Bus Rapid Transit Worldwide

From Quantity to Quality

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Observer Research Foundation
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Sustainable Urban Transport

Pedestrian and Bicycles

Public Transportation

Transit Oriented Development

Disincentives to Car Use

Bycicle Tracks and Pedestrian Facilities – Delhi BRT Corridor
What is a Bus Rapid Transit system?

“Is a flexible, rubber-tired form of rapid transit that combines stations, vehicles, services, running ways and ITS elements into an integrated system with strong identity”

“It is a high quality public transport system, oriented to the user that offers fast, comfortable and low cost urban mobility”
*BRT Planning Guide – ITDP, 2007*
About 68 systems in developed and developing countries

- USA-Canada: 11
- Latin America: 15
- Europe: 20
- Africa: 2
- Asia: 16
- Australia-New Zealand: 4
Bus Rapid Transit (BRT)

- Centralized Control
- Large Buses Multiple Wide Doors
- Distinctive Image
- Stations with Prepayment and Level Boarding
- Segregated Median Busways
Examples from Latin America
Curitiba, RIT, 72 km median busways
1.2 million pax/day
Initial Corridor 1974
Quito, Metrobús-Q, 37 Km median busways, 440,000 pax/day
Initial corridor in 1995
Bogotá, TransMilenio, 84 Km median busways, 1.6 million pax/day
Initial Corridor 2000
Expressway Lanes
TransMilenio, Bogota
Sao Paulo, 104 Km median busways + preferential buslanes, 5,761,000 pax/day
Initial busways 1980, Reconstructed in 2003
León de Guanajuato, México, Optibús, 25 Km median busways (60% segregated)
Initial corridor 2003
México City, Metrobús, 30 Km median busways, 450,000 pax/day
Initial Corridor 2005
Pereira, Colombia, Megabús, 27 Km Busways, 155,000 pax/day
Initial Operation in 2006
Pereira, Colombia

Photos courtesy of Megabus, Pereira, Colombia
Guayaquil, Ecuador,
Metrovía,
16 Km Busways,
96,000 pax/day
Initial Corridor 2006
Santiago, Chile, 19 Km busways + 63 Km of road improvements, Integrated Network for 5 Million Trips/day Initial Operation in 2007
Macrobús Guadalajara, Mexico
BRT in Asia
Taipei Busways (1996)

Photos: Jason Chang

http://ce11012.ce.ntu.edu.tw/paper%5CBeijing%20skchang.pdf
Taipei Busways

- Initial Operation: 1996
- Length: 30.3 Km 10 busways (avg 3.03 Km)
- Stations: 143 bus stops
- Ridership: 1,680,000 pax/day (total bus ridership 2003); ~10,000 pphpd
- Frequency: 144 buses/hr
- Commercial Speed: 14 Km/hr (peak)
Kumming Busway (1999)

Photo: Duan Xiaomei - GMTDC
Kumming Busway

- Initial Operation: 1999
- Length: 46.7 Km busway
- Stations: 63 bus stops
- Ridership: 156,000 pax/day (w/o 14.5 Km extension); 8,600 pphpd
- Frequency: 140 buses/hr
- Commercial Speed: 11-14 Km/hr

Beijing BRT Line 1

- Initial Operation: 2004
- Length: 16 Km (14 Km segregated)
- Stations: 18
- Ridership: 120,000 pax/day; 8,000 pphpd
- Frequency: 55 buses/hr
- Commercial Speed: 21 Km/hr

## Hangzhou BRT

- **Initial Operation:** 2006
- **Length:** 27.2 Km (7 Km busway)
- **Stations:** 17
- **Ridership:** 40,000 pax/day; 1,500 pphpd
- **Frequency:** 40 buses/hr (15 BRT buses/hr)
- **Commercial Speed:** 15 Km/hr (center, 25+ outside center)

Beijing BRT Lines 2 and 3

- Initial Operation: 2008
- Length: 39 Km (23 Km segregated)
- Stations: 43
- Ridership: N/A; 2,000 pphpd
- Frequency: 20 buses/hr
- Commercial Speed: 16-19 Km/hr (<15 Km/hr city center)

Changzhou BRT (2008)

Photo: Karl Fjelstrom - ITDP
Changzhou BRT

• Initial Operation: 2008
• Length: 24.6 Km (21.2 Km segregated)
• Stations: 26
• Ridership: N/A; 4,500 pphpd
• Frequency: 55 buses/hr
• Commercial Speed: 18 Km/hr

Chongqing BRT

- Initial Operation: 2008
- Length: 11.5 Km (6 Km busway, 3 Km fully segregated)
- Stations: 9
- Ridership: N/A; 200 pphpd
- Frequency: 4 buses/hr
- Commercial Speed: 32 Km/hr

Dalian BRT

- Initial Operation: 2008
- Length: 13.7 Km (9 Km busway)
- Stations: 14
- Ridership: N/A; 6,500 pphpd
- Frequency: 80 buses/hr
- Commercial Speed: 24 Km/hr

Jinan BRT
(2008)

Photo: Karl Fjelstrom - ITDP
Jinan BRT

- Initial Operation: 2008
- Length: 14.7 Km (13.7 Km busway)
- Stations: 22
- Ridership: N/A; 4,500 pphpd (N-S routes)
- Frequency: 40 buses/hr
- Commercial Speed: 20 Km/hr (<10 Km/hr in mixed traffic)

Xiamen BRT

- Initial Operation: 2008
- Length: 40.2 Km (38.2 Km busway)
- Stations: 30
- Ridership: N/A; 3,600 pphpd
- Frequency: 50 buses/hr
- Commercial Speed: 29 Km/hr

Transjakarta

- Initial Operation: 2004
- Length: 82.5 Km (120 planned by 2008)
- Stations: 115 stations (11 integration stations, 8 terminals)
- Ridership: 160,000; 3,600 pphpd
- Frequency: 40-10 buses/hr
- Commercial Speed: <15 Km/hr

http://www.itdp.org/index.php/projects/detail/jakarta_brt/
Pune BRT Pilot Corridor
(2006)
No level boarding causes inconveniences to passengers and increases dwell times

Inadequate pedestrian crossings

Overcrowded buses

Hadapsar Terminal

Pune BRT Pilot Corridor
Photos: Madhav Pai - EMBARQ
Pune BRT Pilot Corridor

- **Initial Operation:** 2006
- **Length:** 14.8 Km (3.6 Km busway; 94.6 Km planned)
- **Stations:** 27 bus stops
- **Ridership:** N/A; 3,600 pphpd
- **Frequency:** 30 buses/hr
- **Commercial Speed:** 14-16 Km/hr

Delhi BRTS Initial Corridor

- Initial Operation: 2008
- Length: 5.6 Km
- Stations: 12
- Ridership: N/A; 8,000 pphpd
- Frequency: 60 buses/hr
- Commercial Speed: 11-13 Km/hr

- Median lane busways on Arterial – open system (0.1)
- Small shelters with narrow platforms – insufficient bays (0.25)
- Mixed fleet (0.25)
- Manual fare collection – on board, no central control (0.1)
- BRT Rating: 0.70 (18%)

@ Ambedkar Marg & Mehrauli Badarpur Road Junction

Bus priority at junction
Delhi bus corridor had several problems during the first weeks:

- The traffic signals did not work properly. Signal cycles excessively long (12 minutes)
- Bus queuing at stations - spillovers
- High number of Blue Line Bus breakdowns in the bus lane.
- Bus drivers were not well informed of the new operations. Additional traffic wardens have helped providing instructions.
- Motor vehicles and two wheelers invaded the bus lanes
- Pedestrian jaywalking
The difficulties received wide media coverage – focused on the problems for car drivers.

New Delhi BRT trial triggers chaos | Your say

New Delhi: In the Capital, it’s a manic Monday, with chaos reported on stretches of roads implementing the pilot bus rapid transit corridor.

Road users continued breaking lanes, driving on cycle tracks, jumping red lights and jay walking - just as was reported on Sunday.

Capital chaos: BRT, road to nowhere | Metro mess

The trial runs of Bus Rapid Transit (BRT) corridor, a 6.6-km long corridor that segments roads in the Capital and gives high-capacity buses a dedicated lane to travel on, has seen confusion, chaos, traffic pile-ups and a long wait.

Officials implementing the project argue there are snags, but voices against the BRT are already demanding the project be scrapped.

On Face the Nation, CNN-IBN discussed whether urban India has run out of options to control traffic.

Delhi's BRT corridor bane for some, boon for others

New Delhi: Five days into the trial run, the name and much to the happiness of transport – is just a rapid transit corridor.

We are very happy with the project, its red, an enthusiastic bus-commuter said.

But for private vehicle owners, it’s clearly a different story.

“This stretch is hell. There’s been no change what-so-ever, still a mess,” said a car-owner while another said, “This is a waste of time and energy.”
Most problems are being corrected, but the concept is in doubt – expansion slowed down.

Transport officials satisfied with BRT progress so far

_new delhi: the transport commissioner of delhi held a meeting on tuesday to assess the progress on the controversial BRT corridor project.

Officials expressed satisfaction with the progress so far and they say they are working to improve the existing corridor from ambedkar nagar to moolchand.

There are plans to widen the roads, create a separate lane for cyclists and to bring the exclusive lane for buses to the left instead of keeping it in the middle.

Delhi’s problems resulted in a negative impact for BRT all over india
Summary BRT Rating
(Ahmedabad not Included)

Running Ways | Stations | Vehicles | ITS
---|---|---|---
Beijing BRT 2&3 | Hangzhou | Guangzhou | Jinan
Beijing BRT 1 | Xiamen | Changzou | Jakarta
Dailan | Chongqing | Kumming | Taipei
Delhi | Pune

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### Summary Performance

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<tr>
<th>City</th>
<th>Peak Load (pphd)</th>
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Conclusions

• BRT adoption is happening very fast in Asian developing countries
  – 6 systems started operations in China in 2008, 1 in 2009
  – 51 systems are being constructed or planned (30% in India)
  – National policies and funding for BRT development

• Quality and performance are varied
  – Learning by doing
  – BRT is not yet fully understood

Photo: Karl Fjelstrom - ITDP
Hitches, Hic-Ups

- Planning problems
  - Limited institutional capacity (human capital and funding)
  - Lack of familiarity with BRT concepts (infrastructure + buses + operations + technology)
  - Station design and integration of components

- Initial operations had difficulties
  - Open systems with scarce control (bunching – station spillover)
  - Traffic signal priority is missing
  - Accessibility issues

- Outstanding needs
  - Improved institutions to plan, supervise
  - Stress on operations and quality of service
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