

# THE BRT STANDARD

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**The BRT Standard**  
**2014 Edition**

Cover Photo: The TransMilenio system in Bogotá, Colombia inspired a wave of BRT innovation around the world.

Cover Photo Credit: Carlos Felipe Pardo



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The Metroplus BRT, in Medellín, Colombia, provides a critical link in the city's diverse transit network.



L1 Ruta<sup>n</sup> - UdeA

# INTRODUCTION

# Introduction

*The BRT Standard* is an evaluation tool for world-class bus rapid transit (BRT) based on international best practices. It is also the centerpiece of a global effort by leaders in bus rapid transit design to establish a common definition of BRT and ensure that BRT systems more uniformly deliver world-class passenger experiences, significant economic benefits, and positive environmental impacts.

Despite the increasing prevalence, prominence, and success of BRT, many remain unaware of the characteristics of the best BRT corridors and their ability to provide levels of service more typically associated with metro and subway systems. This lack of awareness frequently results in a preference for rail when BRT is in fact a comparable, more cost-effective, and equally elegant solution. This false impression stems partly from the lack of a common definition for BRT. Without a definition, modest improvements to standard bus service are often inaccurately labeled as BRT.

*The BRT Standard* functions as a means of achieving a common definition, as a scoring system, and as a planning tool. By defining the essential elements of BRT, it provides a framework for system designers, decision-makers, and the sustainable-transport community to identify and implement top-quality BRT corridors.

*The BRT Standard* celebrates cities that are leading the way in BRT excellence and offers best practice-based guidance to those planning a system.

Certifying a BRT corridor as basic BRT, bronze, silver, or gold places it within the hierarchy of international best practice; however, all standard levels represent excellence in BRT. Cities with certified BRT corridors are beacons of progress that have adopted a cutting-edge form of mass transit, elevating urban transport to a new level of excellence while making communities more livable, competitive, and sustainable. From Guadalajara, Mexico, to Guangzhou, China,

cities that have built gold-standard BRT have seen significant benefits to commuters, increased revitalization of city centers, and better air quality.

As we continue to clarify and elevate the standards to which all BRT systems are built, more people will experience the convenience and comfort of this cutting-edge mode of transport, and more cities will experience the benefits of an efficient and cost-effective mass-transit system. We hope that helping to define and recognize good-quality BRT will bring about the fundamental change needed to shift people out of their cars through modern and sustainable BRT. *The 2014 Standard* reinforces the basic elements for bus rapid transit and makes some improvements to the earlier versions to strengthen the BRT brand.

# Why was The BRT Standard Created?

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*The BRT Standard* was developed to create a common definition of bus rapid transit and recognize high-quality BRT systems around the world. It also functions as a technical tool to guide and encourage municipalities to consider the key features of the best BRT systems as they move through the design process.

Historically, there had been no common understanding of what constitutes BRT, and the lack of a shared definition has caused confusion about the concept. The absence of an agreement among planners and engineers meant that for every new BRT corridor that is world-class, dozens of bus corridors opened that were incorrectly labeled BRT. The lack of any sort of quality control made it possible for modest bus system improvements to be branded as BRT, leading to some backlash against BRT. Modest incremental improvements, while beneficial, are often not the most cost-effective solution, and they certainly do not add up to the fundamental change needed to shift the travel paradigm from a dispersed pattern of private automobile travel to bus-based mass transit.

BRT also plays an important role in the global effort to reduce transport-sector emissions. As emissions from private motor vehicle use grow, shifting these trips onto public transit by improving the quality and reach of BRT becomes critical. Establishing a quality standard for BRT ensures not only that better projects are built but that transport sector emissions are reduced.

Certifying a BRT corridor as gold, silver, bronze, or basic sets an internationally recognized standard for what BRT is and what is best practice in BRT. The elements that receive points in *The BRT Standard* have been evaluated in a wide variety of contexts. When present, they result in consistently improved system performance and have a positive impact on ridership.



# What's New in 2014?

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*The BRT Standard*, 2014 Edition is the culmination of a review of *The BRT Standard*, 2013 Edition by *The BRT Standard* Technical Committee and practitioners around the world. Revisions were made collectively by the Technical Committee, a group comprising the world's leading BRT engineers, designers, and planners. Descriptions of the most significant changes follow in the sections below.

- **Corridor Definition**

The definition of a BRT corridor has been reduced from 4 kilometers (km) (2.5 miles) in length to 3 km (1.9 miles) to allow BRT corridors in downtown areas to qualify as BRT. These downtown corridors can provide valuable connections to the regional transit network, even if they are relatively short in length.

- **Frequency Penalties**

The most significant change for 2014 has been the removal of the peak and off-peak frequency design metrics and the addition of penalties for low peak and off-peak frequencies. This was done because the setting of route frequencies was seen as more of an operational rather than a design decision.

- **Emphasis on Basics**

An additional point was added to each of the BRT Basic elements, creating a greater emphasis on the basic elements of BRT. The scoring of the Basics categories has been reconfigured alongside the additional points.

# Governance

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

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

## **The BRT Standard Technical Committee members include:**

Manfred Breithaupt, *GIZ*

Wagner Colombini Martins, *Logit Consultoria*

Paulo Custodio, *Consultant*

Walter Hook, *ITDP*

Colleen McCaul, *Consultant*

Gerhard Menckhoff, *World Bank (retired)\**

Carlos Felipe Pardo, *Slow Research*

Scott Rutherford, *University of Washington\**

Pedro Szasz, *Consultant*

Lloyd Wright, *Asian Development Bank\**

Unless indicated by an asterisk (\*), each committee member also represents his or her institution.

The emissions scoring detail for buses was recommended by the International Council on Clean Transportation (ICCT), an international non-profit 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 have a commitment to high-quality public transport and dedication to its contribution to social and economic development.

They 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

Gesellschaft für Internationale Zusammenarbeit (GIZ)

Institute for Transportation and Development Policy (convener)

International Council on Clean Transportation (ICCT)

Rockefeller Foundation

United Nations Environment Programme (UNEP)

# The BRT Standard Scorecard

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The *BRT Standard* scoring system was created as a way of protecting the BRT brand and offering recognition to high-quality BRT systems around the world. Certifying a BRT corridor as gold, silver, bronze, or basic sets an internationally recognized standard for the current best practice for BRT.

## Awarding Points

Points are awarded for the elements of corridor design that most significantly improve operational performance and quality of service. The full point system is shown on page 12 and described in detail throughout the rest of this document. The criteria used to determine the point system are as follows:

- The points should act as proxies for a higher quality of customer service (speed, comfort, capacity, etc.).
- The points should be awarded based on a general consensus among BRT experts on what constitutes best practice in system planning and design, and the relative importance of those factors.
- The points should reward good, often politically challenging design decisions made by the project team that will result in superior performance rather than rewarding characteristics that may be innate to the corridor.
- The metrics and weightings should be easily and equitably applicable and 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 readily be obtained.

The maximum number of points a system can earn is 100. On the next page is an overview of the four *BRT Standard* point categories. Bronze, silver, and gold rankings all 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 but has not quite reached the same level of excellence as those that have received awards.

# BRT Standard Rankings



## **Gold-standard BRT** **85 Points or above**

Gold-standard BRT is consistent in almost all respects with international best practice. These systems achieve the highest level of operational performance and efficiency while providing a high quality of service. It is achievable on any corridor with sufficient demand to justify BRT investments, but may cost a little more to achieve. These systems have the greatest ability to inspire the public, as well as other cities.



## **Silver-standard BRT** **70–84 points**

Silver-standard BRT includes most of the elements of international best practice and is likely to be cost-effective on any corridor with sufficient demand to justify BRT investment. These systems achieve high operational performance and quality of service.



## **Bronze-standard BRT** **55–69 points**

Bronze-standard BRT solidly meets the definition of BRT and is mostly consistent with international best practice. 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, yet a corridor may only qualify as Basic BRT.



# Design versus Performance

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

- **The ability to assess both planned and existing corridors:** *The BRT Standard* intended to help guide planning and design decisions prior to corridor implementation. The scoring tool is usable both for planned and built corridors, whereas performance standards are only applicable when assessing existing corridors.
- **Good data is rare and expensive:** While the effect of the BRT corridor on a passenger's door-to-door travel time is the ideal performance appraisal metric, this data is extremely difficult, expensive, and time-consuming to collect and nearly impossible to independently corroborate.

## Other Project Appraisal Tools

*The BRT Standard* is intended to complement cost-effectiveness measurements and system-performance evaluations. Using only cost-effectiveness appraisal tools without *The BRT Standard* could lead to underspending on the capital investments that would actually increase operating costs or overspending on measures that cannot really be justified under certain circumstances. For these reasons, *The BRT Standard* should be used in tandem with cost-effectiveness or cost-benefit evaluation.

Similarly, *The BRT Standard* may be a useful element of project appraisal as a way of testing the credibility of claimed speed improvements or other performance claims made as part of a more systematic "performance-based" appraisal, such as the U.S. Federal Transit Administration's cost-effectiveness analysis or the internal rate-of-return analysis required by the development banks during project appraisal.

## Process

*The BRT Standard* is reviewed and updated annually by the Technical Committee. Corridors will be evaluated by individual members of the Technical Committee over the course of the year, and their scores will be submitted to the full committee to certify at the end of each year. Only corridors that have not previously been scored will be eligible for scoring; previously scored corridors, however, may request to be rescored. In addition, the Technical Committee may request that a corridor be rescored if it has experienced significant design changes or operational improvements or degradation. When the new score is released, the justification for rescoring the corridor will also be included.

Scores will be released each year and used as a means to compare and celebrate those cities that have implemented true BRT, making the politically courageous and technically difficult decisions necessary to get there.

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

For any questions on the scoring process, please contact us at [brtstandard@itdp.org](mailto:brtstandard@itdp.org).





# SCORING IN DETAIL

The 9 de Julio BRT, in Buenos Aires, Argentina, reclaimed multiple lanes of traffic for transit use.



# The BRT Standard Scorecard

This scorecard shows the criteria and point values that make up The BRT Standard, followed by a detailed description of each.

## CATEGORY MAX SCORE

### **BRT Basics** (PP. 14–23)

Dedicated Right-of-Way	8
Busway Alignment	8
Off-board Fare Collection	8
Intersection Treatments	7
Platform-level Boarding	7

### **Service Planning** (PP. 24–30)

Multiple Routes	4
Express, Limited, and Local Services	3
Control Center	3
Located in Top Ten Corridors	2
Demand Profile	3
Hours of Operations	2
Multi-corridor Network	2

### **Infrastructure** (PP. 31–36)

Passing Lanes at Stations	4
Minimizing Bus Emissions	3
Stations Set Back from Intersections	3
Center Stations	2
Pavement Quality	2

### **Stations** (PP. 37–41)

Distances Between Stations	2
Safe and Comfortable Stations	3
Number of Doors on Bus	3
Docking Bays and Sub-stops	1
Sliding Doors in BRT Stations	1

## CATEGORY MAX SCORE

### **Communications** (PP. 42–43)

Branding	3
Passenger Information	2

### **Access and Integration** (PP. 44–49)

Universal Access	3
Integration with Other Public Transport	3
Pedestrian Access	3
Secure Bicycle Parking	2
Bicycle Lanes	2
Bicycle-sharing Integration	1

### **Point Deductions** (PP. 50–54)

Commercial Speeds	-10
Minimum Peak Passengers per Hour per Direction (pphpd) Below 1,000	-5
Lack of Enforcement of Right-of-Way	-5
Significant Gap Between Bus Floor and Station Platform	-5
Overcrowding	-5
Poorly Maintained Busway, Buses, Stations, and Technology Systems	-10
Low Peak Frequency	-3
Low Off-peak Frequency	-2

# Definition of a BRT Corridor

*The BRT Standard* is to be applied to specific BRT corridors rather than to 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 (1.9 miles) that has dedicated bus lanes.”

The primary 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 both efficiency and cost. To avoid rewarding systems that don't make this political choice, the corridor needs to be defined as including dedicated bus lanes.

## The BRT Basics

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 lowering operating cost. They are of critical importance in differentiating BRT from standard bus service. The five essential elements of BRT are:

**Dedicated right-of-way:** 8 points\*

**Busway alignment:** 8 points\*

**Off-board fare collection:** 8 points

**Intersection treatments:** 7 points

**Platform-level boarding:** 7 points

\*Of the five essential elements, a corridor must score at least 4 on both busway alignment and dedicated right-of-way **AND** must achieve a minimum of 20 points across all five categories to be identified as BRT.

## Minimum Requirements for a Corridor to be Considered BRT

1. At least 3km length with dedicated lanes
2. Score 4 or more points in dedicated right-of-way element
3. Score 4 or more points in busway alignment element
4. Score 20 or more points across all five BRT Basics elements



# Examples of BRT Corridors

**Note:** To qualify as BRT, a corridor must also meet the BRT Basics

## Example 1: A 3km Corridor



## Example 2: A 3km Corridor



## Example 3: NOT A Corridor



# Dedicated Right-of-Way

8 points maximum

A dedicated right-of-way is vital to ensuring 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 take a lane away from mixed traffic to dedicate it as a busway.

Dedicated lanes can be segregated and enforced in different ways and can have varying degrees of permeability (e.g., delineators, electronic bollards, car traps, colorized pavement, and camera enforcement). In some designs the bus stations themselves can act as a barrier. 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 three kilometers of dedicated bus lanes, this element evaluates the quality of the segregation and enforcement throughout the corridor, including sections without dedicated lanes.

**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 scoring system is based on the amount of corridor that has dedicated right-of-way for BRT services and the quality of the segregation and enforcement in relation to observed peak-hour congestion. Exceptions are permitted for emergency vehicles.

Type of Dedicated Right-of-Way	POINTS
Dedicated lanes and full enforcement or physical segregation applied to over 90% of the busway corridor length	8
Dedicated lanes and full enforcement or physical segregation applied to over 75% of the busway corridor length	7
Delineators only or colorized pavement only without other enforcement measures applied to over 75% of the busway corridor length	5
Delineators only or colorized pavement only without other enforcement measures applied to over 40% of the busway corridor length	3
Delineators only or colorized pavement only without other enforcement measures applied to over 20% of the busway corridor length	2
Camera-enforcement with signs only	1



Transoeste, in Rio de Janeiro, Brazil illustrates full segregation.

# Busway Alignment

8 points maximum

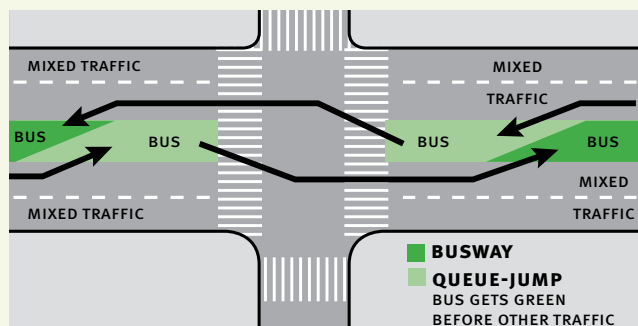
The busway is best located where conflicts with other traffic can be minimized, especially from turning movements from mixed-traffic lanes. In most cases, a busway in the central verge of a roadway encounters fewer conflicts with turning vehicles than those closer to the curb due to alleys, parking lots, etc. Additionally, while delivery vehicles and taxis generally require access to the curb, the central verge of the road usually remains free of such obstructions. All of the design configuration recommendations detailed 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 trunk corridor of each particular configuration multiplied by the points associated with that configuration and then adding those numbers together.

Trunk Corridor Configurations	POINTS
<b>TIER 1 CONFIGURATIONS</b>	
Two-way median-aligned busways that are in the central verge of a two-way road	8
Bus-only corridors where there is a fully exclusive right-of-way and no parallel mixed traffic, such as transit malls (e.g., Bogotá, Curitiba, Quito, and Pereira) and converted rail corridors (e.g., Cape Town and Los Angeles)	8
Busways that run adjacent to an edge condition like a waterfront or park where there are few intersections to cause conflicts	8
Busways that run two-way on the side of a one-way street	6
<b>TIER 2 CONFIGURATIONS</b>	
Busways that are split into two one-way pairs but are centrally aligned in the roadway	5
Busways that are split into two one-way pairs but aligned to the curb	3
<b>TIER 3 CONFIGURATIONS</b>	
Virtual busway that operates bi-directionally in a single median lane that alternates direction by block.	1
<b>NON-SCORING CONFIGURATIONS</b>	
Curb-aligned busway on a two-way road	0

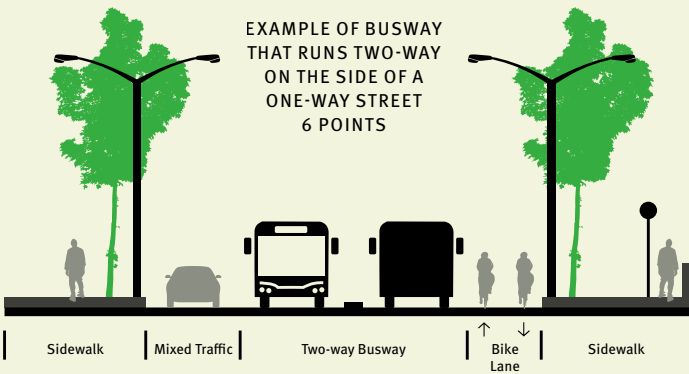
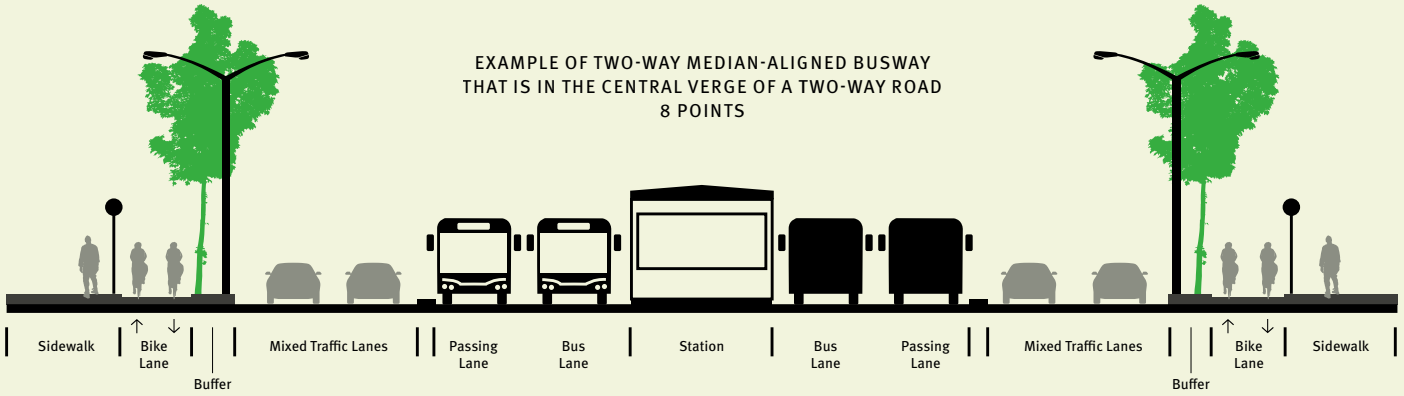
EXAMPLE OF A VIRTUAL BUSWAY  
1 POINT



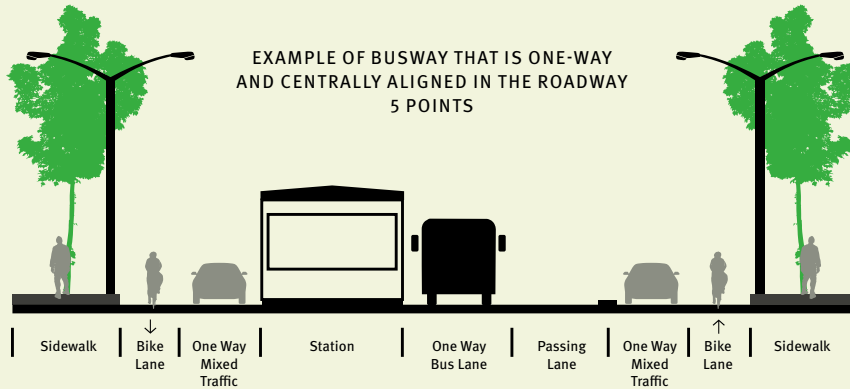
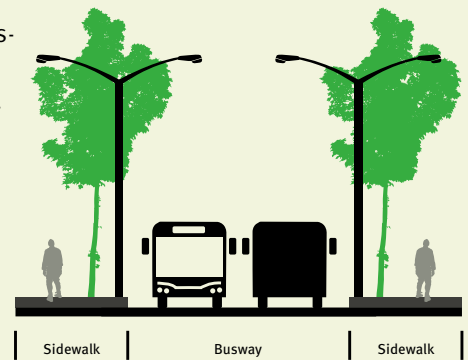
Virtual busways can be utilized in restricted or narrow road widths to provide dedicated right-of-way for BRT. A virtual busway is a single bus lane in the middle of a roadway that is non-reversible but is shared between the two directions of travel. The direction of travel within the bus lane depends 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 vehicles' direction of travel.

## A Few Examples of Busway Configurations

These sections are only meant to show an example and are not meant to be inclusive of all possible configurations.



EXAMPLE OF A BUS-ONLY CORRIDOR WHERE THERE IS EXCLUSIVE RIGHT-OF-WAY AND NO PARALLEL MIXED TRAFFIC  
8 POINTS





**TOP**

A kiosk sells tickets for the proof-of-payment system used in Las Vegas, USA.

**BOTTOM**

Turnstiles control access into TransJakarta's stations in Jakarta, Indonesia.



# Off-board Fare Collection

## 8 points maximum

Off-board fare collection is one the most important factors in reducing travel time and improving the customer experience.

There are presently two basic approaches to off-board fare collection: “Turnstile-controlled,” where passengers pass through a gate, turnstile, or checkpoint upon entering the station where their ticket is verified or fare is deducted, and “proof-of-payment,” where passengers pay at a kiosk and collect a paper ticket that is then checked on board the vehicle by an inspector. Both approaches can significantly reduce delay. However, turnstile-controlled is slightly preferred because:

- It is easier to accommodate multiple routes using the same BRT infrastructure;
- 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;
- Proof-of-payment can cause anxiety for passengers who may have misplaced tickets;
- The data collected by turnstile-controlled systems upon boarding, and sometimes upon alighting, can be useful in future system planning.

On the other hand, proof-of-payment systems on bus routes that extend beyond BRT corridors extend the benefits of time savings to those sections of the bus routes that lie beyond the BRT corridor.

**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 needs to occur during all operating hours.

Off-Board Fare Collection (During All Operating Hours)	POINTS
100% of stations on corridor have turnstile-controlled off-board fare collection	8
100% of routes that touch the corridor have proof-of-payment fare collection	7
80% of stations on corridor have turnstile-controlled off-board fare collection	7
80% of routes that touch the corridor have proof-of-payment fare collection	6
60% of stations on corridor have turnstile-controlled off-board fare collection	6
60% of routes that touch the corridor have proof-of-payment fare collection	5
40% of stations on corridor have turnstile-controlled off-board fare collection	5
40% of routes that touch the corridor have proof-of-payment fare collection	4
20% of stations on corridor have turnstile-controlled off-board fare collection	3
20% of routes that touch the corridor have proof-of-payment fare collection	2
< 20% of stations on corridor have turnstile-controlled off-board fare collection < 20% of routes that touch the corridor have proof-of-payment fare collection	0

# Intersection Treatments

## 7 points maximum

There are several ways to increase bus speeds at intersections, all of which are aimed at increasing the green-signal time for the bus lane. Forbidding turns across the bus lane and minimizing the number of traffic-signal phases where possible are the most important. Traffic-signal priority, when activated by an approaching BRT vehicle, is useful in lower-frequency systems but less effective than turn prohibitions.

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

Intersection Treatments	POINTS
All turns prohibited across the busway	7
Most turns prohibited across the busway	6
Approximately half of the turns prohibited across the busway and some signal priority	5
Some turns prohibited across the busway and signal priority at most intersections	4
Some turns prohibited across the busway and some signal priority	3
No turns prohibited across the busway but signal priority at most intersections	2
No turns prohibited across the busway but some intersections have signal priority	1
No intersection treatments	0



Left turns are not allowed at this intersection along the BRT corridor in Las Vegas, USA.

Platform-level boarding speeds boarding and alighting in Ahmedabad, India.



## Platform-level Boarding

7 points maximum

Having the bus-station platform level with the bus floor is one of the most important ways of reducing boarding and alighting times per passenger. Passengers climbing even relatively minor steps can mean significant delay, particularly for the elderly, disabled, or people with suitcases or strollers. The reduction or elimination of the vehicle-to-platform gap is also key to customer safety and comfort. There are a range of measures to achieve gaps of less than 5 cm (2 in.), including guided busways at stations, alignment markers, Kassel curbs, and boarding bridges. The scoring does not take into account which technique is chosen, just so long as the gap is minimized.

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

**Scoring Guidelines:** Station platforms should be at the same height as bus floors, regardless of the height chosen.

Percentage of Buses with At-Level Boarding	POINTS
100% of buses are platform level; system-wide measures for reducing the gap in place	7
80% of buses; system-wide measures for reducing the gap in place	6
60% of buses; system-wide measures for reducing the gap in place	5
100% of buses are platform level with no other measures for reducing the gap in place	4
40% of buses	3
20% of buses	2
50% of buses are platform level with no other measures for reducing the gap in place	2
10% of buses	1
No platform-level boarding	0

# Service Planning

## Multiple Routes

4 points maximum

Having multiple routes operate on a single corridor is a good proxy for reduced door-to-door travel times by reducing transfer penalties.

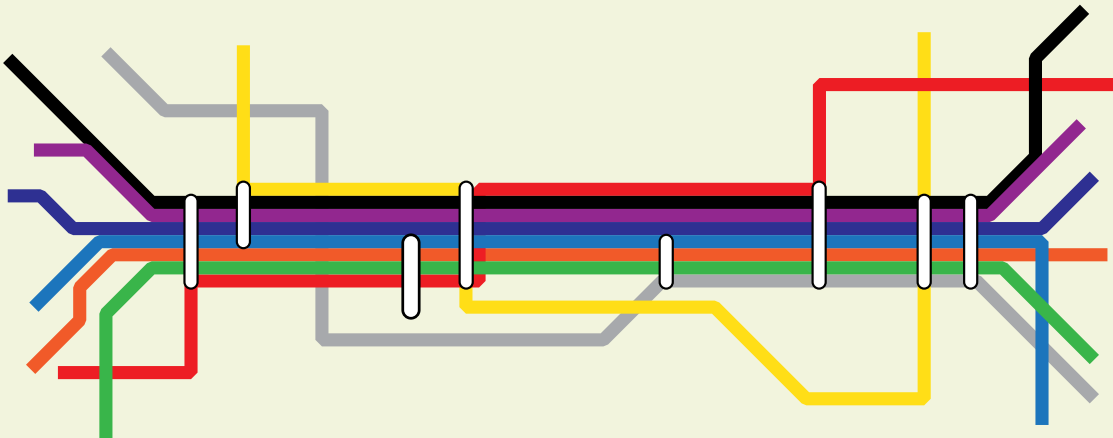
This can include:

- Routes that operate over multiple corridors, as exists with TransMilenio in Bogotá or Metrobús in Mexico City;
- Multiple routes operating in a single corridor that go to different destinations once they leave the corridor, as exists with the Guangzhou, Cali, and Johannesburg BRT systems.

This flexibility of bus-based systems is one of the primary advantages of BRT that is frequently not well used or understood.

Multiple Routes	POINTS
Two or more routes exist on the corridor, servicing at least two stations	4
No multiple routes	0

### BRT Corridor







Mexico City's Metrobús added an additional 20,000 daily passengers by adding a direct route connecting Corridor I (Insurgentes) with Corridor II (Eje 4), eliminating the transfer penalty between the two.



# Express, Limited, and Local Services

## 3 points maximum

One of the most important ways that mass-transit systems increase operating speeds and reduce passenger travel times is by providing limited and express services. While local services stop at every station, limited services skip lower-demand stations and stop only at major stations that have higher passenger demand. Express services often collect passengers at stops at one end of the corridor, travel along much of the corridor without stopping, and drop passengers off at the other end.

Infrastructure necessary for the inclusion of express, limited, and local BRT services is captured in other scoring metrics.

Service Types	POINTS
Local services and multiple types of limited and/or express services	3
At least one local <i>and</i> one limited or express service option	2
No limited or express services	0



Guangzhou has multiple services that run on the same corridor, as seen in the passenger information sign.

# Control Center

## 3 points maximum

Control centers for BRT systems are increasingly becoming a requirement for a host of service improvements, such as avoiding bus bunching, monitoring bus operations, identifying problems, and rapidly responding to them.

A full-service control center monitors the locations of all buses with GPS or similar technology and 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 boardings and alightings for future service adjustments
- Use Computer-Aided Dispatch (CAD)/Automatic Vehicle Location (AVL) for bus tracking and performance monitoring

A full-service center should be integrated with a public transport system's existing control center as well as the traffic signal system.

Control Center	POINTS
Full-service control center	3
Control center with most services	2
Control center with some services	1
No control center	0

The control center in Medellín, Colombia allows the operator to monitor BRT service across the system.



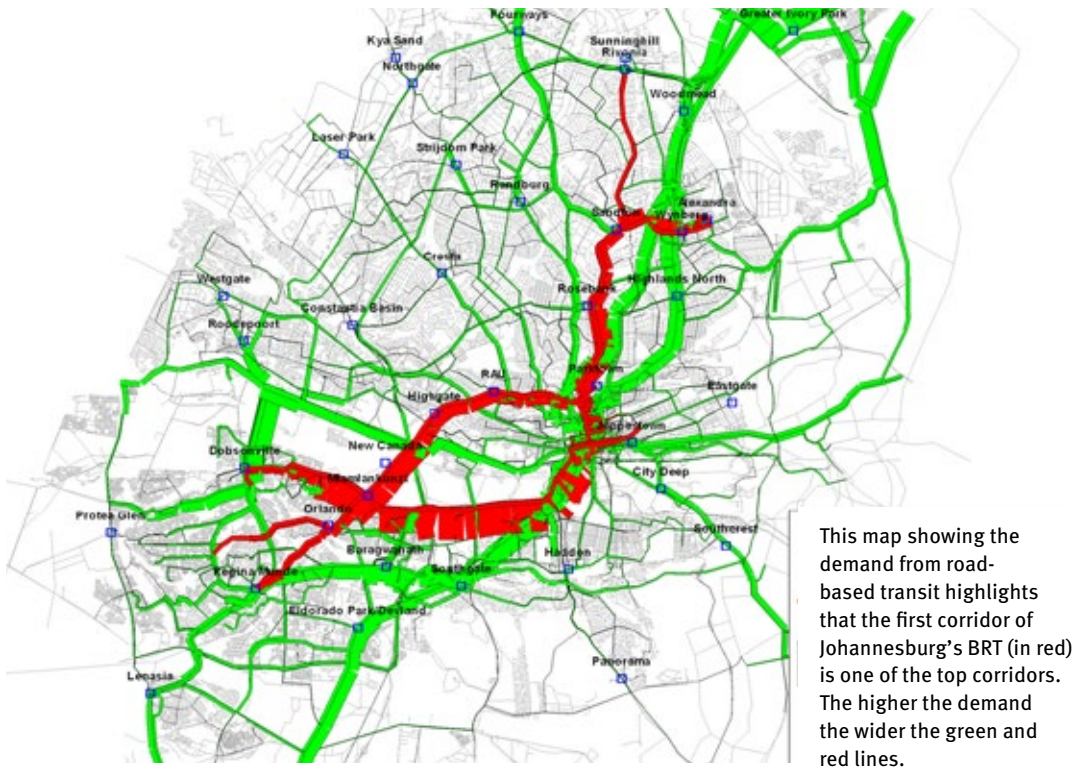
# Located In Top Ten Corridors

2 points maximum

If the BRT corridor is located along one of the top ten corridors, in terms of aggregate bus ridership, this will help ensure that a significant proportion of passengers benefit from the improvements. Points are awarded to systems that have made a good choice for the BRT corridor, regardless of the level of total demand.

**Scoring Guidelines:** If all top ten demand corridors have already benefited from public transport infrastructure improvements and the corridor, thus, lies outside the top ten, all points are awarded.

Corridor Location	POINTS
Corridor is one of top ten demand corridors	2
Corridor is outside top ten demand corridors	0





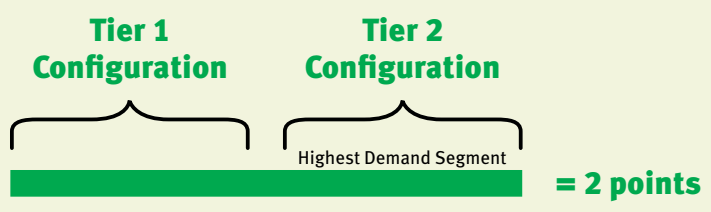
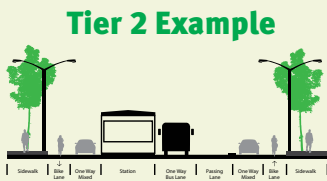
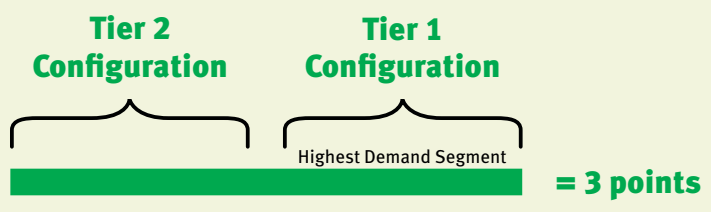
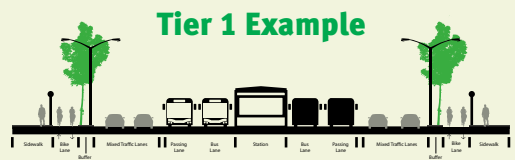
# Demand Profile

3 points maximum

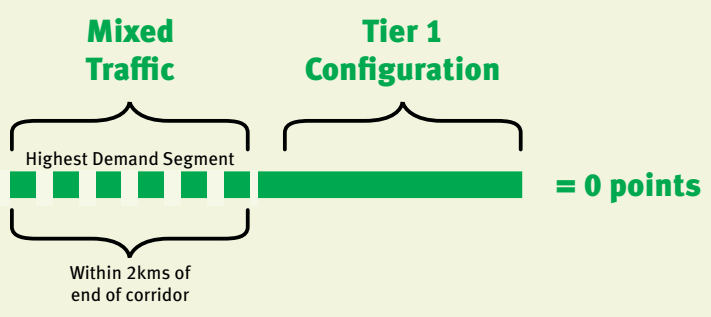
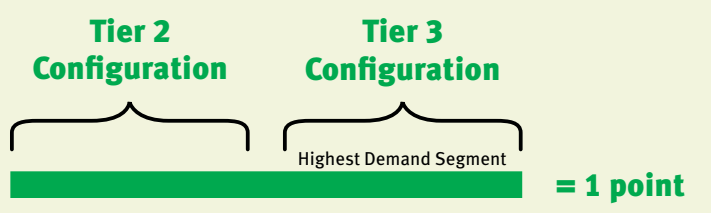
Building the highest-quality BRT infrastructure in the highest-demand segments of a road ensures that the greatest number of passengers benefit from the improvements. This is most significant when the decision is made whether or not to build a corridor through a downtown; however, it can also be an issue outside of a downtown on a road segment that has a variable demand profile.

**Scoring Guidelines:** The BRT corridor must include the road segment with the highest demand within a 2-kilometer distance of either end of the corridor. This segment should also have the highest quality of busway alignment in that section, and the score thus relates to that. The trunk corridor configurations defined in the Busway Alignment Section (see page 20) 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



For more detail about the tiers and more examples, please see page 18, Busway Alignment.



# Hours of Operations

2 points maximum

A viable transit service must be available to passengers for as many hours throughout the day and week as possible. Otherwise, passengers could end up stranded or may simply seek another mode.

**Scoring Guidelines:** Late-night service refers to service until midnight and weekend service refers to both weekend days.

Operating Hours	POINTS
Both late-night and weekend service	2
Late-night service, no weekends OR weekend service, no late nights	1
No late-night or weekend service	0



This map shows all existing and potential BRT corridors in Jakarta, Indonesia.

# Multi-corridor Network

2 points maximum

Ideally, BRT should include multiple corridors that intersect and form a network, as this expands travel options for passengers and makes the system more viable as a whole. When designing a new system, some anticipation of future corridors is useful to ensure the designs will be compatible with later developments. For this reason, a long-term plan is recognized, with an emphasis on near-term connectivity through either BRT services or infrastructure.

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

# Infrastructure

## Passing Lanes at Stations

4 points maximum

Passing lanes at station stops are critical to allow both express and local services. They also allow stations to accommodate a high volume of buses without getting congested with buses backed up waiting to enter. While more difficult to justify in low-demand systems, passing lanes are a good investment, yielding considerable passenger travel-time savings and allowing for flexibility as the system grows.

Passing Lanes	POINTS
Physical, dedicated passing lanes	4
Buses overtake in on-coming dedicated lanes	2
No passing lanes	0



TransMilenio, Bogotá, Colombia was the first to introduce passing lanes at stations, increasing the system's capacity.



Rea Vaya in Johannesburg introduced Euro IV buses for the first time to South Africa.



# Minimizing Bus Emissions

## 3 points maximum

Bus tailpipe emissions are typically a large source of urban air pollution. Especially at risk are bus passengers and people living or working near roadsides. 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 both passengers and the general urban population.

The primary determinant of tailpipe emission levels is the stringency of governments' emissions 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, our scoring is based on certified emissions standards rather than fuel type.

Over the last two decades, the European Union and the United States have adopted a series of progressively tighter emissions standards that are being used for this scoring system. Buses must be in compliance with Euro VI and U.S. 2010 emission standards to receive 3 points. These standards result in extremely low emissions of both PM and NOx. For diesel vehicles, these standards require the use of PM traps, ultra-low-sulfur diesel fuel, and selective catalytic reduction. To receive two points, buses need to be certified to Euro IV or V with PM traps (note: 50 ppm sulfur diesel fuel or lower is required for PM traps to function effectively).

Vehicles certified to the Euro IV and V standards that do not require traps emit twice as much PM as vehicles meeting more recent standards. Therefore, these vehicles are awarded one point. Ideally, buses will include contractually stipulated requirements in the purchase order to control real-world NOx emissions from buses in use, because the actual NOx emissions from urban buses certified to Euro IV and V have been tested at levels substantially higher than certified levels. Because that is hard to verify, it is included as a recommendation, but not as a requirement, for receiving the one point.

Zero points are awarded for U.S. 2004 and Euro III standards and less stringent standards, because these standards allow ten times as much PM emissions as the U.S. 2010 and Euro VI standards.

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 CO<sub>2</sub> impacts, we recommend the use of the TEEMP model, which incorporates *The BRT Standard* into a broader assessment of project-specific CO<sub>2</sub> impacts.

Emissions Standards	POINTS
Euro VI or US 2010	3
Euro IV or V with PM traps or US 2007	2
Euro IV or V or Euro III CNG or using verified PM trap retrofit	1
Below Euro IV or V	0

# Stations Set Back from Intersections

3 points maximum

Stations should be located at minimum 26 meters (85 feet), but ideally 40 meters (130 feet), from intersections to avoid delays. When stations are located just beyond the intersection, delays can be caused 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 delay buses from moving from the station and thus not allow other buses to pull in. The risk of conflict remains acute, particularly as frequency increases. Separating the stations from the intersections is critical to mitigating these problems.

**Scoring Guidelines:** The distance from the intersection is defined for the near side of the intersection as the stop line at the intersection to the front of a bus at the forward-most docking bay and for the far side of the intersection from the far edge of the crosswalk to the back of the bus at the rear-most docking bay.

Station Location	POINTS
75% of stations on corridor are set back at least 40 m (130 ft.) from intersection or meet at least one of the following exemptions: <ul style="list-style-type: none"> <li>Fully exclusive busways with no intersections</li> <li>Stations located near intersections due to block length (such as downtowns where blocks are relatively short)</li> </ul>	3
75% of stations on corridor are set back 26 m (85 ft.) from intersections or meet above exemptions	2
25% of stations on corridor are set back 26 m (85 ft.) from intersections or meet above exemptions	1
< 25% of stations on corridor are set back 26m (85 ft.) from intersections or meet above exemptions	0



Janmarg, in Ahmedabad, India has stations that are not immediately adjacent to the intersection.

A center platform station in Quito, Ecuador allows for convenient transfers.



## Center Stations

2 points maximum

Having a single station serving both directions of the BRT system makes transfers between the two directions easier and more convenient—something that becomes more important as the 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 system. If a physical connection between the two directions is not provided, fewer points are awarded.

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

**Scoring Guidelines:** The BRT corridor must include the road segment with the highest demand within a 2 kilometer distance from either end of the corridor. This segment should also have the highest quality of busway alignment in that section and the score thus relates to that. The trunk corridor configurations defined in the Busway Alignment Section are used here to score the demand profile.

Center Stations	POINTS
80% and above of stations on corridor have center platforms serving both directions of service	2
50% of stations on corridor	1
< 20% of stations on corridor	0



# Pavement Quality

## 2 points maximum

Good-quality pavement ensures better service and operations for a longer period by minimizing the need for maintenance on the busway. Roadways with poor-quality pavement will need to be shut down more frequently for repairs. Buses will also have to slow down to drive carefully over damaged pavement.

No matter what type of pavement, a 30-year life span is recommended. There are several options for the pavement structure to achieve that, with advantages and disadvantages for each. Three examples are described here:

- 1. Asphalt:** Properly designed and constructed, asphalt pavement can last 30-plus years with surface replacement every 10 to 12 years. This can be done without interrupting service, resulting in a smooth, quiet ride. For stations, rigid pavement is important to use to resist the potential pavement damage due to braking;
- 2. Jointed Plain Concrete Pavement (JPCP):** This type of pavement design can have a 30-plus-year life. To ensure this life, the pavement must have round dowel bars at the transverse joints, tied lanes by the use of reinforcing steel, and adequate thickness; and
- 3. Continuously Reinforced Concrete Pavement (CRCP):** Continuous slab reinforcement can add additional pavement strength and might be considered under certain design conditions. It is the most expensive option.

Pavement Materials	POINTS
Pavement structure designed for 30-year life over entire corridor	2
Pavement structure designed for 30-year life only at stations	1
Pavement design life less than 30 years	0



Lima, Peru uses reinforced concrete over its entire busway.



# Stations



STATIONS

DISTANCE BETWEEN STATIONS

## Distances Between Stations

2 points maximum

In a consistently built-up area, the distance between station stops optimizes at around 450 meters (1,476 ft.). Beyond this, more time is imposed on customers walking to stations than is saved by higher bus speeds. Below this distance, bus speeds will be reduced by more than the time saved with shorter walking distances. Thus, in keeping reasonably consistent with optimal station spacing, average distance between stations should not be below 0.3 km (0.2 mi.) or exceed 0.8 km (0.5 mi.).

**Scoring Guidelines:** 2 points should be awarded if stations are spaced, on average, between 0.3 km (0.2 mi.) and 0.8 km (0.5 mi.) apart.

Distance Between Stations	POINTS
Stations are spaced, on average, between 0.3 km (0.2 mi.) and 0.8 km (0.5 mi.) apart	2

# Safe and Comfortable Stations

## 3 points maximum

One of the main distinguishing features of a BRT system as opposed to standard bus service is a safe and comfortable station environment. Stations should have an internal width of at least 3 meters (10 ft.). Stations should be weather-protected, including from wind, rain, snow, heat and/or cold, as appropriate to the conditions in a specific location. Safe stations that are well-lit, transparent, and have security—whether through security guards or cameras—are essential to maintaining ridership. A clear intention to create attractive stations is also important to the image of the system and creates a sense of permanence and attractiveness that will attract not only riders but developers as well.

**Scoring Guidelines:** Stations should have at least 3 m (10 ft.) of internal width. This is the definition for “wide” in the scoring chart below.

Stations	POINTS
All stations on corridor are wide, attractive, weather-protected	3
Most stations on corridor are wide, attractive, weather-protected	2
Some stations on corridor are wide, attractive, weather-protected	1
No stations on corridor are wide, attractive, weather-protected	0



Stations in the El Mio BRT system in Cali, Colombia are comfortable and attractive.





Articulated BRT buses in Nantes, France have four doors for boarding and alighting quickly.

## Number of Doors on Bus

3 points maximum

The speed of boarding and alighting is partially a function of the number of bus doors. Much like a subway in which a car has multiple wide doors, buses need the same to let higher volumes of people on and off the buses. One door or narrow doorways become bottlenecks that delay the bus.

**Scoring Guidelines:** Buses need to have three or more doors on the station side of the bus for articulated buses or two wide doors on the station side for regular (non-articulated) buses and allow boarding through all doors to qualify for the below points.

Percentage of Buses with 3+ Doors or 2 Wide Doors on the Station Side and All-Door Boarding	POINTS
100%	3
65%	2
35%	1
< 35%	0

# Docking Bays and Sub-stops

## 1 point maximum

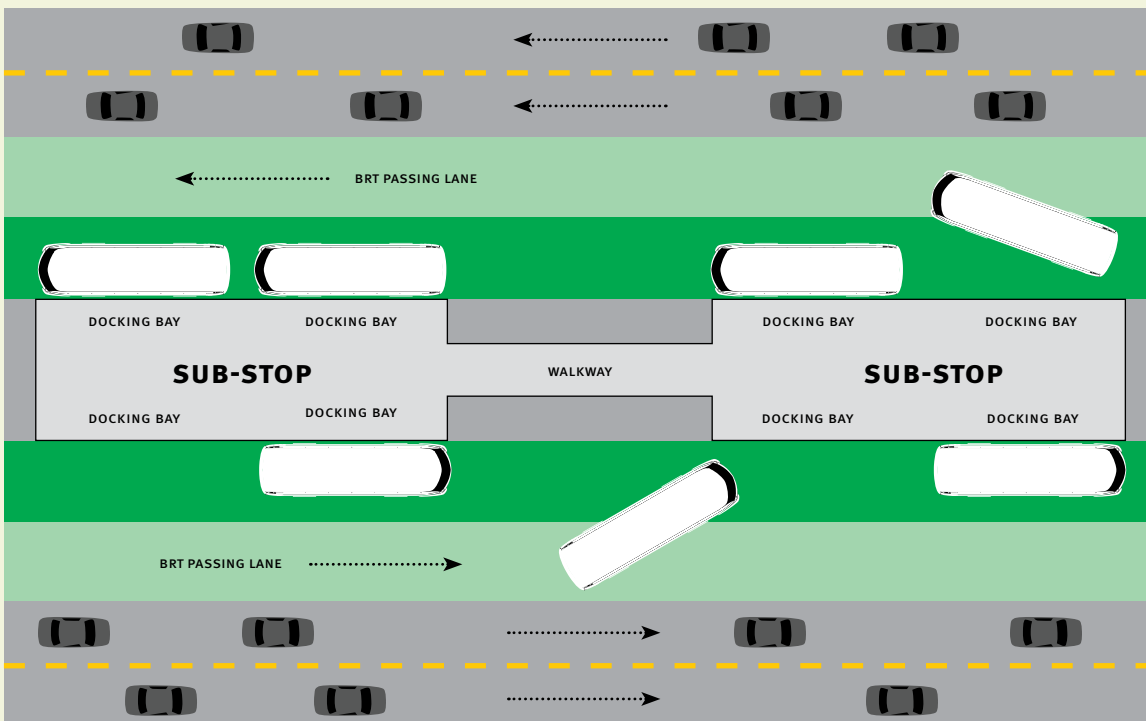
Multiple docking bays and sub-stops not only increase the capacity of a station, they help stations provide multiple services at the station as well.

A station is composed of sub-stops that can connect to one another but should be separated by a walkway long enough to allow buses to pass one sub-stop to dock at another. This reduces the risk of congestion by allowing a bus to pass a full sub-stop where buses can let passengers on and off. They are usually adjacent to each other and allow a second bus to pull up behind another bus already at the station. A station may be composed of only one sub-stop.

At minimum, a station needs one sub-stop and two docking bays. It is usually recommended that one sub-stop not have more than two docking bays, but at that point another sub-stop should be added. Multiple docking bays and sub-stops are important regardless of the level of ridership.

Docking Bays and Sub-stops	POINTS
At least two sub-stops or docking bays at the highest-demand stations	1
Less than two sub-stops or docking bays at the highest-demand stations	0

### Example of Sub-stops with Multiple Docking Bays







Lima, Peru has sliding doors where the bus docks at the station.

## Sliding Doors in BRT Stations

### 1 point maximum

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

Sliding Doors	POINTS
All stations have sliding doors	1
Otherwise	0



Guangzhou, China's BRT has sliding doors at the gates.

# Communications



Las Vegas, USA has a good brand and strong identity that appeals to its customers—from the stations to the buses.



Las Vegas, USA, used old casino signs at stations, which reinforced the city's identity.

## Branding

3 points maximum

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

Branding	POINTS
All buses, routes, and stations in corridor follow single unifying brand of entire BRT system	3
All buses, routes, and stations in corridor follow single unifying brand, but different from rest of the system	2
Some buses, routes, and stations in corridor follow single unifying brand, regardless of rest of the system	1
No corridor brand	0



# Passenger Information

2 points maximum

Numerous studies have shown that passenger satisfaction is linked to knowing when the next bus will arrive. Giving passengers information is critical to a positive overall experience.

Real-time passenger information 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 station and vehicle signage, including network maps, route maps, local area maps, emergency indications, and other user information.

Passenger Information (at Stations and on Vehicles)	POINTS
Functioning real-time and up-to-date static passenger information corridor-wide	2
Up-to-date static passenger information	1
Very poor or no passenger information	0



Guangzhou, China has real-time passenger information systems.

# Access and Integration

## Universal Access

3 points maximum

A BRT system should be accessible to all special-needs customers, including those who are physically, visually, and/or hearing-impaired, as well as those with temporary disabilities, the elderly, children, parents with strollers, and other load-carrying passengers.

**Scoring Guidelines:** Full accessibility means that all stations, vehicles, and fare gates on the corridor are universally accessible for wheelchairs. The corridor must also include drop curbs at all immediate intersections, Braille readers at all stations, and Tactile Ground Surface Indicators leading to all stations.

Universal Accessibility	POINTS
Full accessibility at <i>all</i> stations and on all vehicles	3
Partial accessibility at <i>all</i> stations and on all vehicles	2
Full or partial accessibility at <i>some</i> stations and on some vehicles	1
Corridor not universally accessible	0



Eugene, USA provides universal access for passengers.



# Integration with Other Public Transport

## 3 points maximum

When a BRT system is built in a city, a functioning public transport network often already exists, be it rail, bus, or minibus. The BRT system should integrate into the rest of the public transport network. There are two components to BRT integration:

- **Physical transfer points:** Physical transfer points should minimize walking between modes, be well-sized, and not require passengers to exit one system and enter another;
- **Fare payment:** The fare system should be integrated so that one fare card may be used for all modes.

**Scoring Guidelines:** The BRT corridor should integrate physically with other public transport modes where lines cross. If no lines cross, points may still be awarded for physical integration. If no other formal public transport modes exist in the city, full points may be awarded for all aspects of integration.

Integration with Other Public Transport	POINTS
Integration of both physical design and fare payment	3
Integration of physical design or fare payment only	2
No integration	0



Guangzhou, China has physical integration, like this tunnel connecting the BRT to the Metro.

# Pedestrian Access

## 3 points maximum

A BRT system could be extremely well-designed and functioning but if passengers cannot access it safely, it cannot achieve its goals. Good pedestrian access is imperative in BRT system design. Additionally, as a new BRT system is a good opportunity for street and public-space redesign, existing pedestrian environments along the corridor should be improved.

Good pedestrian access is defined as:

- At-grade pedestrian crossings where pedestrians cross a maximum of two lanes of traffic before reaching a pedestrian refuge (sidewalk, median);
- If crossing more than two lanes at once, a signalized crosswalk is provided;
- Well-lit crosswalks where the footpath remains level and continuous;
- While at-grade crossings are preferred, pedestrian bridges or underpasses with working escalators or elevators can also be considered;
- Sidewalks along corridor are at least 3 meters wide.

Pedestrian Access	POINTS
Good, safe pedestrian access at every station and for a 500-meter catchment area surrounding the corridor	3
Good, safe pedestrian access at every station and many improvements along corridor	2
Good, safe pedestrian access at every station and modest improvements along corridor	1
Not every station has good, safe pedestrian access and little improvement along corridor	0



Metrobus, in Mexico City, Mexico, provides good pedestrian access to stations.

# Secure Bicycle Parking

2 points maximum

The provision of bicycle parking at stations is necessary for passengers who wish to use bicycles as feeders to the BRT system. Formal bicycle parking facilities that are secure (either monitored by an attendant or observed by security camera) and weather-protected are more likely to be used by passengers.

Bicycle Parking	POINTS
Secure bicycle parking at least in terminal stations and standard bicycle racks elsewhere	2
Standard bicycle racks in most stations	1
Little or no bicycle parking	0



Secure bike parking is provided at a TransMilenio terminal in Bogotá, Colombia.



A bike locker along the Orange Line in Los Angeles, USA, provides secure bicycle storage.



# Bicycle Lanes

## 2 points maximum

Bicycle-lane networks integrated with the BRT corridor improve customer access, provide a full set of sustainable travel options, and enhance road safety.

Bicycle lanes should ideally connect major residential areas, commercial centers, schools, and business centers to nearby BRT stations to provide the widest access. All such major destinations within at least two kilometers of a corridor should be connected by a formal cycleway.

Moreover, in most cities, the best BRT corridors are also the most desirable bicycle routes, as they are often the routes with the greatest travel demand. Yet there is a shortage of safe cycling infrastructure on those same corridors. If some accommodation for cyclists is not made, it is possible that cyclists may use the busway. If the busway has not been designed for dual bike and bus use, it is a safety risk for cyclists. Bicycle lanes should be built either within the same corridor or on a nearby parallel street and should be at least 2 meters, for each direction, of unimpeded width.

Bicycle Lanes	POINTS
Bicycle lanes on or parallel to entire corridor	2
Bicycle lanes do not span entire corridor	1
No bicycle infrastructure	0



A bikeway is located parallel to MyCiTi, in Cape Town, South Africa.

# Bicycle-Sharing Integration

## 1 point maximum

Having the option to make short trips from the BRT corridor by a shared bicycle is important to providing connectivity to some destinations. Operating costs of providing bus service to the last mile (i.e., feeder buses) are often the highest cost of maintaining a BRT network; thus, providing a low-cost bicycle-sharing alternative to feeders is generally seen as best practice.

Bicycle-Sharing Integration	POINTS
Bicycle-sharing at minimum of 50% of stations on corridor	1
Bicycle-sharing at less than 50% of stations on corridor	0



A bike-share station is located along a BRT corridor in Nantes, France.

# Point Deductions

Point deductions are only relevant to systems already in operation. They have been introduced as a way of mitigating the risk of recognizing a system as high quality that has made significant design errors or has significant management and performance weaknesses not readily observable during the design phase. The penalties from improperly sizing the infrastructure and operations or from poor system management are as follows:

## Commercial Speeds

**-10 points maximum**

Most of the design features included in the scoring system will always result in higher speeds. However, there is an exception: higher-demand systems in which too many buses carrying too many passengers have been concentrated into a single lane. In this case, bus speeds could be lower than in mixed-traffic conditions. This penalty was imposed to mitigate the risk of rewarding such a system with a quality standard.

**Scoring Guidelines:** The minimum average commercial speed refers to the system-wide average speed and not the average speed at the slowest link. Where commercial speed is not readily available, the full penalty should be imposed if buses are backing up at many BRT stations or junctions.

Commercial Speeds	POINTS
Minimum average commercial speed is 20 kph (12 mph) and above	0
Minimum average commercial speed is 16 kph–19 kph (10–12 mph)	-3
Minimum average commercial speed is 13 kph–16 kph (8–10 mph)	-6
Minimum average commercial speed is 13 kph (8 mph) and below	-10



## Minimum Peak Passengers per Hour per Direction (pphpd) Below 1,000

**-5 points**

BRT systems with ridership levels below 1,000 passengers per hour per direction (pphpd) during the peak hour are carrying fewer passengers than a normal mixed-traffic lane. Very low ridership can be an indication that other bus services continue to operate in the corridor alongside, and competing with, the BRT system. Alternatively, it indicates that a corridor was poorly selected.

Almost all cities have corridors carrying at least 1,000 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. This penalty has been created to penalize systems that have done a poor job of service planning or corridor selection, while not overly penalizing smaller, car-oriented cities with low transit demand.

**Scoring Guidelines:** All five points should be deducted if the ridership on the link in the corridor with maximum peak-hour ridership is under 1,000 pphpd in the peak hour. Otherwise, no deduction is necessary.

Passengers per Hour per Direction (PPHPD) in Peak Hour	POINTS
PPHPD below 1,000	-5

## Lack of Enforcement of Right-of-Way

**-5 points maximum**

A BRT system may have a good alignment and physical separation, but if the right-of-way is not enforced, bus speeds will decline. This penalty addresses systems 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. The committee generally recommends on-board camera enforcement and regular policing at points of frequent encroachment, coupled with high fines for violators, to minimize invasions of the lanes by non-authorized vehicles. Camera enforcement at high-risk locations is somewhat less effective, however, when the selection of appropriate enforcement is left to local conditions.

Lack of Enforcement	POINTS
Regular encroachment on BRT right-of-way	-5
Some encroachment on BRT right-of-way	-3
Occasional encroachment on BRT right-of-way	-1

# Significant Gap Between Bus Floor and Station Platform

**-5 points maximum**

Even systems that have been designed to accommodate platform-level boarding could have gaps if the buses do not dock properly. A significant gap between the platform and the bus floor undermines the time-savings benefits of platform-level boarding and introduces a significant safety risk for passengers. Such gaps could occur for a variety of reasons, from poor basic design to poor driver training. Technical opinion varies on the best way to minimize the gap. Most experts feel that optical guidance systems are more expensive and less effective than measures such as the use of simple painted alignment markers and special curbs at station platforms where the drivers are able to feel the wheel touching the curb yet the curb does not damage the wheel. Boarding bridges are used successfully in many systems and would tend to eliminate gap problems.

Note: If a system does not have platform-level boarding by design, no penalty points should be given.

Gap Minimization	POINTS
Large gaps everywhere or kneeling buses required to minimize gaps	-5
Slight gap remaining at some stations, large gap at remaining stations	-4
Slight gap at most stations	-3
No gap at some stations, slight gap at remaining stations	-2
No gap at most stations, slight gap at remaining stations	-1

# Overcrowding

**-5 points**

This was included because many systems that are generally well-designed are so overcrowded that they become alienating to passengers. While average “passenger standing density” is a reasonable indicator, getting this information is not easy, so we have allowed a more subjective measure to be used in cases of obvious overcrowding.

**Scoring Guidelines:** The full penalty should be imposed if the average passenger density during the peak hour is greater than five passengers per square meter (0.46 per square ft.) on more than 25% of buses in the predominant direction, or the average passenger density during the peak hour is greater than three passengers per square meter (0.28 per square ft.) at stations.

If this metric is not easily calculated, then clearly visible signs of overcrowding on buses or in stations should be used, such as doors on the buses regularly being unable to close, stations overcrowded with passengers because they are unable to board full buses, etc.

Overcrowding	POINTS
Passenger density during peak hour on more than 25% of buses in peak direction is $> 5 \text{ m}^2$ , <b>OR</b> Passenger density during the peak hour at one or more stations is $> 3 \text{ m}^2$ , <b>OR</b> Passengers unable to board buses or enter stations	-5

# Poorly Maintained Busway, Buses, Stations, and Technology Systems

**-10 points maximum**

Even a BRT system that is well built and attractive can fall into disrepair. It is important that the busway, buses, stations, and technology systems be regularly maintained. A corridor can be penalized for each type of poor maintenance listed below for a total of -10 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	-2
Maintenance of Stations	POINTS
Stations have graffiti, litter, occupancy by vagrants or vendors, or structural damage	-2
Maintenance of Technology Systems	POINTS
Technology systems, including fare collection machines, are not functional	-2

# 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, passengers need to be confident that their wait times will be short and the next bus will arrive soon.

**Scoring Guidelines:** Peak frequency is measured by the number of buses observed per hour for each route that passes the highest-demand segment on the corridor during the peak period. The peak frequency deduction is then allocated based on the percentage of routes that have a frequency of at least eight buses per hour in the peak period. If observations are not able to be made, frequencies may be obtained through route schedules.

% Routes With At Least 8 Buses per Hour	POINTS
100% have at least 8 buses per hour	0
75% have at least 8 buses per hour	-1
50% have at least 8 buses per hour	-2
< 50% have at least 8 buses per hour	-3



# Low Off-Peak Frequency

**-2 points maximum**

As with peak frequency, how often the bus comes during off-peak travel times is a good proxy for quality of service.

**Scoring Guidelines:** Off-peak frequency is measured by the buses per hour of each route passing through the highest-demand segment on the corridor during the off-peak (mid-day) period. The off-peak frequency score is then determined based on the percentage of all routes that have a frequency of at least four buses per hour during the off-peak period.

% Routes With At Least 4 Buses per Hour	POINTS
100% of all routes have at least 4 buses per hour	0
60% of all routes have at least 4 buses per hour	-1
< 60% of all routes have at least 4 buses per hour	-2

# 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. 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 a preliminary concept of 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 system. These same criteria can be applied without modification to rail transit corridors to assess whether they meet a more general definition of rapid transit as well.

## 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. ITDP is engaging with rail transit experts who understand how railbed and tracks are designed for more guidance on this section. In the meantime, the evaluation of the railbed and tracks can be scored based on whether they are designed to a 30-year life span or not.

## Signaling

The distance between rail vehicles is largely governed by the type of signal system that is used. Better signals can allow for increased headways and improved service. Since BRT systems are not limited by signal systems, this is not a part of *The BRT Standard*. Ideally, to evaluate rail transit corridors, a separate section would be added to address signal systems. BRTs would automatically score maximum points in this section, since buses are not constrained by signaling systems and can operate at closer spacings than are permitted by most signal systems. ITDP is consulting rail experts to determine how this section might be developed. Until that work is completed, signaling considerations could simply be ignored, as the effects of low-quality signal systems are likely captured by some of the point deductions for operations (e.g., overcrowding).

## Elements Specific to BRT

Some elements of *The BRT Standard* are more common in BRT systems. For example, very few metro and light-rail systems offer express, limited, 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 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 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 gold standard.

# Notes





[www.itdp.org](http://www.itdp.org)



[www.rockefellerfoundation.org](http://www.rockefellerfoundation.org)



[www.barrfoundation.org](http://www.barrfoundation.org)



[www.climateworks.org](http://www.climateworks.org)



[www.gtz.de](http://www.gtz.de)



[www.theicct.org](http://www.theicct.org)



[www.unep.org](http://www.unep.org)

# BRT Standard Scorecard

## CATEGORY MAX SCORE

### BRT Basics (PP. 14–23)

Dedicated Right-of-Way	8
Busway Alignment	8
Off-board Fare Collection	8
Intersection Treatments	7
Platform-level Boarding	7

### Service Planning (PP. 24–30)

Multiple Routes	4
Express, Limited, and Local Services	3
Control Center	3
Located in Top Ten Corridors	2
Demand Profile	3
Hours of Operations	2
Multi-corridor Network	2

### Infrastructure (PP. 31–36)

Passing Lanes at Stations	4
Minimizing Bus Emissions	3
Stations Set Back from Intersections	3
Center Stations	2
Pavement Quality	2

### Stations (PP. 37–41)

Distances Between Stations	2
Safe and Comfortable Stations	3
Number of Doors on Bus	3
Docking Bays and Sub-stops	1
Sliding Doors in BRT Stations	1

## CATEGORY MAX SCORE

### Communications (PP. 42–43)

Branding	3
Passenger Information	2

### Access and Integration (PP. 44–49)

Universal Access	3
Integration with Other Public Transport	3
Pedestrian Access	3
Secure Bicycle Parking	2
Bicycle Lanes	2
Bicycle-sharing Integration	1

### Point Deductions (PP. 50–54)

Commercial Speeds	-10
Minimum Peak Passengers per Hour per Direction (pphpd) Below 1,000	-5
Lack of Enforcement of Right-of-Way	-5
Significant Gap Between Bus Floor and Station Platform	-5
Overcrowding	-5
Poorly Maintained Busway, Buses, Stations, and Technology Systems	-10
Low Peak Frequency	-3
Low Off-peak Frequency	-2

### Minimum Requirements for a Corridor to be Considered BRT

1. At least 3km length with dedicated lanes
2. Score 4 or more points in dedicated right-of-way element
3. Score 4 or more points in busway alignment element
4. Score 20 or more points across all five BRT Basics elements



**BRONZE**  
55–69 points



**SILVER**  
70–84 points



**GOLD**  
85–100 points