



# The Development of Bus Rapid Transit in Latin America: A review

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**Abstract:** Urban mobility is a challenge worldwide due to the increasing of people living in cities. In developing countries, this challenge raises due to the absence of enough capital to invest in rail-road systems such as metros, trains, and light rail services. In this sense, Bus Rapid Transit (BRT) was developed in Latin America as an alternative to low-cost great capacity transportation to those systems. The objective of this paper is to explore system development in the region and to identify if the main current BRTs really bring advantages to the cities in terms of urban mobility. To perform the article, we conducted a literature review and compared five main BRT systems in the region considering the passenger volume, and extension in km using data from Global BRT data. The results suggest that BRT systems have been producing efficient urban mobility in cities such as Rio de Janeiro, Sao Paulo, Bogota, and Mexico City.

**Keywords:** BRT; urban mobility; passenger transport; public transport.

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## 1. Introduction

Bus Rapid Transit (BRT) is considered an economical solution to improve urban mobility in cities [1,2]. A BRT system requires exclusive lanes, fare collection outside of the buses, buses with high capacity, comfort, traveler information, and advanced transportation system technologies [2,3].

The experience of BRT in Curitiba, Brazil, and Bogotá, Colombia has boosted the introduction of the system worldwide [3]. However, given the difference of the characteristics of traffic environments in developed and developing countries is important to analyze BRT development in a developing country.

Latin America is composed of countries in the developing stage and suffers from a poor transport infrastructure and low capacity of investments in passenger transport. At the same time, there are many populous cities and their inhabitants have been suffering to attend to their need for displacement.

In this sense, BRT was developed as an alternative to mass transport systems such as subways and trains using long bus vehicles. Originally, implemented in the 1980s in Curitiba [1] the system spread to other Brazilian and Foreign cities where the Bogotá system, Transmilenio obtained enormous highlights.

Nevertheless, how this kind of transport system has been effective in Latin American cities? To start to explore the current situation of BRT in Latin America this paper investigates the actual scenario and analyzes which are the main system in operation in Latin America nowadays.

## 2. Methodology

The methodology of this paper consists of in to analyze the current stage of BRT's available services in Latin America. To do so, we collected data from the Global BRT Data [4] that compiles information on all BRT systems in operation worldwide.

The five most important services in two different categories: numbers of passengers, and extension in km were selected in a put-in order. The organized lists were prepared in Tables and cities were ranked. In the next section, we discuss some of the reasons regarding the rank obtained.

## 3. Results and Discussion

BRT is the highest level of prioritization in the bus system [5] and is nowadays presented in 13 countries and 67 cities where Brazil (27), Mexico (12), Colombia (7), and Argentina (5) are the countries that more implemented BRT systems [4]. BRT reduces the social and operational costs of the public transport system compared to using buses in mixed traffic [6].

Brazil for obvious reasons – to be a berth of BRT development – is ahead in the number of the systems, mostly implemented since the 2000s along with transport projects to meet the demands of the 2014 FIFA World Cup [7]. However, Colombian systems obtained more relevance worldwide as a model of a transport system, mainly with TransMilenio, the most prominent BRT project implemented in the year 2000.

The ranking of the biggest BRT services in Latin America in number of passengers can be seen in Table 1.

**Table 1.** Ranking of cities in Latin America with the biggest BRT systems in Transport Passengers. Source: [4]

Country	Cidade	Number of Passengers/day
Brazil	Rio de Janeiro	3.535.466
Colombia	Bogotá	2.192.009
Brazil	São Paulo	1.388.463
Mexico	Mexico City	1.240.000
Ecuador	Quito	745.000

Among the five BRT systems more movement daily, Brazil has two of them Rio de Janeiro, developed during the preparations to organize the Fifa World Cup 2014 and the Olympics 2016 [8]. If considered Curitiba, the pioneer and out of the list because is the sixth most movement with 721.000 [8], the BRT service remains connected to the Brazilian origin. Bogotá inspired by Curitiba BRT service is the second place regarding the movement of passengers. Before the pandemic, the TransMilenio system carried up to 45,000 passengers/hour/direction, however, historically the system has had overcrowding levels [9]. There are also reports of overcrowding and queues in other systems in Latin America such as Lima (Peru), Montevideo (Uruguay), and Cali (Colombia) [6].

The new implementations developed fast as the Mexico City system was established in 2005 and ranked in fourth place in the list [4]. In this rank, three cities are the capitals of their countries and all of them are high populous cities that influence this indicator, Table 2.

The biggest BRT services in Latin America in extension in km can be seen in Table 3.

**Table 2.** Inhabitants in selected cities. Source: [4]

Country	Cidade	Inhabitants
Brazil	Rio de Janeiro	6.476.631
Colombia	Bogotá	8.181.047
Brazil	São Paulo	12.252.023
Mexico	Mexico City	8.851.080
Ecuador	Quito	1.619.791

**Table 3.** Ranking of cities in Latin America with the biggest BRT systems in Extension in km. Source: [4]

Country	Cidade	Extension in Km
Brazil	Rio de Janeiro	168
Mexico	Mexico City	140
Brazil	São Paulo	131
Colombia	Bogotá	113
Chile	Santiago	90

Also, regarding distance Rio de Janeiro appears in first place confirming that the city retains currently the most important service of BRT in Latin America. Rio de Janeiro's BRT has three corridors, Transoeste, Transcarioca, and Transolimpica, and a fleet of 427 buses, with the complete network expected to be delivered in 2024 with the inauguration of the Transbrasil corridor, the system will reach 140 stations, 15 terminals, and 600 buses [10]

Mexico City now is second in the list with an impressive 140 km of extension justifying that not necessarily one of the youngest services is small compared to others. Mexico City's Metrobus is the largest BRT system in the country and is well-connected with public buses, which transport 12 million passengers per day, and with the subway, which transports 4.4 million passengers per day [11].

Despite excellent mass transport systems, there are some considerations regarding the service where users complain about the quality of service offered mainly due to the s overcrowded services in peak time [8]. Basso et al [6] affirm that the BRTs were victims of their success, causing these queues and overcrowding to be a consequence of cars leaving circulation, due to people starting to use BRTs, as travel times become faster.

The same scenario can be observed in the service systems of the research. Therefore, we believe that the next step for BRT systems should be to find solutions to mitigate those problems.

#### 4. Conclusion

This study investigated the BRT systems in Latin America considering the number of passengers and extension in km using data from Global BRT Data. The results indicated that Rio de Janeiro is the most important BRT service nowadays in Latin America despite Bogota, Colombia, and Curitiba, Brazil referencing BRT transport systems.

Sao Paulo appeared as the second most representative system; however, it is necessary to emphasize that the system is fragmented, and many corridors allow the traffic of standard buses and taxis that go against the context of BRT systems of using segregated corridors and payment outside of the bus. This result indicates the necessity to review some parameters in Global BRT Data analysis.

The limitation of this study is related to the analysis being concentrated on data organization and some further analysis using statistics or other analysis tools can be necessary.

However, this fact does not invalidate the proposal of the paper to investigate the current scenario of BRT in Latin America.

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