Climate Bond Certified

Bus Rapid Transit (BRT) Systems

Eligibility Criteria and Guidelines

CRITERIA – December 2014

The following criteria applies to Part B – Low Carbon Criteria, under clauses 8 [Eligible projects and physical assets] and clause 9 [Technical criteria] of the Climate Bond Standard version 1.0.

For a bond to be certified as a Climate Bond, the funds raised under it must be used to finance or re-finance:

Bus Rapid Transit (BRT) Systems– that is, components of any BRT project meeting Bronze, Silver or Gold score under the BRT Standard*, as developed by the Institute of Transportation and Development Policy, will be eligible for certification under the Climate Bonds Standard.

*Refer to guidelines below for minimum performance requirement.

Rationale

High quality BRT has been shown to be associated with the improvement of bus travel speeds and reliability and the smoothing of traffic flows, leading to greater mode shifting and reduced greenhouse gas (GHG) emissions. Lower quality bus improvements that provide only Basic BRT or less tend to result in lower bus speeds, reduced reliability of service, less mode shifting, and minimal GHG emission reduction compared with business as usual.

The 2014 BRT Standard, attached as Annex 1, has been developed as a simple system for appraising the design quality and operational functionality of BRT systems, and is a good surrogate for GHG benefits of BRT.

The *Bus Rapid Transit (BRT) Standard* was developed by the Institute for Transportation and Development Policy in 2010 to establish a common definition of BRT, which was needed in response to modest improvements to bus service being inaccurately labeled as BRT. This trend degraded the definition of BRT, particularly as a rapid service. The BRT Standard was also designed to provide a means of recognizing the best BRT systems (Gold, Silver, and Bronze)—those featuring designs that combine efficiency and sustainability with passenger comfort and convenience. By scoring the level of quality, it is easier to predict a system's ability to attract new riders and reduce bus delays, results which directly affect a system's impact on greenhouse gas emissions.

The BRT Standard was developed by a committee composed of the world's leading BRT experts. The Standard was designed to evaluate systems based on multiple design elements. These elements are generally easily recognizable and simple to score without a massive data collection process. This evaluation method celebrates high-quality BRTs but is not intended to denigrate lighter BRT improvements, or even improvements to conventional bus systems, that may also yield important benefits to customers.

Other Bus System Improvements. Bus system improvements that fall short of high quality BRT may or may not produce meaningful reduction of greenhouse gas emissions. The impact is highly context specific and difficult to evaluate; therefore consideration has been delayed until 2016.

Annex 1: The BRT Standard 2014

Introduction

The BRT Standard is an evaluation tool for world-class bus rapid transit based on international best practices. It is also the centerpiece of a global effort by leaders in bus transportation design to establish a common definition of bus rapid transit (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 laying out the essential elements of BRT corridors, 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 on BRT excellence and offers best practice-based guidance to those in the process of 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. These 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. Our hope is that this will bring about the fundamental change needed to shift people out of their cars towards modern and sustainable BRT.

Why was *The BRT Standard* created?

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 has been no common understanding of what constitutes BRT. The lack of a common definition has caused confusion about the concept. The absence of an agreement among planners and engineers has 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 has made it possible for modest bus system improvements to be branded as BRT, leading to some backlash about 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 disbursed 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 not only ensures 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 is BRT 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?

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

Trunk Corridor Definition

The definition of a BRT trunk corridor has been changed from 4 kilometers (km) in length down to 3 km. This was done to allow BRT systems in downtown areas to be considered BRT. These systems can provide valuable service 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 penalty for low peak and off-peak frequencies. This was done since the provision of route frequencies was seen as more of an operational decision, rather than a design decision.

Emphasis on Basics

Five additional points were added to the five BRT Basics categories, creating a greater emphasis on the basic elements of BRT. The scoring of the Basic categories has been reconfigured alongside the additional points.

The BRT Standard 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), a member of the Best Practice Network of the ClimateWorks Foundation.

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 a dedication to its contribution for social and economic development.

They establish the strategic direction, 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:

- ClimateWorks Foundation
- Gesellschaft für Internationale Zusammenarbeit (GIZ)
- Institute for Transportation and Development Policy (convener)
- International Council on Clean Transportation (ICCT)
- Rockefeller Foundation

The BRT Standard Scorecard

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 only awarded for those 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 their relative importance.
- 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 is not readily obtained.

The maximum number of points a system can earn is 100. Below is an overview of the four *BRT Standard* point categories. Bronze, silver and gold all reflect well-designed corridors that have achieved excellence. A lower score could reflect that more significant measures were not justified in a particular case.

BRT Standard 2014 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 in operational performance and efficiency, while providing a high quality of service. It is achievable on any corridor with sufficient demand to justify any 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: 20–55 Points

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

Design versus Performance

The BRT Standard relies on observable corridor 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:

- <u>The ability to assess both planned and existing corridors</u>: *The BRT Standard* is 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.
- <u>Good data is rare and expensive:</u> 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 either under-spending on the capital investments that would actually increase operating costs or it could result in 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 members of the Technical Committee over the course of the year and their scores will be submitted to *The BRT Standard* Technical Committee to certify at the end of each year. Only corridors that have not previously been scored will be eligible for scoring; those corridors previously scored may request to be re-scored. In addition, the Technical Committee may request that a corridor be rescored if it has experienced significant design changes or operational difficulties. When the new score is released, the justification for rescoring the corridor will also be included.

Scores will be released in the first quarter of the following year and used as a means to compare and celebrate those 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.

Definition of a BRT Trunk Corridor

The BRT Standard is to be applied to specific BRT trunk 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 trunk corridor is defined as follows:

"**A section of a road or contiguous roads served by a bus route or multiple bus routes that have dedicated lanes with a minimum length of 3 kilometers**"

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. In order 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. The five essential elements of BRT are:

Busway alignment: 8 points*

Dedicated right-of-way: 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 four (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. These five elements eliminate 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.

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.

Enforcement of the dedicated lanes can be handled 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.

Delineators are road markers that define the busway, and need enforcement to be effective.

BRT Basics: This is an element of BRT deemed as essential to true BRT corridors. A minimum score of 4 must be achieved on this element 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 placement of that dedication 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

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, 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 obstructions.

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

Segments including bridges, tunnels, expressways, or non-built up areas, which don't impede the efficiency of the system, are not factored into the corridor score.

Trunk Corridor Configurations	**Points**
Tier 1 Configurations	
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
Tier 2 Configurations	
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
Tier 3 Configurations	
Virtual busway that operates bi-directionally in a single median lane that alternates direction by block (see Figure XX).	1

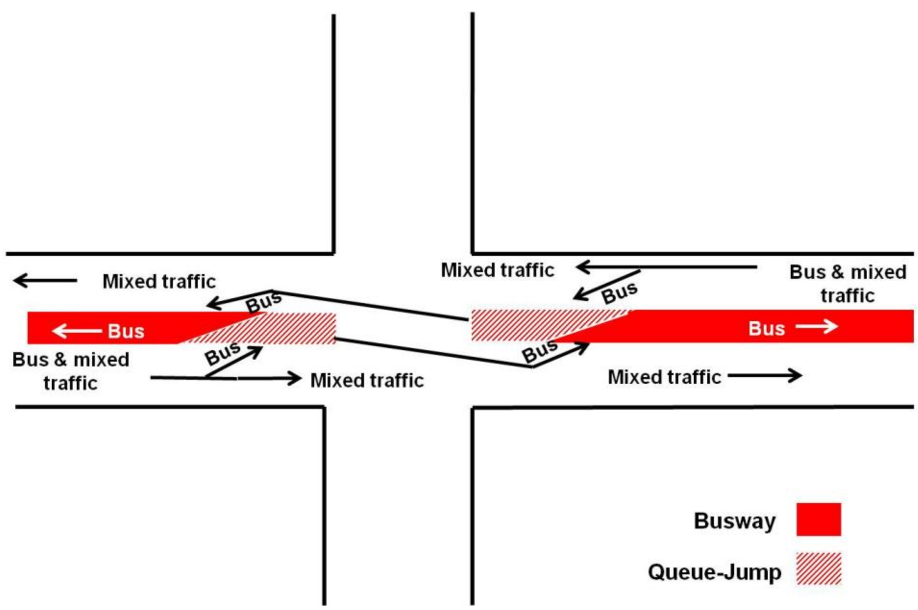

Figure XX: Virtual busways can be utilized in restricted or narrow road widths to provide dedicated right of way for

BRT. A virtual busway is a single bus lane in the middle of a roadway, which 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.

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: "Barrier-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 which is then checked on board the vehicle by an inspector. Both approaches can significantly reduce delay. However, barrier-controlled is slightly preferred because:

- It is somewhat 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 barrier-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 trunk BRT corridors extend the benefits of time savings to those sections of the bus routes that lie beyond the BRT trunk corridor.

BRT Basics: This is an element of BRT deemed as 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 trunk stations have barrier-controlled, off-vehicle fare collection	8
100% of routes that touch the trunk corridor have proof-of-payment	7
80% of trunk stations have barrier-controlled, off-vehicle fare collection	7
80% of routes that touch the trunk corridor have proof-of-payment	6
60% of trunk stations have barrier-controlled, off-vehicle fare collection	6
60% of routes that touch the trunk corridor have proof-of-payment	5
40% of trunk stations have barrier-controlled, off-vehicle fare collection	5
40% of routes that touch the trunk corridor have proof-of-payment	4
20% of trunk stations have barrier-controlled, off-vehicle fare collection	3
20% of routes that touch the trunk corridor have proof-of-payment	2
< 20% of trunk stations have barrier-controlled, off-vehicle fare collection <20% of routes that touch the trunk corridor have proof-of-payment	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.

BRT Basics: This is an element of BRT deemed as 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 mostintersections	2
No turns prohibited across the busway but some intersections have signal priority	1
No intersection treatments	0

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 steps, 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 is 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. This 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 trunk line, 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 mulitple routes	0

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 *and* one limited or express service option	2
No limited or express services	0

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, if it exists, 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

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 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 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 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.

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

[ADD VISUAL DIAGRAMS TO HELP EXPLAIN THIS SECTION]

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 ser-vice, no late-nights	1
No late-night or weekend service	0

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 either through BRT services or infrastructure.

Multi-corridor Network	**Points**
BRT connects to an existing BRT corridor or to the next corridor planned in the network	2
BRT connects to a 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

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. Moreover, "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_2 impacts, we recommend the use of the TEEMP model which incorporates the BRT Standard into a broader assessment of project-specific CO_2 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, but ideally 40, meters 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 trunk stations are set back at least 40 m (120 ft.) from intersection or meet at least one of the following exemptions: • Fully exclusive busways with no intersections • Stations located near intersections due to block length (such as downtowns where blocks are relatively short)	3
75% of trunk stations are set back 26m (85 ft) from intersections or meet above exemptions	2
25% of trunk stations are set back 26m (85 ft) from intersections or meet above exemptions	1
< 25% of trunk stations are set back 26m (85 ft) from intersections or meet above exemptions	0

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—in which each station houses a particular direction of the BRT system. If a 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.

Center Stations	Points
80% and above of trunk stations have center platforms serving both directions of service	2
50% of trunk stations	1
< 20% of trunk stations	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 lifespan 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+ years with surface replacement every 10 -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+ 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 (CRCR): 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

STATION DESIGN AND STATION-BUS INTERFACE

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.) between stations. 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 distances between stations should not exceed 0.8 km (0.5 mi.), and should not be below 0.3 km (0.2 mi.).

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

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

Scoring Guidelines:

Stations should have at least 3.0 m (10.5 ft.) of internal width. This is the definition for “wide” in the scoring chart below.

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

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 in order to let higher volumes people on and off the buses. One door or narrow doorways become bottlenecks that delay the bus.

Scoring Guidelines:

Buses need to have 3 or more doors on the station side of the bus for articulated buses or two wide doors on the station side of the bus 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

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, and prevent pedestrians from entering the station in unauthorized locations.

Sliding Doors	Points
All stations have sliding doors	1
Otherwise	0

QUALITY OF SERVICE AND PASSENGER INFORMATION SYSTEMS

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	1

of rest of the system	
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

INTEGRATION AND ACCESS

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 trunk stations, vehicles, and fare gates are universally accessible for wheelchairs. System includes 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 *all* stations and vehicles	3
Partial accessibility at *all* stations and vehicles	2
Full or partial accessibility at *some* stations and vehicles	1
Corridor not universally accessible	0

Integration with Other Public Transport: 3 points maximum

Often, when a BRT system is built in a city, a functioning public transport network 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.

Information integration is also important and should undergird all other forms of integration.

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

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

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 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

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 in order to provide the widest access. All such major destinations within at least two kilometers of a trunk corridor should be connected by a formal cycle way.

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 are at least 2m, 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

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 50% of trunk stations minimum	1
Bicycle-sharing at less than 50% of trunk stations	0

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. To mitigate the risk of rewarding such a system with a quality standard, this penalty was imposed

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 and above	0
Minimum average commercial speed is 16 kph – 19 kph	-3
Minimum average commercial speed is 14 kph – 16 kph	-6
Minimum average commercial speed is 14 kph 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 along side, 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 which 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 in peak hour	-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, 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
No gap at all stations	0

Overcrowding: -5 points maximum

This was included because many systems which 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 m^2, OR Passenger density during the peak hour at one or more stations is > 3 m^2, OR 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 Buses and Stations	Points
Busway has significant wear, including potholes, warping, trash, debris, snow	-4
Buses have graffiti, litter, seats in disrepair	-2
Stations have graffiti, litter, occupancy by vagrants or vendors, or have structural damage	-2

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. In order 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

Using the BRT Standard to Evaluate Rail Transit 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 being called BRT. These elements all aim to minimize vehicle 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 the busway, 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 trunk 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 rail is designed for more guidance on this section. In the mean time, the evaluation of the railbed and tracks can be scored based on whether they are designed to a 30 year lifespan 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. To evaluate rail transit corridors, ideally, a separate section would be added to address signal systems, with BRTs automatically scoring maximum points. ITDP is consulting rail experts as to 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 (overcrowding) are likely captured by some of the point deductions for operations.

Elements Specific to BRT

Some elements of the BRT Standard are more exclusive to 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 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.