



What is BRT?

Miami-Dade County
Transportation Committee Meeting
July 22, 2004

Sam Zimmerman
Principal, Transportation Planning

DMJM  HARRIS
AN AECOM COMPANY

BRT: Bus Rapid Transit

- **Flexible, permanently integrated high performance system with a quality image and a strong ID**
- **Package of components appropriate to current and future:**
 - **Markets served**
 - **Physical environment**

BRT System Components



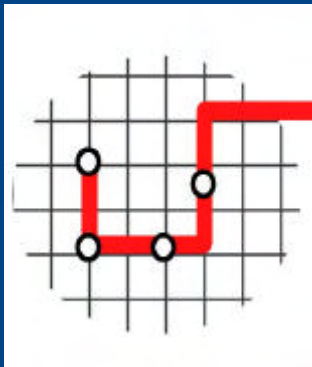
Vehicles



Running Ways



Stations & Terminals



Service Plan



Systems

BRT: Infinite Possibilities

Essential Attributes

- Speed
- Reliability
- Identity and image

Stops, Stations and Terminals

- **.25 – 1 mile station spacing**
- **Permanent, substantial, weather protected**
- **Amenities, passenger information**
- **Good pedestrian, local bus, auto access**
- **Safe, secure**
- **Convey identity and image**
- **Design integrated with surroundings**

Stations Options

Brisbane: SE Busway



Pittsburgh; MLK Busway Ext.



Running Ways

- **BRT can operate in broad variety of physical and operating environments, but segregated, dedicated preferred**
- **Critical planning and design parameters:**
 - *Ability to safely support rapid, reliable services*
 - *Safe rapid transit vehicle access*
 - *Identity, aesthetics*

Arterial Bus Lanes, Median Transitway



Boston: Silver Line

Vancouver: 98B



Bus/Transitway on Freeway ROW



*Shoulder
Brisbane: SE Busway*

*Median
Houston: Transitways*



Busway on Railroad ROW



Pittsburgh: East (MLK) Busway



Elevated Sections



Runcorn, UK

DMJM  HARRIS
AN AECOM COMPANY

Tunnels

Brisbane: SE Busway



Seattle: CBD Bus Tunnel



Running Way Guidance



*Optical
Rouen, France*

*Mechanical
Leeds, UK*



Vehicles

- Rubber-tired, steered and/or guided
- Variety of sizes through 80+ feet
- Conventional buses or special BRT vehicles
- Environmentally friendly
 - *Low emissions*
 - *Quiet*

BRT Vehicle Options



Conventional

*Van Hool 300AG
Zuidtangent
Amsterdam*



Specialized

*Irisbus CiviS
Clean-Diesel/Electric
Las Vegas MAX*

BRT Vehicles

Well- Lit, Open, Quiet Interior



Van Hool 300AG

Fare Collection

? Needs to facilitate multiple stream boarding

- Off-board (preferred)**
- On-board multi-point payment**
- Significant pass utilization**

? Integrated with but may not be the same as for local bus system

Off-Board Fare Collection Options



*Proof-of Payment: TVM
Paris: Val de Marne*

*Access Control: Magnetic Card
Bogota: Transmilenio*



ITS

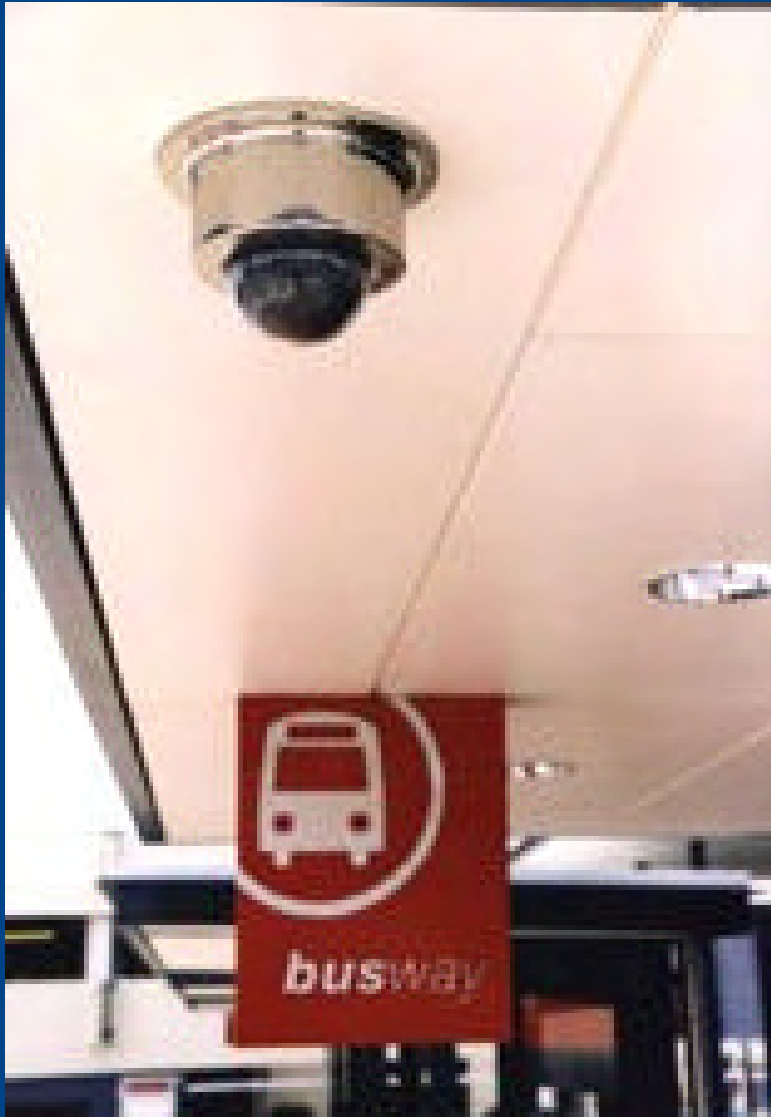
- **Automatic vehicle location**
- **Passenger information**
- **Safety, security**
- **Signal priority**
- **Communications**
- **Fare collection**
- **Vehicle guidance and control**

Central Control Room Vehicle Location, Service Supervision

Brisbane SE Busway



Station Security



Brisbane SE Busway



Passenger Information



*At Stations
LA: Metro Rapid Bus*

*On Board
Paris: Val de Marne Busway*

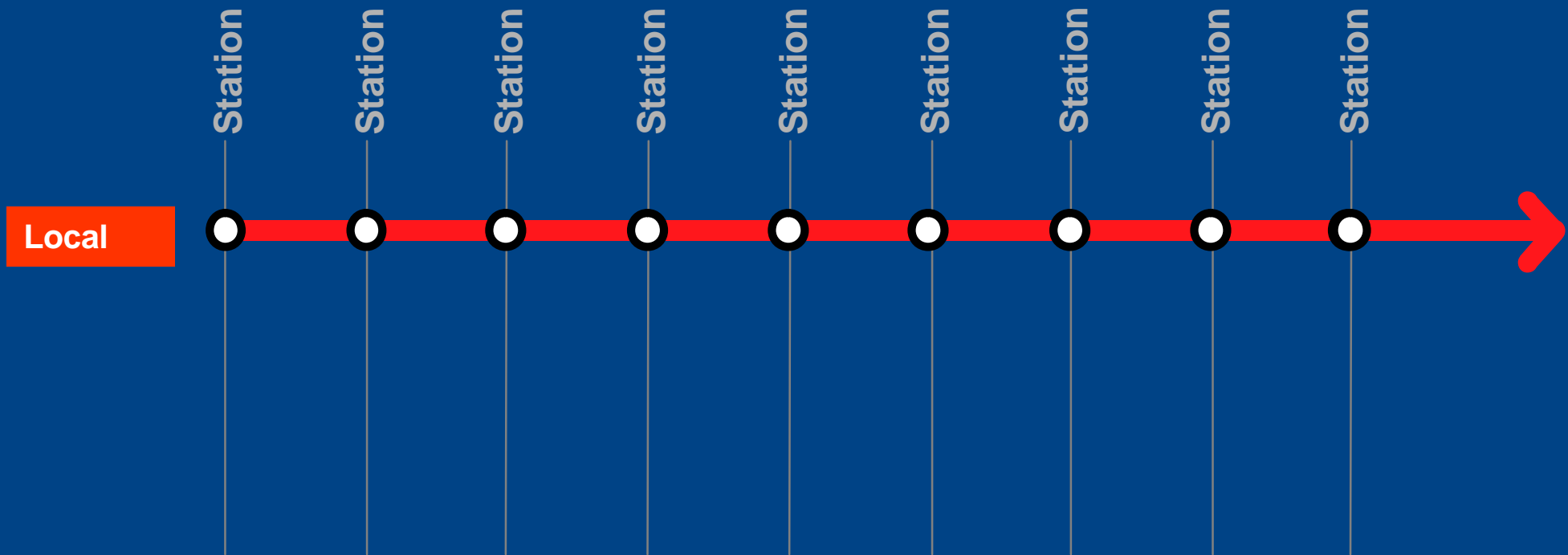


Service Plan

- **All-day, Frequent Service**
 - 8-10 Minutes Or Better In Peaks
- **No Schedule Needed**
- **Simple Route Structure**
 - Direct, Easy To Understand
- **Use BRT Flexibility**
 - Maximize Directness, Minimize Transfers

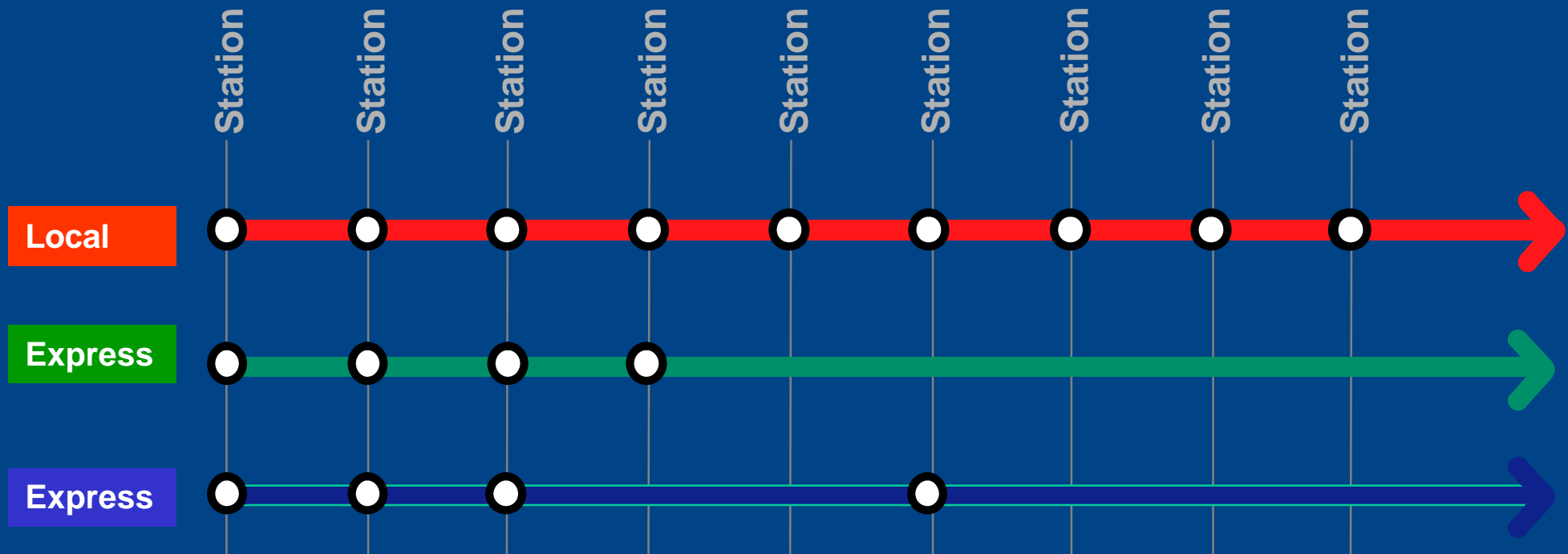
BRT Service Plan Options: Simple End

All-day, local all-(limited) stop trunk line



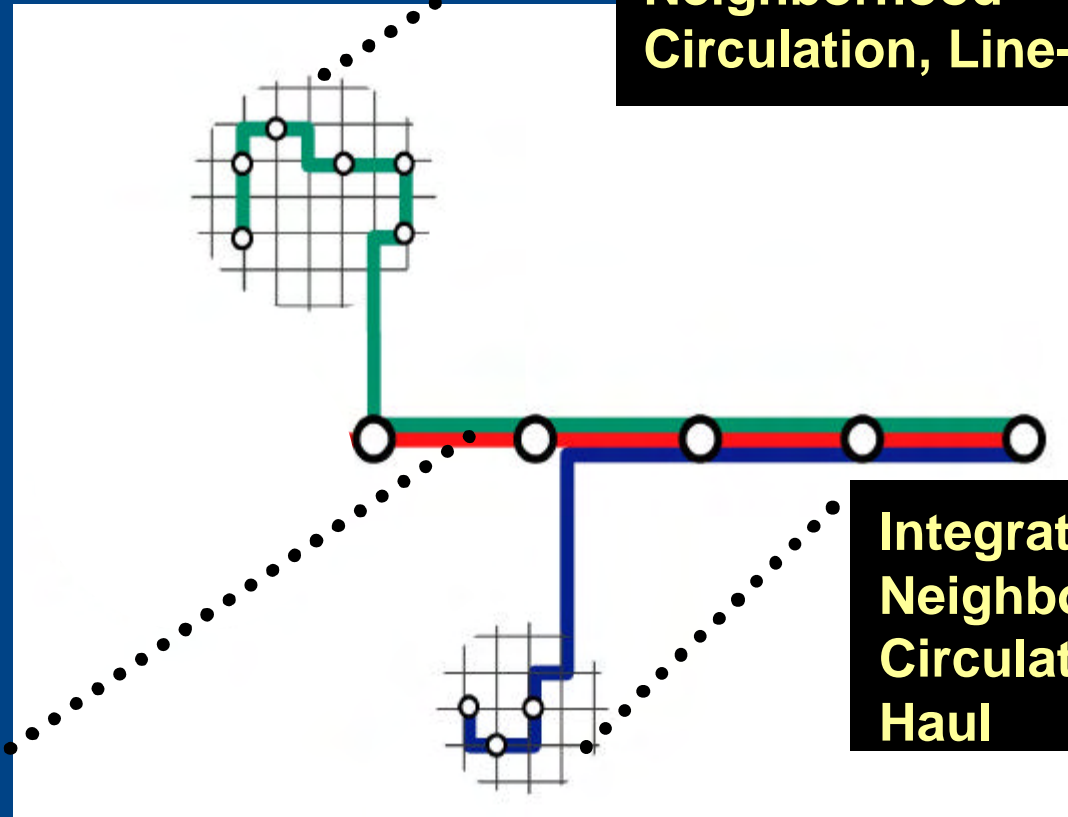
BRT Service Plan Options

- ? *Base: All-day, local all-stop trunk line*
- ? *Overlay: Peak only or all-day express services*



BRT Service Plan Options: Most Complex

- ? *Base: all-day, local all-stop trunk line*
- ? *Peak-only or all-day integrated services*



**Integrated
Neighborhood
Circulation, Line-Haul**

**Integrated
Neighborhood
Circulation, Line-
Haul**

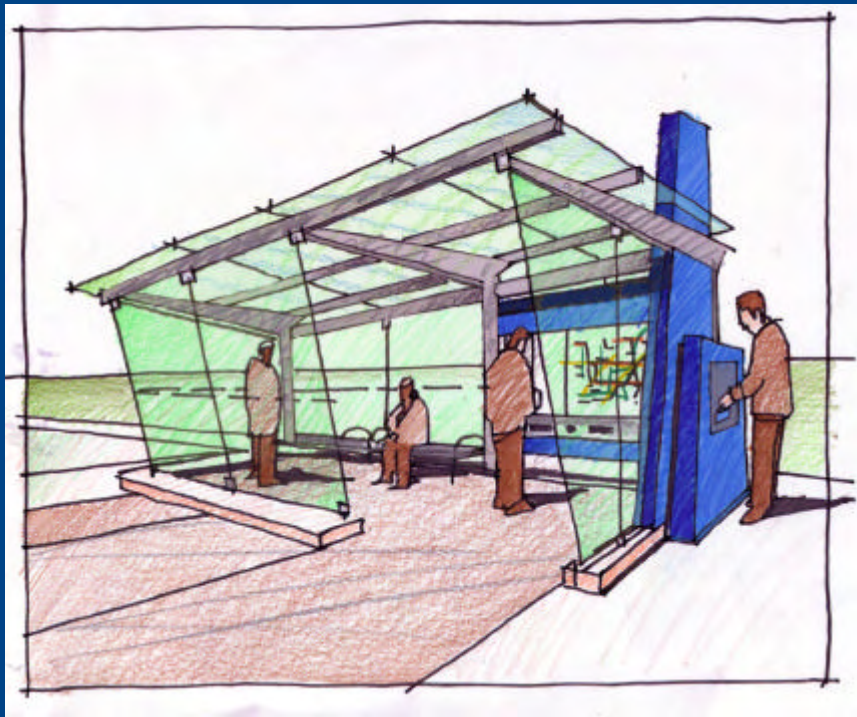
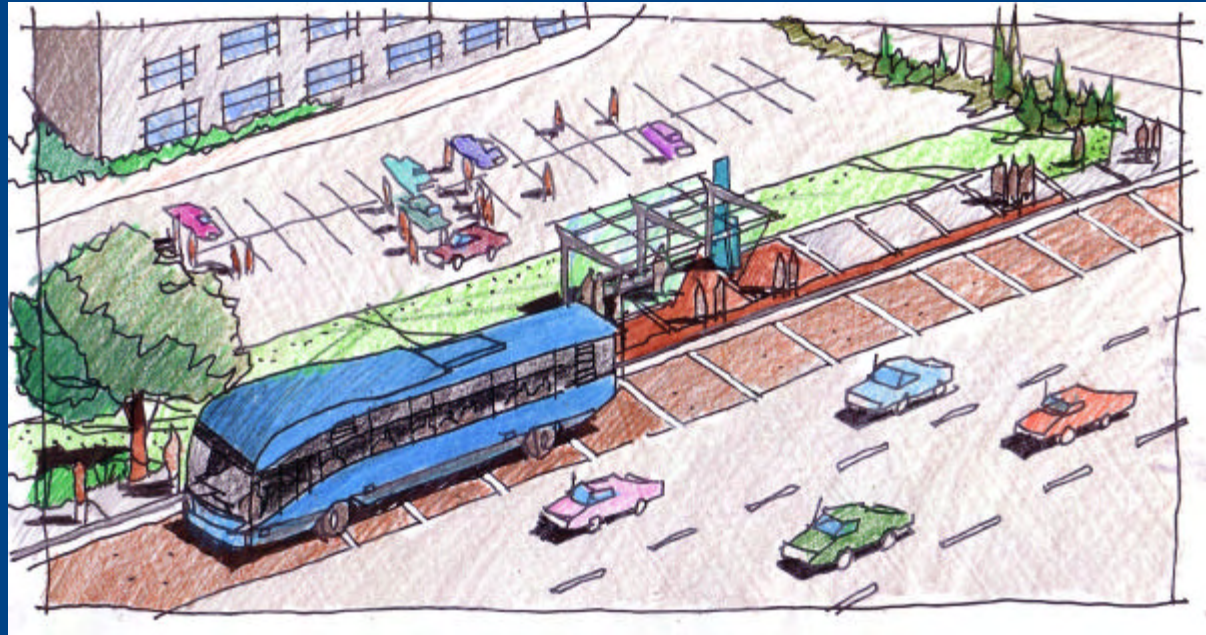
**All Stops,
Local Trunk
Line**

Conveying System Identity & Image

- **Vehicles:**
 - Design, colors, graphics, signage
- **Stops, Stations, Terminals:**
 - Design, colors, graphics, signage, materials
- **Running Ways:**
 - Barriers, pavement markings/materials/ colors, graphics, signage, landscaping

Consistent, Unique Station Design

*York Rapid Transit
York (Toronto) Ontario*



Unique Vehicle Livery



"98 B-Line" BRT



"99 B-Line" BRT

***Regular Vancouver
TransLink Bus***



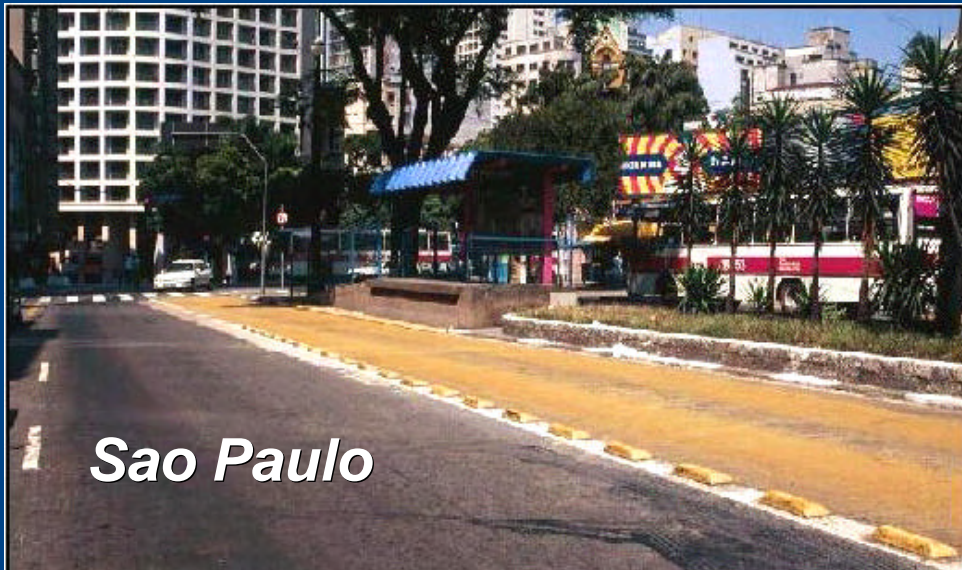
Consistent, Unique Graphics



Brisbane: S.E. Busway



Running Way Color, Markings

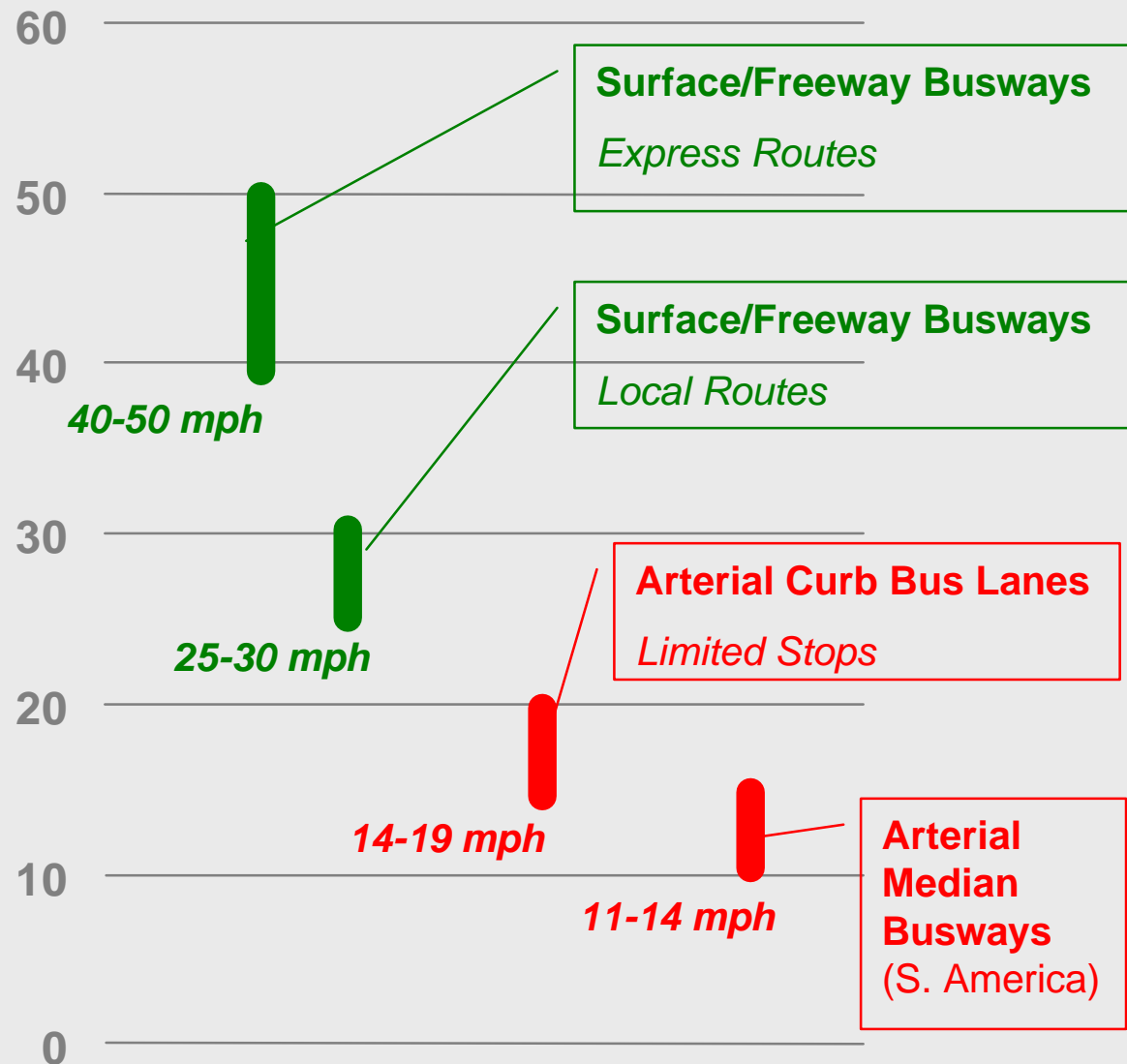




How is BRT Working?

RT Operating Speeds

- Operating Speeds by ROW Type
– MPH



Significant Time Savings

Compared to Local Bus

Busways and Freeway Bus Lanes	32 – 47%
Bus Tunnel (Seattle)	33%
Arterial Street Busways / Bus Lanes	29 – 32 %

Modest Operating & Maintenance Costs (Port Authority of Alleghany County, Pittsburgh)*

	PAT West Busway	PAT LRT
\$/Rev.Veh.Mi.	\$ 6.40	\$ 15.25
\$/Rev.Veh.Hr.	\$81.90	\$222.37
\$/Pass.-Mi.	\$ 0.65	\$ 0.84
\$/Brdng	\$ 2.73	\$ 3.78

*** FTA Evaluation of Port Authority of Alleghany County
West Busway Bus Rapid Transit Project, 4-2003**

Attractive to Customers

	% Ridership Gain in Corridor	% of Ridership New Transit Trips
Los Angeles	+40% (3 Yrs.)	>30%
Miami	+70% (5 Yrs.)	>50%
Brisbane	+60% (2 Yrs.)	47%
Vancvr., BC	+30% (2 Yrs.)	>25%
Boston	+100% (18 months	>30%
Oakland	(10 months)	>25%

Boston Silver Line: Prior Means of Transportation

Prior Transportation Means	Percentage of Riders
MBTA Bus	67%
MBTA Subway	32%
Drove Alone	4%
Carpool	--
Walked	18%
Didn't Make Trip	7%
Other	2%

***Adds up to greater than 100% because respondents that formerly used more than one mode gave multiple answers**

Attractive to Customers with a Choice*

Houston Metro Services, Customers	% Riders with Household Incomes > \$50,000/Yr	% Riders with Household Incomes > \$75,000/Yr	%Riders from Households with > 2 Vehicles
Park/Ride Services (Rubber-tired Commuter Rail)	70%	50%	61%
Local Bus	11%	-	16%

** 2002 On Board Survey*

High Capacities Achieved

- **Maximum Volumes***
 - **Peak Hour, Peak Direction**

25,000 / hour	Sao Paolo (Nova de Julio) Bogotá Transmilenio NYC Lincoln Tunnel XBL
15 – 20,000 / hour	Porto Alegre Quito
10 – 15,000 / hour	Curitiba Ottawa Brisbane

* Highest LRT Volumes in U.S., approx. 10,000/Hr.,
Boston Green Line and San Francisco Muni Metro

Attractive to Developers, Owners

- **Significant Urban Development Effects**
 - **Curitiba Surface Metro**
 - **Ottawa Transitway System**
 - **Pittsburgh East Busway**
 - **Denver: 16th Street Mall**
 - **Brisbane SE Busway**
 - **Boston Silver Line**

Boston: MBTA Silver Line

\$700 M Worth of Projects Along Line Since Construction Began



Boston MBTA: Silver Line, Washington St.



*New Mixed Use Development
Adjacent to Stations*



Denver 16th St. Mall



New Entertainment Venues



Ottawa Transitways



*St. Laurent Mall: Highest Grossing
per Sq. Ft. In Ottawa, 30% Mode Share*



“Brisbane Courier Mail,” 7/2/02

- **Brisbane: Southern Suburbs, available**
... with owner, 5 minutes walk from Garden City, Busway etc. Looking for a mature reliable person with ... for 3 b/r townhouse Greenslopes. Walk to busway and Logan Road. \$75 a week, airconditioning, LUG ...

“Brisbane Courier Mail,” 1/26/02

Busway boosts house values

Joel Gulrey

PROPERTY values along Brisbane's South-East Busway have jumped as much as 20 per cent as buyers take advantage of public-free travel to the city.

Prices in the southern suburbs of Holland Park West, Upper Mount Gravatt and Eight Mile Plains have increased since the \$350-million busway opened in March 2001, providing an escape from South East Freeway traffic snails.

Real Estate Institute of

Queensland research shows suburbs with direct access to the busway's stations had solid growth over the recent quarter.

"Most other suburbs next door to these busway suburbs also performed well, however they did record percentage changes slightly below those near the busway," REIQ president Mark Brimble said.

The most outstanding jump was in Holland Park West, where values rose 20.66 per cent.

The neighbouring suburb of Holland Park, which does

not have direct busway access, rose 6.23 per cent.

The comparisons showed busway suburbs were performing above city-wide increases which have seen nearly all areas within 10km of the CBD improve in value.

Other neighbouring suburbs that did not perform as well include Mount Gravatt East, which recorded 4.78 per cent compared with 8.29 per cent in the busway suburb of Mount Glorious, and Easvvale, which increased by 1.56 per cent

compared with a jump of 1.93 per cent in busway suburb Eight Mile Plains.

"This research supports the trend that more people are moving to areas within five to 10km of the CBD which are close to convenient public transport such as the busway," Mr Brimble said.

Queensland Transport recorded a "passenger boom" on the busway, with a 40 per cent growth in passenger figures in its first six months, or about 88,000 passenger trips a day.

The figures also showed approximately 375,000 private vehicle trips were converted to public transport along the busway, which straddles the South East Freeway.

Property values also would increase if proposed extensions of the busway along northern and eastern routes went ahead, analysts said.

National Property Research analyst Matthew Gross said areas near public transport nodes would nearly always rise in value.

"Historically, housing has always followed public transport nodes. Those closer to transport generally have high values," Mr Gross said.

"A lot of investor stock in rental properties are considered worth more if they are close to public transport because they are easier to rent."

The \$135-million Inner Northern Busway is nearing completion, and the planned dedicated bus lanes will get passengers uninterrupted travel as far as Kedron.

BRT Urban Design Integration



Brisbane SE Busway Station



Lessons Learned

Lessons Learned

(Apply to any Rapid Transit Mode)

- ? Use transportation planning process to sort out alternatives**
- ? Serve demonstrated markets**
- ? Match markets with service plans, running ways, vehicles, stations**
- ? Begin integration with land use planning early**

Lessons Learned Unique to BRT

- **Work hard to inform public and decision-makers that BRT is A high quality, high performance RT option**
- **Plan For BRT As For Any Rapid Transit Mode (i. e., Use Rail Criteria)**
- **Recognize that there is no single BRT system prescription**

Lessons Learned Unique to BRT

- **Focus on system integration and identity**
- **Be willing to spend money on BRT**
 - **Maintain system integrity**
 - **Resist de-construction**

END