Bus Rapid Transit in Latin America

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Mass Transit is a key tool to face growing congestion
BRT

“flexible, rubber-tired form of rapid transit that combines stations, vehicles, services, running ways and information technologies into an integrated system with strong identity” (TCRP, Levinson et. al, 2003b)
Key BRT Components

- Segregated Busways
- Stations with prepayment and level boarding
- Centralized Control
- Distinctive Image
- Large buses with multiple doors

Macrobús – Guadalajara, México
Multiple Applications around the world both in developing and developed countries

Intelligent Transportation Systems (ITS), operation management tools

Identity of the BHLS scheme

Vehicles

Running ways

Stations
Guangzhou 2010

- Centralized Control
- Distinctive Image
- Segregated Busways
- Stations with prepayment and level boarding
- Large buses with multiple doors
Bus priority systems in the world

# of cities and length (km) per country

181 cities = 368 corridors = 4,675 km

source: BRTdata.org, August 2014
Bus priority systems in the world

- USA and Canada: 2 countries, 26 cities, 39 corridors, 0.89 M pax/day, 807 km
- Europe: 13 countries, 50 cities, 65 corridors, 1.79 M pax/day, 812 km
- Asia: 10 countries, 37 cities, 70 corridors, 8.48 M pax/day, 1,308 km
- Africa: 2 countries, 3 cities, 4 corridors, 0.24 M pax/day, 81 km
- Latin America and the Caribbean: 11 countries, 59 cities, 182 corridors, 19.17 M pax/day, 1,633 km
- Oceania: 2 countries, 6 cities, 8 corridors, 0.43 M pax/day, 101 km

Daily demand per region adds up to 31 M pax/day

Source: BRTdata.org, August 2014
BRT and busway systems in the world

- evolution of the # of cities and km per decade

Before 1990 (20 cities):
- Total length: 507 km

1991 - 2000 (19 cities):
- Total length: 1025 km

2001 - 2010 (103 cities):
- Total length: 3707 km

Since 2011 (39 cities):
- Total length: 3911 km

Source: BRTdata.org, August, 2014
Bus priority systems in the world

Evolution of the number of cities per year

- 1968: Liège
- 1972/2010*: Lima
- 1974/1991*: Curitiba
- 2000: Bogotá (TransMilenio)
- 2010: Guangzhou

Cumulative Number of Cities

* Busway / BRT year commencement

source: BRTdata.org, August 2014
New BRTS 2012-2014 in Latin America

- **México City**
  - Lines 4-5

- **Bogotá, Colombia**
  - Phase III & Soacha

- **Buenos Aires, Argentina**
  - Metrobús

- **Rio de Janeiro**
  - Transoeste-Transcarioca

- **Belo Horizonte**
  - MOVE

- **Brasilia**
  - Expresso DF
Mexico City:
20 032 000 inhabitants    9 800 people/km²

http://www.mexicomexico.org/Tenoch/EvolTenoch/images/Mexico2006.jpg
México City
Metrobús
7 years, 105 km
650,000 pax/day

http://www.metrobus.df.gob.mx/mapa.html
Metrobús Line 4

- April 2012
- 28 km (2 roads bidirectional)
- 32 stops
- 2 terminals
- 2 airport stops
- 54 Euro V 12m buses (8 hybrid diesel-electric)
- Integrated electronic fare collection (on board)
Metrobus Line 5 – November 2013

10 Km
16 Stations
2 Terminals
55,000 passengers/day

Connection with
Metro Lines 1, 5 y B
Corredor Reforma (Buses)
Intercity Terminal (West)

http://www.metrobus.df.gob.mx/fichas.html#cinco
20 km

In Construction
145,000 pax/day (e)

http://www.metrobus.df.gob.mx/L6_previo.html#proyecto
Things done well

- Adaptive design to historic district conditions, complete streets
- Advanced vehicles
- New connections - mass transit corridors (BRT, Metro) and the airport – farecard integration
- Continued expansion

Required improvements

- User information
- Reliability
- Pedestrian safety
Bogotá, Colombia
9 009 000 inhabitants  21 700 people/km²
TransMilenio Very High Capacity & Flexible Transit System Using Buses
TransMilenio, Bogotá
112 km, 2,3 million pax/day (Sept 2014)

http://www.transmilenio.gov.co/es/plano-de-estaciones
TransMilenio, Bogotá
Phase III (June 2012)

http://www.transmilenio.gov.co/es/plano-de-estaciones

+20 Km
Phase III TransMilenio, Bogotá
20 km, +520,000 pax/day (June 2012)

Eldorado Trunkway
- 12.2 km
- 1 Terminal Station
- 1 Integration Station
- 12 intermediate Stations
- 1 depot
- Pedestrian overpass access, 1 pedestrian tunnels

Carrera 10ª Trunkway
- 7.7 km
- 1 Terminal Station
- 2 Integration Stations
- 8 Intermediate Stations
- 1 depot
- 2 pedestrian tunnels
- At grade pedestrian access
Troncal Calle 26 - Station
Portal del 20 de Julio
Terminal Station

http://www.elespectador.com/files/images/201105/7604fe3c744b9c4347f087bdc4a04dd6.jpg

Central Station
Urban Renewal Project
(under construction)

http://www.uru.gov.co/contenido/articulo/247-estacion-central
TransMilenio, Bogotá
Soacha Extension, 150,000 pax/day (Dec 2013)

http://www.transmilenio.gov.co/es/plano-de-estaciones
TransMilenio empieza a cambiarle la cara al municipio de Soacha

Por: REDACCIÓN CUNDINAMARCA | 6:57 p.m. | 28 de Diciembre del 2013

Trancones monumentales se viven en la autopista Sur.

Foto: Abel Cardenas / EL TIEMPO


December 2013
TransMilenio, Bogotá
Bus Priority (November 2013)

http://www.transmilenio.gov.co/es/plano-de-estaciones
200 Hybrid Diesel Electric Buses
5 Routes combining BRT, priority lanes and general traffic
Phase III TransMilenio & Soacha Extension + Dual Buses, Bogotá

- A component of the integrated mass transit system (SITP) – 60% Implemented
- Belated, 6 years
- High occupancy in Phases I and II – Need to improve quality
- High flexibility of new fleet of 12 m hybrid Diesel-Electric buses, operating on-off BRT corridors
- 43 km BRT expansion planned 2015-2017 (+Metro + Light Rail Transit + Cables)
Buenos Aires, Argentina:
13 776 000 inhabitants    5 200 people/km²
Metrobús - Buenos Aires

3 Corridors

39 Km

74 Stations

35 Bus Lines (Routes)

522,000 passengers per day

Open System

Rio de Janeiro, Brazil:
11,616,000 inhabitants    5,700 people/km²
Rio de Janeiro
150 km planned 2012-2016
Photo: EMBARQ Brasil
Transoeste Ligerão

**Initial operation**
- May 2012
- 40 km of which 32 km segregated median busways
- 29 stations, 2 terminals
- 65 articulated buses
- 55,000 pax/day
- R$ 2,75 (USD 1,36) per trip

**Full Project**
- 56 km of which 48 km segregated median busways
- 55 stations, 3 terminals
- 91 articulated buses
- 110,000 pax/day by the end of 2012
- 220,000 pax/day when connected to Metro in 2016
- 31 feeder routes, 147 feeder buses
- Capital investment R$ 1,6 bilion (USD 800 million)
Photo: EMBARQ Brasil
Rio de Janeiro
150 km planned 2012-2016
Transcarioca Rio de Janeiro 2014

Transcarioca, Río de Janeiro

- 39 km
- 45 Stations
- 1 June, 2014 (for the FIFA World Cup)
- 450,000 passengers per day

https://www.youtube.com/watch?v=zyotKCW8iH8
O BRT vai passar pela Avenida Brasil, Avenida Presidente Vargas, Primeiro de Março e Avenida Antônio Carlos, com estação terminal no aeroporto Santos Dumont, onde terá integração com VLT (Veículo Leve sobre Trilhos)

- 28 estações, sendo 14 centrais com acesso por passarelas.
- 30 mil metros quadrados de pontes e viadutos.
- Construção de um viaduto de 500 metros ligando Deodoro (estação terminal ao lado da linha férrea) até a Avenida Brasil.

http://thecityfixbrasil.com/files/2013/04/brt-transbrasil.png
Belo Horizonte, Brazil:
5 582 000 inhabitants   5 100 people/km²
BRTS Brazil

➢ In rapid expansion – national support
➢ Impressive time savings (congested environment)
➢ High occupancy
➢ Jaywaking – Run overs (road safety issues)
The new BRTS in Latin America:

- Examples of the leadership of Latin American countries in BRT applications
- High capacity, low cost, rapid implementation
- Part of large scale integrated systems
- Adapting new technologies (vehicles and ITS)
- Land use integration (following TOD experience in Curitiba)
- Some issues outstanding: reliability, occupancy
Versions in
English
Spanish
Portuguese

Get involved!

Traffic Safety on Bus Corridors
Guidelines for integrating pedestrian and traffic safety into the planning, design, and operation of BRT, Busways and bus lanes

Pilot Version - Road Test

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