

# What IS BRT, Really?

2007 Winter TextITE Meeting  
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Not BRT and RNY



## What is Bus Rapid Transit?

- “A flexible, rubber-tired form of rapid transit that combines stations, vehicles, services, running ways, and ITS elements into a fully integrated system with a strong image and identity” (*TCRP Report 90*)

## 6 Major Elements

- Running Way
- Stations
- Vehicles
- Fare Collection
- Intelligent Transportation Systems
- Service and Operating Plans

## Why BRT?

- Lower capital cost than LRT
- More cost-efficient at certain ridership
- Ease, flexibility, and quick timeframe of implementation
- Incremental upgrades as desired/required

## Cost Comparison

- Houston METRO's Southeast Corridor originally planned as LRT
- Concern regarding cost effectiveness
- Currently being designed as BRT-Convertible
- LRT infrastructure built in place; will be converted when ridership increases

## Cost Comparison

Item	Build Alternatives with Wheeler-MLK Alignment Option		
	LRT	BRT Convertible	BRT
Guideway and Track Elements	\$45.1	\$46.0	\$22.0
Stations, Stops, Terminals, Intermodal	\$18.8	\$19.4	\$19.4
Support Facilities: Yards, Shops, Administrative Buildings	\$4.4	\$0.0	\$0.0
Sitework and Special Conditions	\$61.8	\$28.0	\$27.7
Communication Systems	\$41.6	\$21.7	\$21.7
ROW, Land, Existing Improvements	\$20.0	\$12.04	\$12.4
Vehicles	\$27.4	\$8.3	\$8.3
Professional Services	\$79.3	\$37.2	\$29.4
Unallocated Contingency	\$30.6	\$18.0	\$14.38
Finance Charges	\$0.0	\$0.0	\$0.0
<b>Total Cost (2006) Dollars (Millions)</b>	<b>\$329.0</b>	<b>\$191.0</b>	<b>\$155.7</b>
Total Length in Miles	6.03	6.03	6.03
Cost per Mile (2006) Dollars (Millions)	\$54.6	\$31.7	\$25.8

## Stages of Implementation

- Stage I
  - Mixed traffic on corridors and streets
  - Moderate operations management improvements
  - Some vehicle improvements
  - Improved stops



## Stages of Implementation

- Stage II
  - Mixed traffic on expressway
  - Significant operations management improvements
  - Some vehicle improvements for ease of use
  - Upgraded stations and/or stops

## Stages of Implementation

- Stage III
  - Semi-dedicated lanes
  - Significant operations management improvements
  - Some vehicle improvements for ease of use
  - Upgraded stations and stops

## Stages of Implementation

- Stage IV
  - Dedicated lanes
  - Extensive operations management improvements
  - Vehicles designed for ease of access and comfort (multiple doors, interior configuration)
  - Advanced station design

## BRT in the United States

- *TCRP Report 90*: 13 U.S. case studies
- FTA demonstration projects (map below)



## Examples

- Curitiba
- L.A. Rapid
- Las Vegas MAX
- L.A. Orange Line
- Eugene-Springfield EmX

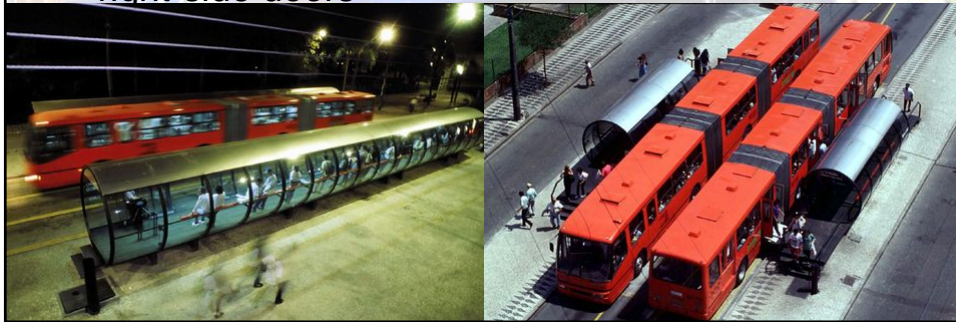
## Curitiba (Brazil)

- Considered the first BRT (began in 1974)
- About 70% of population use bus system
- 37 miles of median busway in 2001
- Traffic signal priority (TSP)
- Avg speed: 12 mph
- 11,100 passengers in peak period, peak hour on busiest busway
- 188,000 passengers daily on busiest busway
- Up to 90 sec headway



## Curitiba (Brazil)

- Cylindrical high-level platforms
- 80-foot, bi-articulated diesel buses with 5 right-side doors
- Level, hi-floor boarding
- Off-board fare collection



## L.A. Rapid

- Began in June 2000
- 15 routes in Jan. 2007, 3-10 min peak headway
- Distinctive, low floor buses (40-60 ft)





## L.A. Rapid

- Limited stops with enhanced features
- On-board fare collection



## L.A. Rapid

- Operates in mixed traffic
- TSP
- Initial routes had 29% reduction in travel time, 40% increase in ridership (1/3 new transit riders)



# Las Vegas MAX

- Service began June 30, 2004
- European-made vehicle with 4 doors (right side only)
- Designed with optical station docking system, but had to use manual docking instead



# Las Vegas MAX

- 7 miles in 4<sup>th</sup> busiest corridor (many residents with high transit need)



## Las Vegas MAX



## L.A. Orange Line

- Started Oct. 29, 2005
- 14 miles exclusive busway
- Stations with enhanced amenities
- Off-board fare collection





## L.A. Orange Line



## L.A. Orange Line

- 60-ft low-floor articulated buses, 3 doors on right side



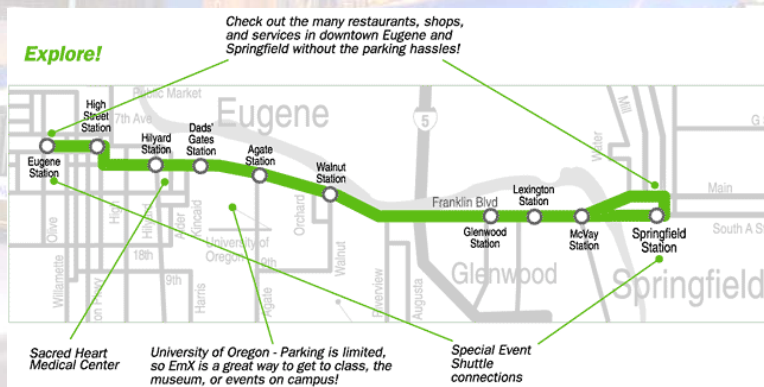


## L.A. Orange Line



## Eugene-Springfield EmX

- Service began January 2007
- Connects two CBDs in 16 minutes
- Currently free fare



## Eugene-Springfield EmX

- Mixture of dedicated lanes and transitways
- Queue jumping and TSP



## Eugene-Springfield EmX

- Median stations necessitate 2 left side doors (also 3 right side doors for curbside stations)
- Low floor, level boarding



## Implications of BRT on Traffic Operations

- Impacts of running way (capacity, access, parking)
- Supporting signing and pavement markings
- Supporting traffic operational strategies (queue by-pass, signal phasing and priority)
- Pedestrian safety

## Resources

- *Characteristics of Bus Rapid Transit for Decision-Making*  
(<http://www.fta.dot.gov/documents/CBRT.pdf>)
- *TCRP Report 90: Bus Rapid Transit*  
([http://onlinepubs.trb.org/onlinepubs/tcrp/tcrp\\_rpt\\_90v1.pdf](http://onlinepubs.trb.org/onlinepubs/tcrp/tcrp_rpt_90v1.pdf) and  
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