extinguishers and an emergency medical kit at each station.

BOTH PAGES: Ample stations in Cape Town, South Africa, with fire equipment and clear signage to service persons with disabilities, caregivers and cyclists.
CREDIT: ITDP

- **Hand sanitizers.** Stations should provide hand sanitizer dispensers at the station entrance and at the platform area to help to reduce disease transmission in public spaces.

- **Seating.** Stations should include benches or other forms of seating to ease the physical burden of waiting, especially for older passengers, caregivers traveling with young children, pregnant people, etc.

- **Staff restrooms.** Within the general station environment, restroom facilities should be provided for station staff. This can include arrangements with nearby shops or establishments for staff. For example, if there is a public restroom nearby, this may qualify as a staff restroom.

- **Water fountain.** Stations should include water fountains, as access to clean drinking water is a key customer amenity, especially in locations with warm climates.

- **Weather-protected kiosk queues.** Station ticket kiosks should provide weather protection for waiting customers, with a covered queue length of at least 5 meters (16 feet) to qualify for this element.

- **Weather-protected platforms with passive solar design.** Station platforms should be weather-protected, including wind, rain, snow, heat, and/or cold, as appropriate to the conditions in a specific location. Effective and low-cost passive solar design can improve customer comfort and contribute to lowering the heat-island effect of the city. Reflective coatings on station roofs are an effective measure for reducing peak summer temperatures on the platform. Likewise, the extension of the station roof overhang reduces the incidence of direct sun and rain in the passenger area. An overhang length of at least 700 mm (28 inches) is recommended as a passive measure.

- **Wi-Fi.** To make the public transport system more attractive to business commuters, students, and others, stations should provide Wi-Fi to customers on platforms and in vehicles.

- **Family-friendly station design.** Stations should have bright colors and play elements at the height of toddlers, as interactive spaces allow children to travel more easily with caregivers. Stations should also include baby changing stations and priority seating for families with young children to qualify for this element.

Scoring Guidelines: The scoring is determined by multiplying the percentage of the stations with each number of elements by the points associated with that number of elements. A maximum of 3 points is possible.

Customer-friendly Stations	Points	Weighted By
Stations have at least 8 of the listed elements	3	% of stations on corridor
Stations have at least 6 of the listed elements	2	
Stations have at least 4 of the listed elements	1	

GREENING MEASURES AND RESILIENCY

1 point maximum

Ensuring that the BRT system operates effectively during emergencies and in extreme weather events is increasingly important as these become more common. The system's design should consider climate resilience measures to reduce the ecological footprint and on-going operating costs. These measures should apply to both stations and depots, even though this metric only asks to assess stations.

Recommended greening, disaster risk reduction, and climate resilience measures are:

- **Bioswales.** Bioswales are vegetated ground areas that absorb and detain water, preventing stormwater from overwhelming the municipal drainage system and/or flooding sensitive areas. They can also improve the appearance of stations and BRT corridors. They can be installed as busway delineator fencing, at station verges, or connector links between each platform.

- **Lane strips.** A lane strip is a bioswale area in the median of the dedicated BRT lane that absorbs rainwater to mitigate overwhelming the stormwater system along the corridor. Lane strips also carry other substantial benefits, including noise reduction (the vegetative strip absorbs the noise from the BRT vehicles), improvement in lane enforcement from private vehicles, and reduced material usage.

A BRT station in Guadalajara, Mexico, is beautified with plants in the form of a bioswale, which helps clean the air near where passengers wait and also works for stormwater drainage.
CREDIT: Jalisco State Government

- **Shade trees and canopies.** Planting and preserving trees along the corridor reduce the urban heat-island effect. Shade trees also provide weather protection for pedestrians. If space permits, tree planting can be done either in the busway median or along the roadway edge. Tree plantings can also form an important safety buffer between motorized traffic and pedestrians/cyclists. Green canopies for pedestrian paths and over the busway are also an effective and attractive option. Trees also help slow down and temporarily store stormwater runoff, which is becoming more important due to extreme rain events.

- **Uninterruptible Power Supply (UPS) with efficient battery technology.** When the local electricity supply fails, it is important that the BRT can continue to operate. Backup power for station functions (lighting, fare turnstiles and gates, power screen doors, etc.) is critical. At least 90 minutes of backup power supply should be provided to qualify for this element. UPS systems using lithium-ion batteries or other clean technologies are preferred over diesel generators.

- **Air quality monitoring.** To heighten awareness of BRT's contribution to cleaner air quality, stations should display the ambient air quality.

- **Energy-efficient lighting.** Stations and surrounding streets should be fitted with energy-efficient lighting technology, such as LEDs or compact fluorescents, to reduce system energy costs. Better street lighting creates a safer pedestrian and busway environment.

- **Gray water recycling.** Water should be collected from station rooftops or recycled from bus washers at depots and utilized for gray water applications, such as landscaping and sanitation water.

- **Recycling bins.** Stations should provide recycling bins to support better waste management and raise the public's recycling awareness.

- **Renewable energy technologies.** Renewable energy technologies, such as solar photovoltaic panels and wind turbines, should be used to help meet the station and depot electricity demands. For systems using electric vehicles, renewables can ensure a truly zero-emission system.

Scoring Guidelines: The scoring is determined by multiplying the percentage of the corridor/stations/ depots with each quantity of elements by the points associated with that number of elements. A maximum of 1 point is possible.

Greening Measures and Resiliency	Points	Weighted By
Stations have at least 4 of the listed elements	1	% of stations on corridor

Medellín, Colombia, has committed to creating eco-stations, with the concept of waiting for the BRT in a park. This includes a modular design inspired by trees that also retain and integrate existing trees into the station by greening the median and using design to cool and clean the spaces.
CREDIT: ARQUIURBANO Taller

NUMBER OF DOORS ON BUS

2 points maximum

The speed of boarding and alighting is partially a function of the number of bus doors. Just as a metro car has multiple wide doors to let higher volumes of people on and off quickly, buses also need multiple wide doors. Single doors or narrow doorways create bottlenecks that delay the bus.

Scoring Guidelines: Buses need to have a sufficient number of doors on the station side of the bus. This is defined as three or more doors for articulated buses or two wide (at least 1 meter wide) doors for regular (non-articulated) buses. Buses less than 9 meters long are only required to have one large door. For buses where more than one door is required, doors must be spaced at least 2 meters apart, and boarding must be permitted via all doors to receive points. Points are weighted based on the percentage of buses using the corridor infrastructure, with a maximum score of 2.

This BRT bus in the Mi Macro Periférico system in Guadalajara, Mexico has two wide doors in the middle and one at the front that allows people to quickly exit or board with level boarding.
CREDIT: Jalisco State Government

Bus Type and Length	Minimum Number of Doors on Station Side of Bus	Points	Weighted By
9 meters or less (non-articulated)	1	2	% of buses using corridor infrastructure meeting criteria
> 9 meters (non-articulated)	2	2	
Articulated	3	2	
Bi-articulated	4	2	

Example:
A) 20% of buses are 9m buses with 1 door
B) 30% are 12m buses with 1 door
C) 40% are 18m articulated buses with 3 doors
D) 10% are 18m articulated buses with 2 doors
TOTAL = (20% x 2) + (30% x 0) + (40% x 2) + (10% x 0) = **1.2 points**

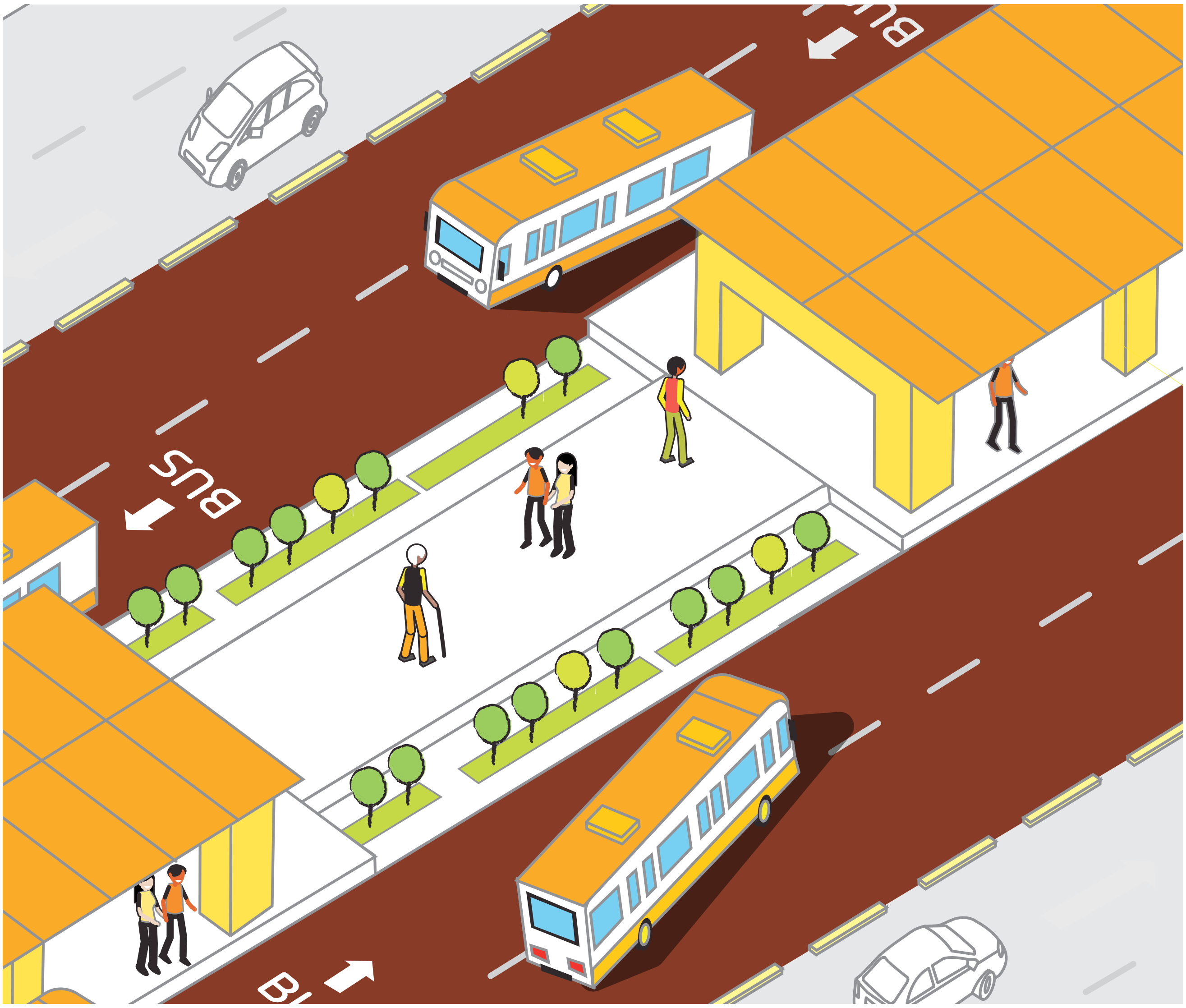
INDEPENDENT DOCKING

2 points maximum

Independent bus docking not only increases the capacity of a station, saving users time, but it also helps stations provide multiple services. This is achieved by having substops with sufficient space between them to allow buses to pull up to different substops and not get stuck behind a docked bus.

A station may be composed of multiple substops that can connect but should be separated by a walkway long enough to allow buses to pass one substop to dock at another––at least 1.7 times the length of the bus but can be up to 2 times the bus length to allow for easier docking by drivers. This reduces the risk of congestion by allowing a bus to pass a full substop to an empty one where buses can let passengers on and off. Substops are usually adjacent and allow a second bus to pull up behind a bus already at the station. A station may be composed of only one substop.

Illustration of a station with independent docking composed of two substops separated by walkway and passing lanes.



The ultimate goal is to prevent congestion at the station, as measured by station saturation (see 7.3 of the BRT Planning Guide). Poorly designed stations can lead to peak-hour vehicle queues, particularly at high-demand stations. The proper design of a station to prevent congestion is directly related to the concept of saturation level. For BRT stations, 40 percent saturation is the maximum accepted for planning purposes, allowing a reasonable safety margin for uncertainties in the planning process, like the number of transfers or the real number of passengers boarding and alighting. While saturation is a factor of frequency and dwell time, for the purpose of the scorecard, we use overall bus frequency as a proxy for a corridor's station that may experience high saturation and require substops.

Scoring Guidelines: If bus frequency is less than 20 buses an hour, no independent docking is needed, and the corridor is awarded full points.

Independent Docking		Points
< 20 buses an hour	No requirement	2
> 20 buses an hour	At least two substops at the highest-demand stations	2
	Less than two substops at the highest-demand stations	0

SLIDING DOORS IN BRT STATIONS

1 point maximum

Sliding station doors, where passengers get on and off the buses, improve the quality of the station environment, reduce the risk of crashes and injuries, protect passengers from the weather, and prevent pedestrians from entering the station in unauthorized locations.

Passengers wait behind a sliding glass door for the bus to arrive in the Rainbow system of Pune / Pimpri Chinchwad, India.
CREDIT: ITDP

Sliding Doors	Points
All stations have sliding doors	1
Otherwise	0

COMMUNICATIONS

Zu Peshawar BRT network keeps clear branding and simplified maps available of the routes in its stations.
CREDIT: Asian Development Bank (ADB)

BRANDING

2 points maximum

BRT promises a high-quality service, which is reinforced by a unique brand and identity.

A brand is the manifestation of the mission, vision, and values of the transit system and agency, as shown in the appearance and feel of the system––the logo, bus, uniforms, website, social media, advertisements, and the bus and stations. A strong, cohesive brand identifies the system, sets expectations for service, and attracts and retains riders, which leads to higher revenues.

Branding	Points
All buses, routes, and stations in corridor follow single unifying brand of the entire BRT system	2
All buses, routes, and stations in corridor follow single unifying brand, but differ from the rest of BRT system	1
No corridor brand	0

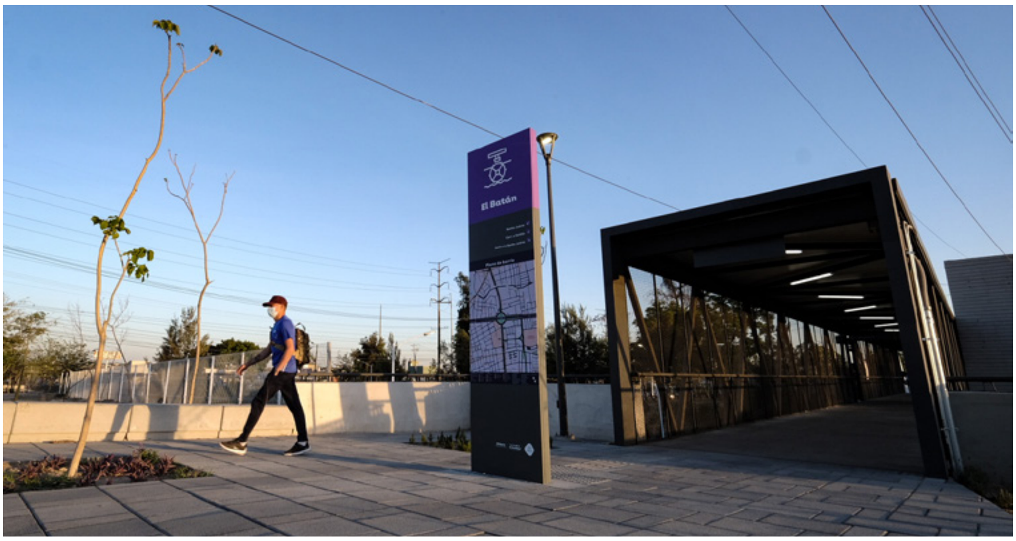
Johannesburg, South Africa's BRT system has a strong brand, starting with its name – Rea Vaya – which means "we are going". The logo is placed on the stations, buses, and other assets of the system. It has a clear color scheme, and the stations are included as key iconography of the system, linking it with the local community. **CREDIT:** ITDP

PASSENGER INFORMATION

4 points maximum

Numerous studies show that customer satisfaction improves significantly when they know when the next bus will arrive and get real-time updates on the events that might impact their trip. Frequent, timely, and relevant communication with users (including two-way communications between the system and the users) is critical to high-quality service, adds the capacity to adapt and react to potentially disruptive events, and ensures an overall positive experience.

Passenger information in Yichang BRT stations display real time information on how many stops the next bus is from the station.
CREDIT: ITDP



Outside the station in Guadalajara, Mexico, a totem with the name and icon of the station help people identify the station as they arrive, while maps help passengers navigate once leaving.
CREDIT: Jalisco State Government

Real-time passenger information, based on GPS data, includes electronic panels, digital audio messaging (“Next bus” at stations, “Next stop” on buses), and/or dynamic information on handheld devices. Static passenger information refers to the station and vehicle signage, including network maps, route maps, local area maps, emergency indications, and other user information. To qualify, passenger information should be visible from buses, stations, and nearby sidewalks. Poor or confusing signage and passenger information can create cognitive barriers to access for people with disabilities.

In addition, more customers are accessing information via smartphones and mobile applications, including route maps, arrival times/schedules, and service alerts. To facilitate trip planning, systems must provide public real-time General Transit Feed Specification (GTFS) data when possible. This global standard provides passengers with more accurate information and enables seamless integration with 3rd-party trip planning applications.

Websites, apps, and social media are other means for sharing BRT services. This is increasingly important for conveying information to customers, receiving feedback, and addressing problems, especially using social media to engage with customers.

Richmond’s Pulse BRT provides riders with the station area map and a QR option to give passengers real-time information on bus progress at each station. **CREDIT:** ITDP

Scoring Guidelines:
Scores are awarded for systems with the following elements:

1. Online trip planning
   a. Up-to-date and reliable GTFS data publicly available online (directly or through third-party apps) and
   b. Online trip planning apps (proprietary or third-party) use GTFS data
2. Online customer engagement
   a. Dynamic website with system map and
   b. Active social media to communicate with and receive information from passengers
3. Clear, functional, and up-to-date information at stations
   a. Clear signage at stations, including station name, routes, maps (local area maps, system maps), fare information, frequency, or schedule of service and
   b. Real-time travel announcements and route information
4. Clear, functional, and up-to-date information on board vehicles
   a. Clear announcements of stops (visual and audible) and
   b. System maps, including signage for the visually impaired and
   c. Route strip maps

To score a point for an element, a corridor must meet all the criteria listed above.

Passenger Information	Points
All four elements above	4
Three elements above	3
Two elements above	2
One element above	1

PASSENGER COMMUNICATION AND DATA COLLECTION

2 points maximum

BRT systems need to understand their passengers' needs for safe, comfortable, and effective transportation, as well as ensure that the system meets the needs of all people, especially the most vulnerable or marginalized. This can be achieved by hearing directly from passengers, establishing ways to communicate with the system, and using surveys and focus groups to collect more data. Collecting disaggregated data from user survey mechanisms allows the planners to understand who is using the system and how. Collecting feedback from passengers allows the planners to understand what is working and what is not to correct problems in the short term. Having mechanisms to communicate to passengers allows a system to notify of changes or disruptions in service. Two-way communication mechanisms can also allow a system to create conversations with its community and its passengers. This can include electronic text boards, public announcement systems, and push alerts to mobile or smartphones (i.e., text alerts, AMBER alerts, app-based alerts).

The ReaVaya BRT's social media account communicating with passengers about potential service disruptions.
CREDIT:
Rea Vaya via Twitter

Two main forms of passenger communication and data collection are recommended:

1. Real-time feedback mechanisms
   - **a.** In-station or in-bus survey mechanisms (such as “How was your trip?” quick response formats)
   - **b.** Online nudges and push notifications soliciting feedback about the trip
   - **c.** Social media, SMS, or phone numbers where passengers can report problems
2. Annual user perception surveys
   - **a.** In-person interviews
   - **b.** Mailed, emailed, or online surveys
   - **c.** Focus group workshops

Surveys should include:

- Affordability of fare
- Security in vehicles, as well as in and accessing stations
- Traffic safety in vehicle and accessing stations
- Comfort (crowding, temperature, etc.)
- Satisfaction with service (frequency, reliability, coverage)
- Satisfaction with cleanliness and upkeep of the buses and stations
- Satisfaction with information available and communication from the system

Focus groups offer a way to get feedback from groups that may be hard to reach online or even in person and elevate the needs of a particular group that may be underrepresented or ignored in planning.

User surveys should make sure to include data disaggregated for:

- Gender
- Disability
- Income
- Race/ethnicity/other categories (as appropriate)
- Age

The Rainbow BRT system encourages passengers to connect to Facebook with signs in its stations in Pune / Pimpri-Chinchwad, India. **CREDIT:** ITDP

Scoring Guidelines: Each form gets one point for a total of 2 points maximum.

User Perception / Opinion	Points
Has at least one real-time mechanism for customer feedback: • In-station or in-bus survey mechanisms • Online nudges and push notifications soliciting feedback about the trip • Social media, SMS, or phone numbers where passengers can report problems	1
Does user outreach and survey at least once a year with data disaggregation • In-person interviews • Mailed, emailed, or online surveys • Focus group workshops	1

ACCESS AND INTEGRATION

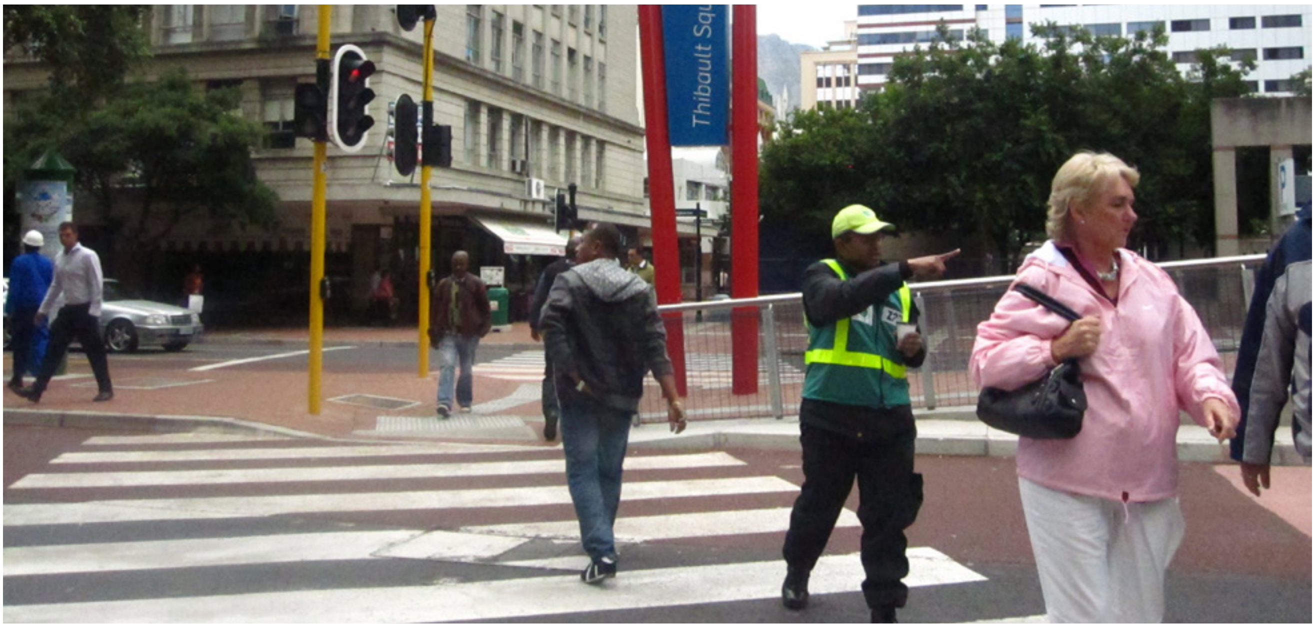
Universal access means that all people can use the system, including people with disabilities or older people who may have mobility constraints. Salvador, Brazil.
CREDIT: Gabrielle Guido

UNIVERSAL ACCESS

3 points maximum

A BRT corridor should be accessible to all customers and staff, including those who are physically, visually, and/or hearing impaired, as well as those with temporary disabilities, older people, younger children, caregivers, and any load-carrying passengers. This design approach aims to eliminate any physical, cognitive, sensory, or social barriers. Some of these barriers, such as cognitive and social barriers (confusing signage, overcrowding, poor lighting), are accounted for in other scoring elements. Universally accessible design is also referred to as "barrier free," "universal design," "design for all," and "inclusive design."

For caregivers and families, universal accessibility makes it easier to use the BRT system while traveling with babies, toddlers, and goods. Universal accessibility is important to maintaining a high quality of service for all customers and an accessible working environment for staff, regardless of their abilities.



Universal access starts with arriving at the station. Cape Town ensures that there is high contrast and tactile wayfinding to guide people to the station. This continues inside the station with tactile ground surface indicators, level boarding, markings on doors so people know where to board, as well as other audio-visual options. Finally, inside the bus, space for wheelchairs and strollers and priority seating continues the universal access journey.
CREDIT: ITDP

Scoring Guidelines: For this scoring element, we examine two criteria: 1) physical and 2) audiovisual. Physical accessibility means that all stations, vehicles, and fare gates on the corridor are universally accessible for people using wheelchairs to navigate independently, and stations are free of obstacles that impede movement. The corridor must also include curb ramps from the crosswalk to the sidewalk at all immediate intersections. There must also be designated in-vehicle space for people who use wheelchairs, and systems must allow customers to carry large packages and goods or items, including strollers or carriers for babies/toddlers.

Audiovisual accessibility means that there are braille readers at all stations, Tactile Ground Surface Indicators leading to all stations, and sufficient lighting to facilitate those with poor vision. Scores are determined by measuring the percentage of stations and buses that provide each level of access by the points associated with that level and tallying the result.

To receive the maximum points, all stations must have staff available to assist customers who need additional help.

A maximum of 3 points is possible.

Universal Accessibility at Stations	Points
Full accessibility, including support staff, provided	3
Physical accessibility provided	2
Audiovisual accessibility provided	1

INTEGRATION WITH OTHER PUBLIC TRANSPORT

2 points maximum

When a BRT corridor is built in a city, a functioning public transport network––rail, bus, bikeshare, minibus, informal transport, or rickshaws––often already exists. The BRT corridor should integrate with the rest of the public transport network, saving customers time and creating a more seamless, high-quality experience. Better integration makes it easier for passengers to access more of the city. Often, caregivers have multiple destinations during one trip. Integration helps the caregiver make these more complicated trips to destinations they may not go to regularly, unlike a commuter. Integration recognizes and responds to the fact that people make complicated trips.

Shared, for-hire modes, like taxis, motorcycle taxis, and app-based ride-hailing services, also need to be integrated as part of the system, but for the Standard, we only measure public transport modes.

Jakarta has been working to integrate its BRT system with the other systems in the city. First, the city has been physically integrating its MRT, BRT, and commuting rail at stations with excellent wayfinding to help people transfer, as shown at the Tanah Abang Station. Second, Jakarta introduced JakLingo, a fare integration scheme that allows users to use the same card on both BRT and microtrans buses. **CREDIT:** ITDP

There are three main components to integration:

- **Physical transfer points:** Physical transfer points should minimize walking between modes, be large enough to accommodate the volumes of passengers transferring, have clear wayfinding between different modes, and provide space for informal public transport modes to stop safely. Ideally, physical integration does not require passengers to exit one system completely to enter another.

- **Fare payment:** The fare system should be integrated so that one fare card may be used for all modes and allows for trip chaining and sufficient time for transfers, especially for first-and last-mile connections.

- **Information integration:** For a BRT service to be most effective, a person needs to be able to plan trips across BRT and other modes and services. Integrated system information should communicate all public transport services available, including service times and locations, to enable effective trip planning across modes and services.

Scoring Guidelines: The BRT corridor should integrate all three components, with a point allocated each.

Integration with Other Public Transport	Points
Integration of all 3 components (physical, fare, and information)	2
Integration of 2 components	1
No integration	0

PEDESTRIAN ACCESS AND SAFETY

4 points maximum

A BRT corridor could be extremely well-designed, but it will be much less useful if customers cannot access it safely. Good pedestrian access is imperative for creating high-level BRT service for users and improves the safety and comfort of everyone in the area. A new BRT corridor is a good opportunity to improve the pedestrian environment on the streets and public spaces along the corridor and side streets leading to stations.

Scoring Guidelines:
Good, safe pedestrian access along the corridor includes:

- At-grade pedestrian crossings where pedestrians cross a maximum of two lanes of traffic before reaching a physically protected pedestrian refuge (e.g., sidewalk, median). Pedestrian bridges or underpasses with working escalators or elevators are strongly discouraged and should only be considered in extreme circumstances, such as on limited access highways;
- In built-up areas, the corridor has safe pedestrian at-grade crossings at least every 200 meters;
- Signalized crosswalks where pedestrians must cross more than two lanes at once;
- Table-top crossings or speed bumps to slow down traffic when approaching unsignalized crosswalks;
- Signals timed so that pedestrian waiting time is not excessive (i.e., generally below 30–45 seconds, see Long Signal Cycles deduction);

Pedestrians have a wide and clearly marked crossing to the station in Belo Horizonte, Brazil. **CREDIT:** ITDP

- Wide (at least 2 meters), well-lit, well-demarcated crosswalks where the footpath remains level and continuous, or ramps exist to ensure accessible crossings;
- Dedicated and protected sidewalks along the corridor that are at least 3 meters (10 feet) wide and unobstructed, including from encroachment from parked vehicles, debris, signs, and street vendors;
- Direct station access, with no time-consuming detours and other delays;
- Posted speed limits set to prioritize safety (e.g., below 30 kilometers per hour in dense urban centers);
- Design that matches posted speed limits to prevent speeding and help with enforcement.

Calculate by multiplying the percentage of the elements to the points that they qualify for based on their coverage across the corridor, and then add those together to get the final number.

Pedestrian Access and Safety	Points
% of elements along > 90% of the corridor	4
% of elements along 80-90% of the corridor	3
% of elements along 70-80% of the corridor	2
% of elements along 60-70% of the corridor	1
< 60% of the corridor has good, safe pedestrian access	0

Example:
A) 8 out of 10 elements (80%) are found over 90% of the corridor
B) 2 out of 10 elements (20%) are found along 75% of the corridor
TOTAL = (80% * 4) + (20% * 2) = **3.6 points**

SECURE BICYCLE PARKING

1 point maximum

Bicycle parking at stations allows customers to use bicycles to access the BRT system, increasing system coverage, saving users time, and creating a higher quality experience. Bicycles can act as a more cost-effective feeder than buses to the BRT corridor for distances too long to walk. To attract more bicyclists, secure bicycle parking facilities should be monitored by an attendant or observed by security cameras and be weather protected. Bicycle parking can also allow for other small devices, such as stand-up scooters, to be parked there as well.

Protected and secure bike parking is integrated in the main terminals of Bogotá, Colombia, and is included in the fare.
CREDIT: TransMilenio SA

Scoring Guidelines: Secure, low-cost bicycle parking may look different in different locations, and this context should be considered when determining the score.

Bicycle Parking	Points
Secure bicycle parking that is free or low-cost at higher-demand stations as a minimum, and standard bicycle racks elsewhere	1
Little or no bicycle parking	0

BICYCLE LANES

2 points maximum

Bicycle networks integrated with the BRT corridor improve customer access, provide a full set of sustainable travel options, and enhance road safety. This can save time and improve the quality of the experience for users on the corridor.

Physically protected bicycle lanes and streets with low vehicle speeds and volumes should ideally connect BRT stations to all major residential areas, commercial centers, schools, and business centers within 2 kilometers (1.2 miles). This helps the BRT by providing a low-cost feeder to the system and connecting riders safely and comfortably to their destinations. Also, by ensuring that the BRT corridor is designed as a complete street, it increases the safety of all users of the corridor.

In most cities, the best BRT corridors are also the most desirable bicycle routes, as they have the greatest travel demand. Yet, these same corridors often lack safe cycling infrastructure, tempting people to cycle on the busway, a serious safety risk.

A protected cycle lane that became permanent after the COVID pandemic runs parallel to the Metrobús Línea 1 in Mexico City, gives more commute options and takes some of the stress off from the well-used corridor. **CREDIT:** ITDP

Scoring Guidelines: Bicycle lanes should be built either within the same corridor or on a nearby parallel street and should be at least 2 meters (6.5 feet), for each direction, of unimpeded width. Bicycle lanes must include a physical barrier between bicycles and motor vehicles that prevents car traffic from entering.

Bicycle streets are streets with low vehicle speeds (< 30 kilometers per hour /< 20 miles per hour), low vehicle volumes (< 1,500 vehicles per day), and prioritized bicycle movement.

Bicycle Lanes	Points
Bicycle lanes and/or bicycle streets form a network along and connecting to the corridor	2
Bicycle lanes and/or bicycle streets are parallel to the entire corridor	1
Poorly designed or no bicycle infrastructure	0

BIKESHARE INTEGRATION

1 point maximum

The option to make short trips from the BRT corridor by bikeshare can save users time and improve access to many destinations. The operating costs of last-mile bus service (i.e., feeder buses) are often the biggest expense for BRT operations, so a lower-cost bikeshare alternative to feeders often makes financial sense.

Bikeshare stations are adjacent to BRT stations in Mexico City, Mexico, helping passengers connect to their final destinations. **CREDIT:** ITDP

Bikeshare Integration	Points
Bikeshare at minimum of 50% of stations on corridor	1
Bikeshare at < 50% of stations on corridor	0

PERSONAL SECURITY AND GENDER-BASED VIOLENCE

3 points maximum

A lack of personal security is one of the biggest deterrents for women and other marginalized people using public transport, impacting when or if they use it at all. Improved security, however, helps keep all passengers safe. To achieve this, conflict resolution, de-escalation, and a public safety approach to prevent assaults, harassment, robbery, and violence at stations and on buses is encouraged. Unfortunately, public transport systems have historically been a site of over-policing and violence against marginalized and discriminated communities. Recommended approaches include providing frequent service and good communication of route schedules—features that are addressed in other scoring elements. Other approaches include better design, deterrents, mechanisms for reporting and responding to crime and aggression, and educational campaigns to change the cultural attitudes that permit assaults/harassment.

TransPeshawar conducted gender audits and focus groups to guide their Gender Action Plan (GAP) that informed inclusive solutions when designing the corridor. The system now includes lower bus handholds, CCTV on buses and in stations, and women-only spaces. They also have trainings for staff and social campaigns to raise awareness about harassment. **CREDIT:** @ADB_HQ/ Twitter

The following elements support safer and more secure systems. There are three main areas in which elements will be assessed for points:

Access to the station:

- Good lighting (at least 200 lumens)
- Clear sightlines into the station

Within the station and vehicle:

- Visually porous areas; clear sightlines out of the station
- Transparent panes
- Illumination at night
- CCTV security cameras at stations
- CCTV security cameras on buses
- Safety mechanisms and protocols to report incidents (such as panic buttons, emergency phone, apps, SMS services)
- Attendants and public safety personnel (especially in the evenings): having female staff may make it easier for women passengers to report issues

Gender, sexual harassment, and conflict resolution training, education, and data:

- Training for all staff (attendants, drivers, security personnel) on how to prevent violence and how to respond to reports of violence
- Public education campaigns

Personal Security and Gender-based Violence	Points
System utilizes at least 9 of the listed elements	3
System utilizes at 7 of listed elements	2
System utilizes at 5 of listed elements	1

OPERATIONAL DEDUCTIONS

BRT 7 de Setembro in Curitiba, Brazil.
CREDIT: Pedro Bastos

Point deductions are assessed for corridors already in operation. Proper maintenance and quality operations are critical to attracting and retaining riders. They are as important as the design, but easier to change and improve. These metrics are designed to discourage significant planning, management, or operational errors that are not readily observable during the design phase.

The penalties are as follows:

POORLY MAINTAINED INFRASTRUCTURE

-14 points maximum

Even a BRT corridor that is well built and attractive can fall into disrepair. It is important that the busway, buses, stations, and technology systems must be regularly maintained and operated by the public transport agency or service provider. A corridor can be penalized for each type of poor maintenance listed below for a total of -14 points.

Maintenance of Busway	Points
Busway has significant wear, including potholes or warping, or debris such as trash or snow	-4

Maintenance of Buses	Points
Buses have graffiti, litter, seats in disrepair, and/or bus mechanisms (e.g. doors) that do not afunction properly	-2

Maintenance of Stations	Points
Stations have graffiti, litter, occupancy by unhoused people, vagrants, or vendors; structural damage; and/or sliding doors that do not work	-2

Maintenance of Technology Systems	Points
Technology systems, including fare collection machines, are not functional, up-to-date, or accurate	-2

Maintenance of Sidewalks on Corridor	Points
Sidewalks in disrepair (broken or uneven pavement, obstructions, etc.)	-2

Maintenance of Bicycle Lanes on Corridor	Points
Bicycle lanes in disrepair (potholes, obstructions, etc.)	-2

OVERCROWDING

-10 points maximum

This deduction was included because many otherwise well-designed corridors have become so overcrowded that they are alienating to customers and more conducive to sexual harassment and assault. Crowding can also pose cognitive and social barriers to access for people with disabilities. For caregivers traveling with young children or with strollers, overcrowding is a significant barrier. While the average "passenger standing density" is a reasonable indicator, getting this information is not easy, so a more subjective measure is allowed in cases of obvious overcrowding.

Scoring Guidelines: This penalty should be assessed at one of the highest-demand stations on the BRT corridor.

The full penalty should be imposed if the average passenger standing density during the peak hour at stations or on vehicles is greater than seven passengers per square meter (0.46 per square foot). As this metric is not easily calculated, observers may use clearly visible signs of overcrowding, as indicated in the scoring matrix.

Overcrowding	Observable Indication	Points
Passenger density in a station or buses during the peak hour is > 7 passengers/m^2	Passengers are unable to move in vehicles or stations OR Passengers are unable to board buses or enter stations	-10
Passenger density in a station or buses during the peak hour is > 6 passengers/m^2	Passengers are pressed close to other passengers on all sides and have difficulty moving	-6
Passenger density in a station or buses during the peak hour is > 5 passengers/m^2	Passengers are in close physical contact with other passengers on all sides but can still move	-3
Passenger density in a station or buses during the peak hour is > 4 passengers/m^2	Passengers are in close contact with some touching of other passengers on all sides	-1

LOW COMMERCIAL SPEEDS

-10 points maximum

The features in the scoring system nearly always result in higher speeds but can be undermined by poor design or operations. In such cases, bus speeds could be lower than in mixed-traffic conditions, and the corridors would receive this deduction.

Scoring Guidelines: The average commercial speed refers to the corridor-wide average speed, not the average speed at the slowest link. Many transit agencies/operators will measure this internally, and this data may be used if it includes peak-hour service for non-express routes operating entirely along the corridor. If this data is not available, measure commercial speeds along a corridor by riding the longest, non-express route on the corridor in the peak hour in the peak direction, then divide the total distance traveled along the corridor by the total time to travel the corridor. For bus routes that extend beyond the BRT infrastructure, only measure the bus speeds for the portion of the route on the BRT corridor to obtain the average commercial speed.

Commercial Speed Calculation

A) Commercial Speed (kmph or mph)
B) The total distance traveled along the corridor (expressed in kilometers or miles)
C) Time to travel longest, non-express route on the corridor in the peak hour in the peak direction (expressed as hours)

A = B / C

Average Commercial Speeds	Points
> 20 kmph (12.4 mph)	0
19-20 kmph (11.8–12.4 mph)	-1
18-19 kmph (11.2–11.8 mph)	-2
17-18 kmph (10.5–11.2 mph)	-3
16-17 kmph (10–10.5 mph)	-4
15-16 kmph (9.3–10 mph)	-5
14-15 kmph (8.7–9.3 mph)	-6
13-14 kmph (8.1–8.7 mph)	-7
12-13 kmph (7.5–8.1 mph)	-8
11-12 kmph (6.8–7.5 mph)	-9
< 11 kmph (6.8 mph)	-10

LACK OF ENFORCEMENT OF RIGHT-OF-WAY

-7 points maximum

A BRT corridor may have a good alignment and physical separation, but bus speeds will decline if the right-of-way is not enforced. This deduction addresses corridors that do not adequately enforce the busway to prevent encroachment from other vehicles. There are multiple and somewhat context-specific means of enforcing the exclusive right-of-way for buses. Bus-mounted camera enforcement and regular policing at points of frequent encroachment, coupled with high fines for violators, to minimize invasions of the bus lanes by unauthorized vehicles (e.g., cars and motorcycles) is generally recommended. Solely relying on stationary camera enforcement deployed at high-risk locations is less effective. Emergency vehicles are not considered encroachments.

Scoring Guidelines: Points are deducted based on observed encroachments during peak hours (15-minute observation period) at the location along the corridor where the most encroachment has been observed or predicted. If this is not known, observations may be conducted at one point roughly one-third of the distance from one end and at one point roughly one-third the distance from the other end and then use the one with the most encroachment.

Lack of Enforcement of Right-of-Way	Points
Encroachment on BRT right-of-way by 19 to 21 vehicles (in 15 minutes)	-7
Encroachment on BRT right-of-way by 16 to 18 vehicles (in 15 minutes)	-6
Encroachment on BRT right-of-way by 13 to 15 vehicles (in 15 minutes)	-5
Encroachment on BRT right-of-way by 10 to 12 vehicles (in 15 minutes)	-4
Encroachment on BRT right-of-way by 7 to 9 vehicles (in 15 minutes)	-3
Encroachment on BRT right-of-way by 4 to 6 vehicles (in 15 minutes)	-2
Encroachment on BRT right-of-way by 1 to 3 vehicles (in 15 minutes)	-1
Encroachment on BRT right-of-way by 0 vehicles (in 15 minutes)	0

SIGNIFICANT GAP BETWEEN BUS AND PLATFORM

-7 points maximum

A significant gap between the platform and the bus floor undermines the timesaving benefits of platform-level boarding and introduces a significant safety risk or accessibility barrier for passengers. Such gaps occur for a variety of reasons, from poor basic design to poor driver training. Even corridors designed to accommodate platform-level boarding could experience horizontal gaps if drivers do not dock the buses properly, as well as vertical gaps as the pavement ages, foundations settle, and different buses are used.

Design solutions to minimize these gaps are assessed in the Platform-Level Boarding element. This deduction measures the gaps experienced in actual bus operations and is designed to penalize poor performance in operation beyond the design score assessment.

Scoring Guidelines: The scoring looks at both horizontal and vertical gaps:

- "Horizontal gap" is defined as above 15 centimeters to 24 centimeters
- "Major horizontal gap" is defined as more than 25 centimeters
- "A vertical gap" is defined as greater than 15 centimeters

A sample of at least twenty instances of buses docking at two or more stations should be used to determine scoring. The deduction is based on the percent of the buses with gaps, and the size of gaps. The observations should focus on the gap at the furthest door from the front of the bus, as the gap tends to become larger in the back due to the way drivers pull up to the station. For buses with only one door (typically 9m or less), the one door should be assessed.

Horizontal Gap when Docking	Points
12-24% of the buses have horizontal gaps observed at the back door	-1
More than 25% of the buses have horizontal gaps observed at the back door	-2
12-24% of the buses have major horizontal gaps observed at the back door	-3
More than 25% of the buses have major horizontal gaps observed at the back door	-4

Vertical Gap when Docking	Points
8-16% of the buses have a vertical gap observed at the back door	-1
16-24% of the buses have a vertical gap observed at the back door	-2
More than 25% of the buses have a vertical gap observed at the back door	-3

Total Points= Horizontal Gap + Vertical Gap

LONG SIGNAL CYCLES

-7 points maximum

Long signal cycles can significantly reduce the capacity of BRT corridors by increasing the time spent waiting at red signals, leading to intersection delays that reduce the regularity and frequency of bus service and causes bus bunching. Long signal cycles also make crossing the street challenging for people walking, as they have to wait a long time to be able to cross.

The best measure of intersection delay for BRT is green cycle time (particularly the time between green cycles). The green phase for BRT vehicles in each direction should be at least 40% of the total cycle time, and the total signal cycle length should be less than two minutes.

Scoring Guidelines: Signal Cycles are measured (via 15-minute observations) during the peak hour (2-3 hours with the highest ridership) at two major intersections points along the corridor: one point roughly one-third of the distance from one end and one point roughly one-third the distance from the other end. For both intersections, measure the total cycle length and the percent of the total cycle that is green for BRT and use the matrix below to find the point deduction for each intersection. Apply the greater deduction to the corridor.

		% of Total Signal Cycle That is Green for BRT					
		< 20%	20-25%	25-30%	30-35%	35-40%	> 40%
Total Cycle Length (seconds)	< 30	-1	0	0	0	0	0
	30-60	-2	-1	-1	-1	0	0
	60-90	-3	-3	-3	-2	-2	-1
	90-120	-6	-6	-5	-4	-3	-2
	> 120	-7	-6	-6	-5	-4	-3

Example:
Intersection #1 (⅓ from one end):
cycle time 60 - 90 with 25% green time = -3
Intersection #2 (⅓ from other end):
cycling time > 120 with 40% green time = -4

Apply -4 point deduction (greater of the two) to the corridor.

BUS BUNCHING/RELIABILITY

-6 points maximum

Reliability is one of the key considerations for a person choosing or using public transport, and it is critical to BRT performance. Bus bunching—when the distance between buses is highly uneven—reduces reliability, increases wait times and contributes to crowding conditions that reduce the quality and speed of service.

Scoring Guidelines: This metric measures bus bunching by assessing the variance from regular interval service within three tiers of service frequencies.

Deductions are made when long headways are observed for buses operating in the same direction on the same route (or service). 30-minute observations for this deduction should be made during the peak hour at the highest-demand segment on the corridor.

Based on the frequency of service, the route (or service) will fall into the following categories:

- **High Frequency** (20+ buses per hour)––Regular headways would be 3 minutes or less
- **Medium** (between 10 and 20 buses per hour)––Regular headways would be 3-6 minutes
- **Low** (< 10 buses per hour)
    - Regular headways would be greater than 6 minutes

(Note: to calculate headways, divide 60 by the number of buses per hour. To calculate frequency (i.e., the number of buses per hour), divide 60 by the headway)

Bus Bunching / Reliability	Points
High Frequency (20+ buses/hour)	
Observed bus headways (intervals between two buses) are higher than 12 minutes	-6
Observed bus headways are higher than 10 minutes	-4
Observed bus headways are higher than 8 minutes	-2
Observed bus headways are higher than 6 minutes	-1
Medium Frequency (10 to 20 buses/hour)	
Observed bus headways (intervals between two buses) are higher than 16 minutes	-6
Observed bus headways are higher than 14 minutes	-4
Observed bus headways are higher than 12 minutes	-2
Observed bus headways are higher than 10 minutes	-1
Low Frequency (< 10 buses/hour)	
Observed bus headways (intervals between two buses) are higher than 20 minutes	-6
Observed bus headways are higher than 18 minutes	-4
Observed bus headways are higher than 16 minutes	-2
Observed bus headways are higher than 14 minutes	-1

BUSES RUNNING PARALLEL TO BRT CORRIDOR

-4 points maximum

Bus corridors should be designed to capture as much of the public transportation demand on a corridor as possible, to maximize the utility of dedicated transit infrastructure. A significant number of full-sized public buses operating outside the busway results in difficult transfers and less frequent service on the corridor; this undermines the financial sustainability of the BRT corridor.

Scoring Guidelines: The metric is measured via 15-minute observations at two observation points along the corridor: one point roughly one-third of the distance from one end and one point roughly one-third the distance from the other end.

Buses Running Parallel to BRT Corridor	Points
< 60% of buses operating on corridor use busway	-2
< 30% of buses operating on corridor use busway	-4

LOW PEAK FREQUENCY

-3 points maximum

How often the bus comes during peak travel times such as rush hour is a good proxy for quality of service. For BRT to be truly competitive with alternative modes, like the private automobile, customers need to be confident that their wait times will be short and that the next bus will arrive soon.

Scoring Guidelines: Peak frequency is measured by the number of buses per hour (via 15-minute observations) traveling in the peak direction during the peak hour (2-3 hours with the highest ridership) at two observation points along the corridor: one roughly one-third of the distance from one end, and one point roughly one-third the distance from the other end. If the frequency is below the minimum level at either location, the deduction is assigned. If observations cannot be made, frequencies may be obtained through route schedules.

% of Routes with at Least 8 Buses per Hour	Points
Both observed locations have at least 2 buses per 15 minutes (8 buses per hour)	0
One or more observed locations has less than 2 buses per 15 minutes (8 buses per hour)	-3

LOW OFF-PEAK FREQUENCY

-3 points maximum

As with peak frequency, how often the bus comes during off-peak travel times is a good proxy for quality of service. Off-peak is often not well served by public transport in terms of frequency and that bars many people from being able to access the city for appointments, education, and trips other than the commute trip. Maintaining a relatively frequent service during off-peak hours ensures that caregivers, older and younger people, and people working outside the traditional commute time frame can reach their critical destinations.

Scoring Guidelines: Off-peak frequency is measured by the number of buses per hour observed (via 15-minute observations) traveling one-way during an off-peak hour (daytime hours outside of the 2-3 hours with the highest ridership) at two observation points along the corridor: one one-third of the distance from one end, and one point one-third the distance from the other end. The deduction is assigned based on the location with lower observed frequencies. If observations cannot be made, frequencies may be obtained through route schedules.

% Routes with at Least 4 Buses per Hour	Points
Both observed locations have at least 1 bus per 15 minutes (4 buses per hour)	0
One or more observed locations has less than 1 bus per 15 minutes (4 buses per hour)	-3

LOW PEAK PASSENGERS

-3 points maximum

BRT corridors with ridership levels below 2,000 passengers per hour per direction (pphpd) during the peak hour carry fewer passengers than a normal mixed-traffic lane. Very low ridership can indicate that other bus services continue to operate in the corridor and compete with the BRT services. Alternatively, low ridership indicates that a corridor was poorly selected.

Almost all cities have corridors carrying at least a thousand pphpd during the peak hour. Many cities, however, have corridors where transit demand is very low, even below this level. While many Gold-Standard BRT features would still bring benefits in these conditions, it is unlikely that such levels would justify the cost and dedicated right-of-way intrinsic to BRT. The threshold is intended to be low enough to avoid overly penalizing corridors in smaller cities with lower transit demand.

Scoring Guidelines: Deductions should be assigned according to the maximum peak-hour ridership on the corridor.

Passengers per Hour per Direction (PPHPD) in Peak Hour	Points
PPHPD equal to or greater than 2000	0
PPHPD between 2000 and 1000	-1
PPHPD between 1000 and 600	-2
PPHPD below 600	-3

PEDESTRIANS AND CYCLIST FATALITIES ALONG CORRIDOR

-2 points maximum

Traffic safety data is vital to ensuring that transportation systems operate safely and evaluating efforts to improve safety. All cities should collect traffic safety data and make this information public to track progress. The fatality rate is the best safety metric for pedestrians and cyclists, the most vulnerable users along a street. To best understand and improve safety, this information must be publicly available.

Pedestrians and Cyclist Fatality Rates along Corridor	Points
Fatality rates for pedestrians and cyclists are known and made public	0
Fatality rates along the corridor are known but not made public	-1
Fatality rates along the corridor are not known and not made public	-2

PERMITTING UNSAFE BICYCLE USE

-1 point maximum

Bicycles and other micromobility devices in busways are generally discouraged. They are particularly dangerous in bus lanes with speed limits greater than 25 kilometers per hour (15 miles per hour) and/or bus lanes with widths less than 4 meters (13 feet). If cycling is observed in these conditions, a deduction should be made.

Micromobility is defined as small, lightweight devices that are either human-powered or electric and operate at speeds typically lower than 25 kilometers per hour (15 miles per hour).

Permitting Unsafe Bicycle and Micromobility Use	Points
Cycling and other micromobility devices permitted in bus lanes with speed limits greater than 25 kilometers per hour (15 miles per hour) and/or bus lanes with widths less than 4 meters (13 feet)	-1

APPLICATION TO RAIL CORRIDORS

120A
ST
EMERGENCY
Paid Fare Zone

APPLICATION TO RAIL CORRIDORS

The *BRT Standard* was specifically designed by BRT experts to be applied to BRT corridors. However, almost all of the elements in the *BRT Standard* could easily be applied to rail transit corridors (including streetcar, tram, light-rail, and metro) with minimal modification, and ITDP has done so in the Rapid Transit Database. Using the *BRT Standard* to evaluate rail transit corridors would allow users to assess the general quality of rail transit services and compare them to other transit corridors, including BRT. It could also provide a more standard definition of rapid transit and determine which rail transit corridors meet that definition. The following section briefly describes how the *BRT Standard* might be applied to rail transit corridors.

BRT Basics

The *BRT Standard* defines the BRT Basics as a set of elements essential to a service's being called BRT. These elements all aim to minimize passenger delay, thus ensuring the "rapid" component of a bus rapid transit corridor. These same criteria can be applied without modification to rail transit corridors to assess whether they meet a more general definition of rapid transit.

Terminology

The *BRT Standard* often refers to "busways," "BRT," and "buses." When using the *BRT Standard* to assess rail transit corridors, these should be substituted with "transitways," "rapid transit," and "transit vehicles" throughout the text. The definitions of a corridor would also need to be modified to account for rail.

Pavement Quality

The *BRT Standard* metric of pavement quality should be modified to evaluate rail quality in that they are designed for a thirty-year life span. If there are other considerations, ITDP welcomes feedback on how to translate the pavement quality metric for rail.

PREVIOUS PAGE: A Metro Valley light rail train at a platform station on Main Street in downtown Mesa. The Phoenix LRT system scored a Bronze on the 2012 BRT Standard.
CREDIT: Around the World Photos

Signaling

The distance between rail vehicles is largely governed by the type of signal system that is used. Better signals can allow for higher frequencies and improved service. Signaling is the traffic management system for rail, critical for the system's throughput, speed, efficiency, and safety. The signaling needed for BRT systems involves the road-based traffic management system, usually traffic lights. These are not comparable, so applying the *BRT Standard* to rail is hard. Ideally, to evaluate rail transit corridors, a separate section would be added to address signal systems. Since that does not exist yet, when using the *BRT Standard* for rail corridors, hopefully, the effects of the signaling system are captured in the deductions for operations. ITDP, however, welcomes feedback on how to add a section on signaling for rail.

Elements Specific to BRT

Some elements of the *BRT Standard* are more common in BRT corridors. For example, very few metro and light-rail systems offer express, limited-stop, and local services or multiple routes operating on the same corridor. There are, however, prominent rail examples of both, such as the New York City Subway or the Lyon Tramway. These bus-specific elements provide a higher quality of transit service for any mode and should be retained, even if they seldom result in points for rail systems.

Grade-separated Electric Systems

Fully grade-separated electric rail transit systems, such as metro, will likely receive maximum points in a number of categories, including Transitway Alignment, Off-Board Fare Collection, Intersection Treatments, Minimizing Emissions, Stations Set Back from Intersections, and Platform-Level Boarding. This is logical, as grade separation removes many of the sources of delay that a transit system might encounter, making them more likely to achieve the Gold Standard.

APPENDIX

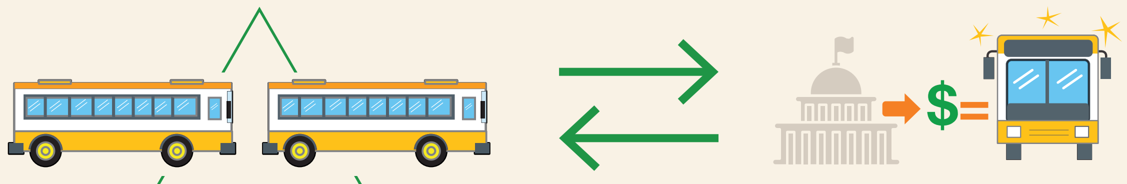

उभी करू वनराई
मनुष्य आणि वृक्ष
होतील भाई-भाई
पुणे
महानगर पालिका
Pune Municipal
Corporation
SCHOOL BUS
GLOBAL CARGO FLEETS
SCHOOL VAN

A RIDE TO BETTER BRT

GOOD INFRASTRUCTURE AND OPERATIONS ARE FUNDAMENTAL FOR GOOD BRT. TO ACHIEVE THIS, **GOVERNMENT OVERSIGHT AND INVESTMENT** IN INFRASTRUCTURE, MAINTENANCE, AND OPERATIONS ARE ESSENTIAL.

Higher Investment = Better Performance

Riders enjoy the system and see it as a vital transport option



Government actively manages operations and provides subsidies

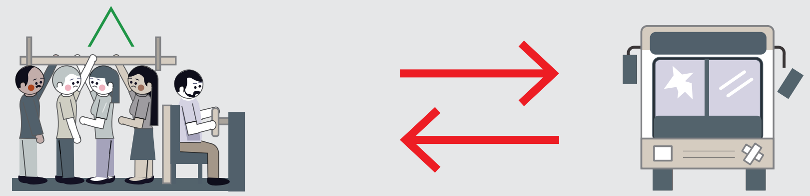
Operators add service to minimize crowding

Government builds political support for maintaining operational subsidies

Investment in operations, together with good governance, enables better frequency, improved reliability, reduced crowding, improved security and passenger comfort, and more equitable coverage.

Poorer Investment = Worse Performance

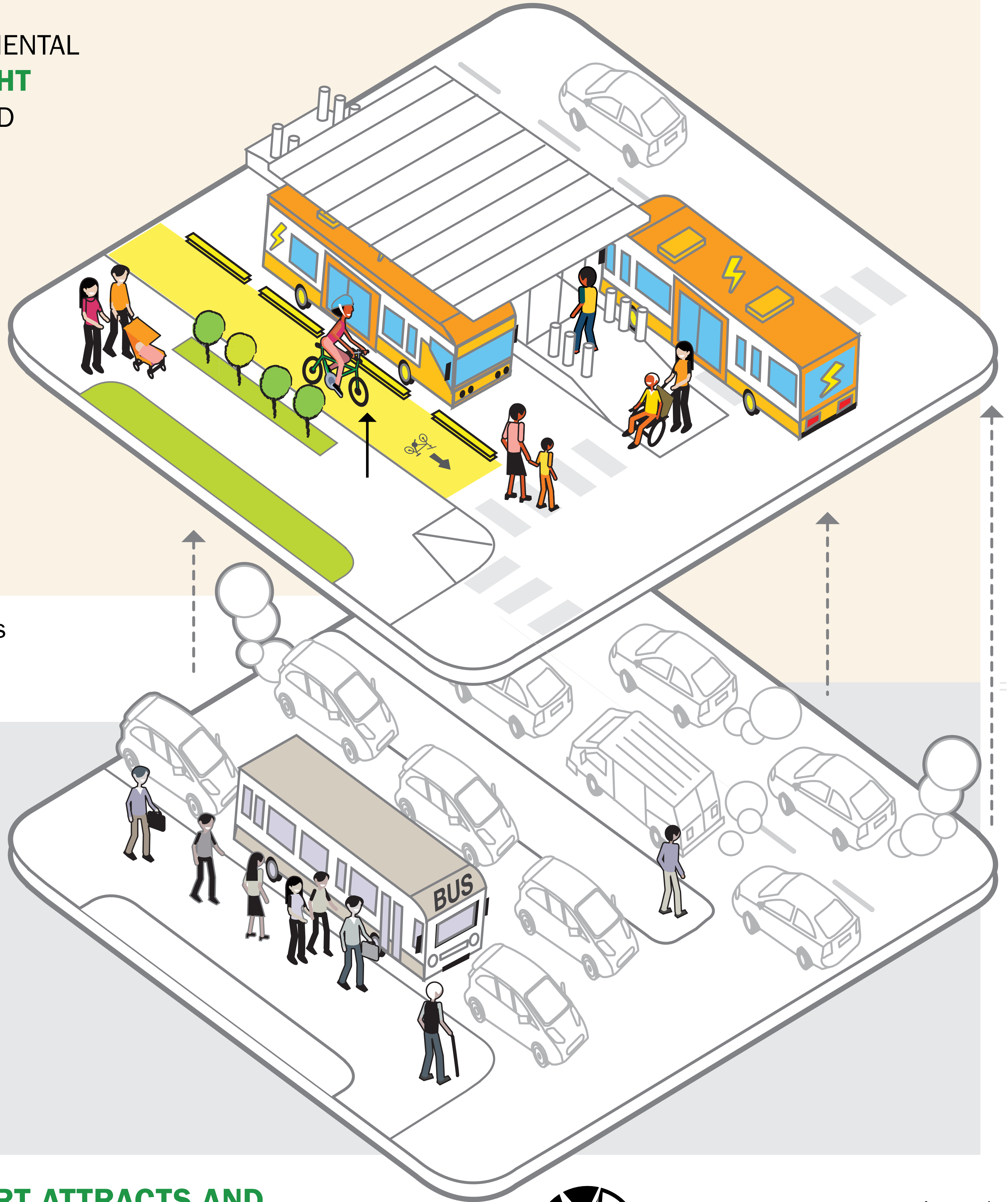
Riders deal with longer waits, unsafe driving, and crowded buses that lead to harassment and a reduced sense of safety



Government doesn't invest in operations; service conditions erode

Operators struggle to stay profitable and cut service

Government hears complaints about service, crashes, etc., and ridership decreases



Government funding and oversight create better BRT and EVERYONE benefits:

- Riders
- Operators
- Cities

Faster trips (Riders, Operators, Cities)

Cost efficient trips (Riders, Operators, Cities)

Greater access (Riders, Cities)

Reduced emissions (Riders, Cities)

Improved safety Reduce harassment (Riders, Operators, Cities)

Increased demand (Cities, Operators)

THROUGH SUSTAINED INVESTMENT IN OPERATIONS, BRT ATTRACTS AND RETAINS RIDERS; OPERATORS ENSURE EQUITY AND SAFETY; AND THE GOVERNMENT MEETS GOALS OF BETTER ACCESS AND REDUCED EMISSIONS.

ITDP

Access the new BRT Standard and stay up-to-date on related resources at

ITDP.ORG

WHAT DOES OVERCROWDING LOOK LIKE?

Below are illustrations of what it can look like when we set parameters of people per square meter.

NUMBER OF PEOPLE STANDING PER SQUARE METER
(AS SHOWN IN A 2 METER BY 2 METER SPACE)

4 PEOPLE

PER SQUARE METRE

Having at least 15-30 cm between people allows them to gesture and move comfortably. This space allows people to use wheelchairs or strollers, or carry children or bags on their back.

5 PEOPLE

PER SQUARE METRE

Here it is more difficult to have adequate space for people carrying goods, people with disabilities, caregivers, or families.

Redrawn from Keith Still, G. Keith, Crowd Safety and Crowd Risk Analysis, https://www.gkstill.com/Support/crowd-density/CrowdDensity-1.html

Overcrowding presents a significant barrier to public transport users, especially people with disabilities, older people, people carrying goods, caregivers, women, and children. It also increases the stress of daily trips and deters regular ridership. Quality transport systems must consider and address these issues.

6 PEOPLE

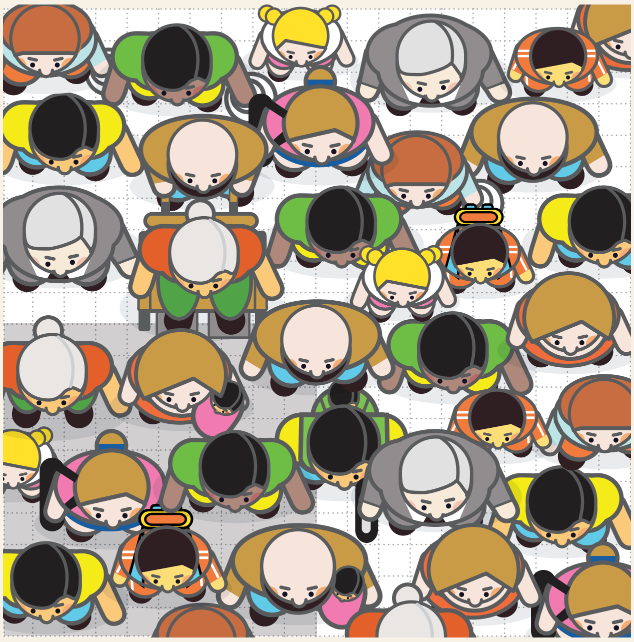
PER SQUARE METRE

Here there is little space for gestures or movements, and almost no space to naturally accomodate people with disabilities, caregivers, families, or people carrying goods.

7 PEOPLE

PER SQUARE METRE

Users at this level experience an uncomfortable and stressful level of crowding that may prevent and dissuade ridership altogether.



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