



BRT – Bus Rapid Transit



“.....when productivity counts”



System Approach



Attractiveness

- ✓ *Speed*
- ✓ *Frequency*

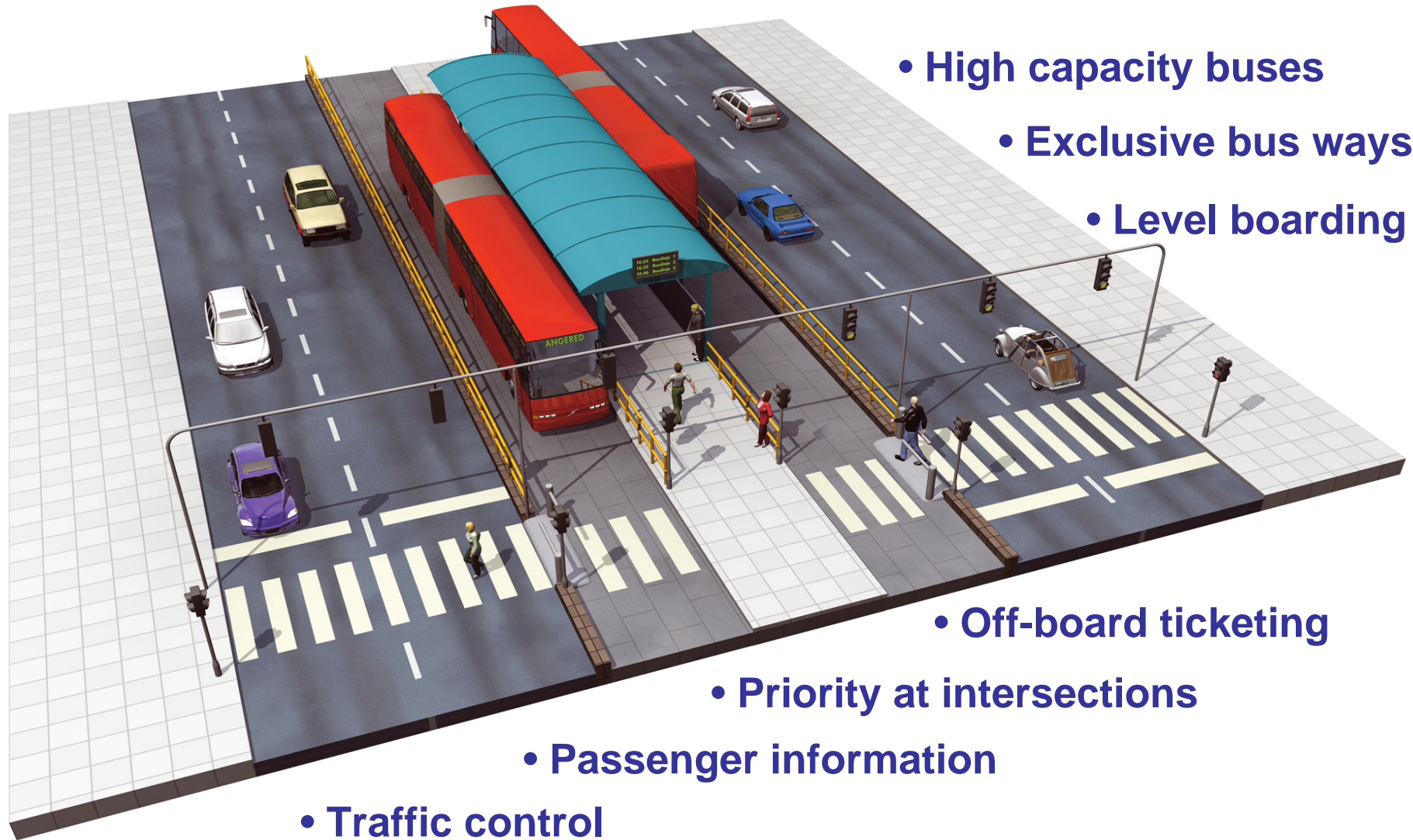
Environment

- ✓ *Energy efficiency*
- ✓ *Modal integration*

Self finance capabilities

- ✓ *Revenues*
- ✓ *Operational costs*

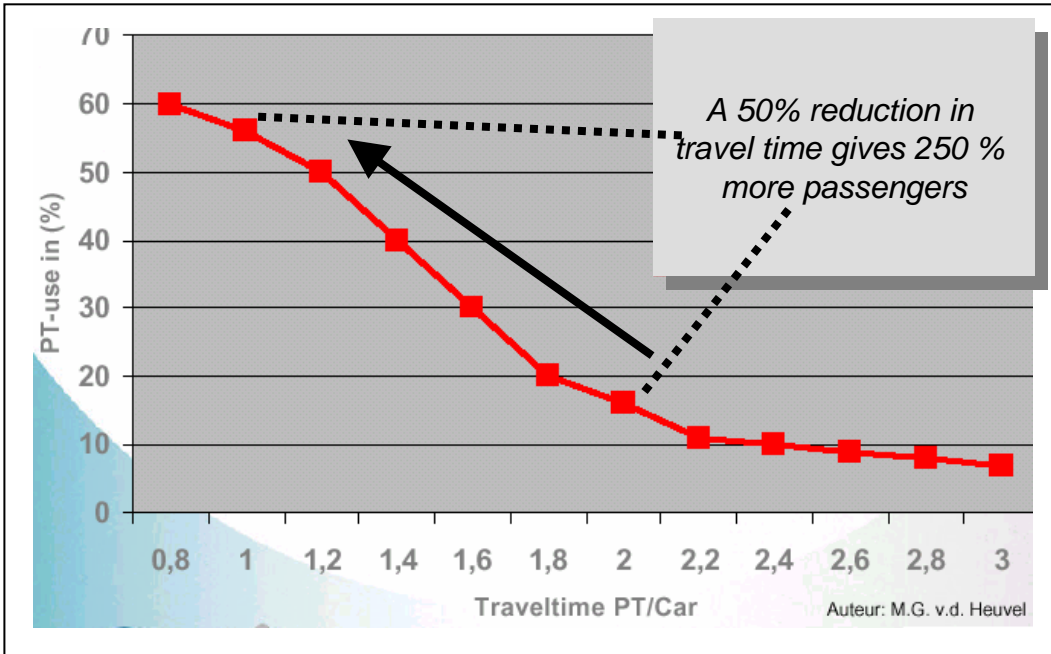
BRT Elements



- High capacity buses
- Exclusive bus ways
- Level boarding

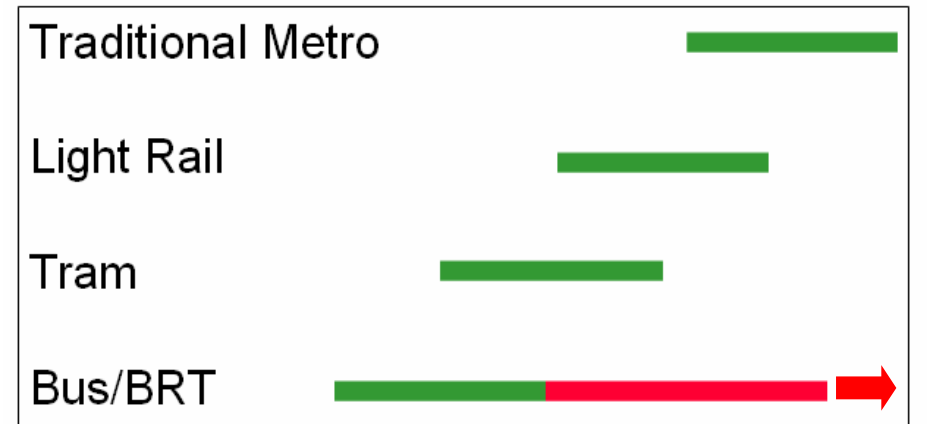
- Off-board ticketing
- Priority at intersections
- Passenger information
- Traffic control

BRT is competitive to rail!



Relationship travel time & passenger acceptance

BRT competitive to Rail



Relationship transport type & capacity

Pass flow/dir/h 0 5k 10k 20k 40k

█ traditional
█ with BRT

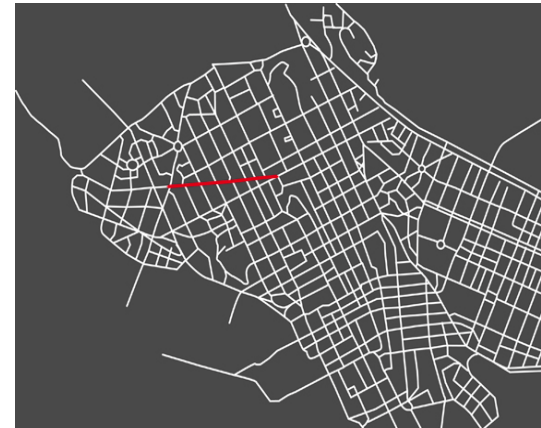
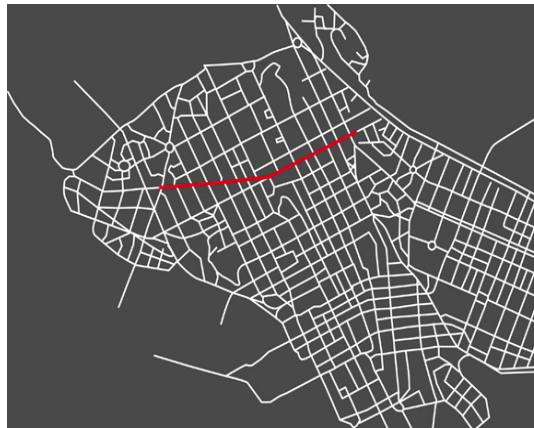
BRT – Minor Investment

For 1 billion dollars you get:

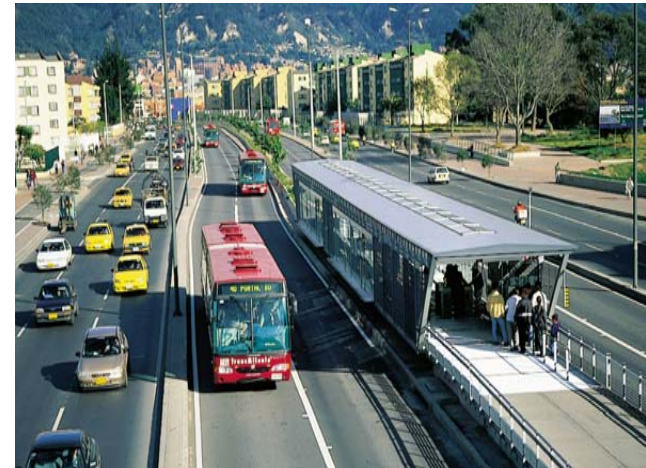
426 km of BRT

14 km of elevated rail

7 km of subway



Investment in infrastructure per km	1–10M€	50–200M€
Investment in vehicles per pass. capacity	2,000€	6,000€
Capacity (1,000 pass./h)	15–40	30–50
Average speed (km/h)	20–30	25–35
Relative investment per capacity	1	10–30
Completion of one line (year)	1–2	3–5
Operational costs	Low	High



BRT vs. Tram

	<u>BRT</u>	<u>Tram</u>
➤ Investment in infrastructure per km	1-5 M€	10-15 M€
➤ Investment in vehicles per pass. capacity	2.000 €	6.000 €
➤ Capacity (1.000 pass./h)	10-40	10-15
➤ Average speed (km/h)	20-30	20-30
➤ Relative investment per capacity	1	3-15
➤ Time from project start (year)		
From start	1	4
to completion	3-5	10-15
➤ Flexibility in infrastructure	High	None
➤ Implementation of new technology	High	Low

How to transport 10.000 persons 1 km

	Passengers (numbers) (liters)	Vehicles (numbers)	Space (m ²)	Fuel
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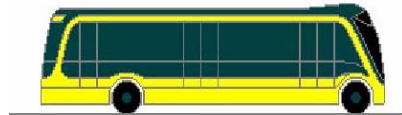


5

2000

24000

200

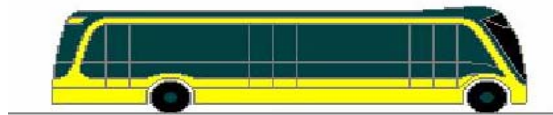


25

400

8800

120



100

100

3400

50

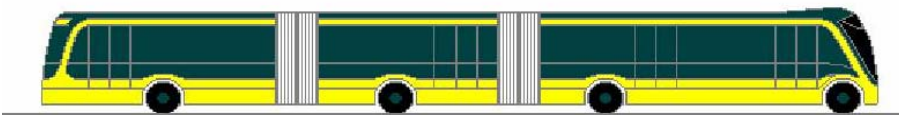


175

57

2850

35



270

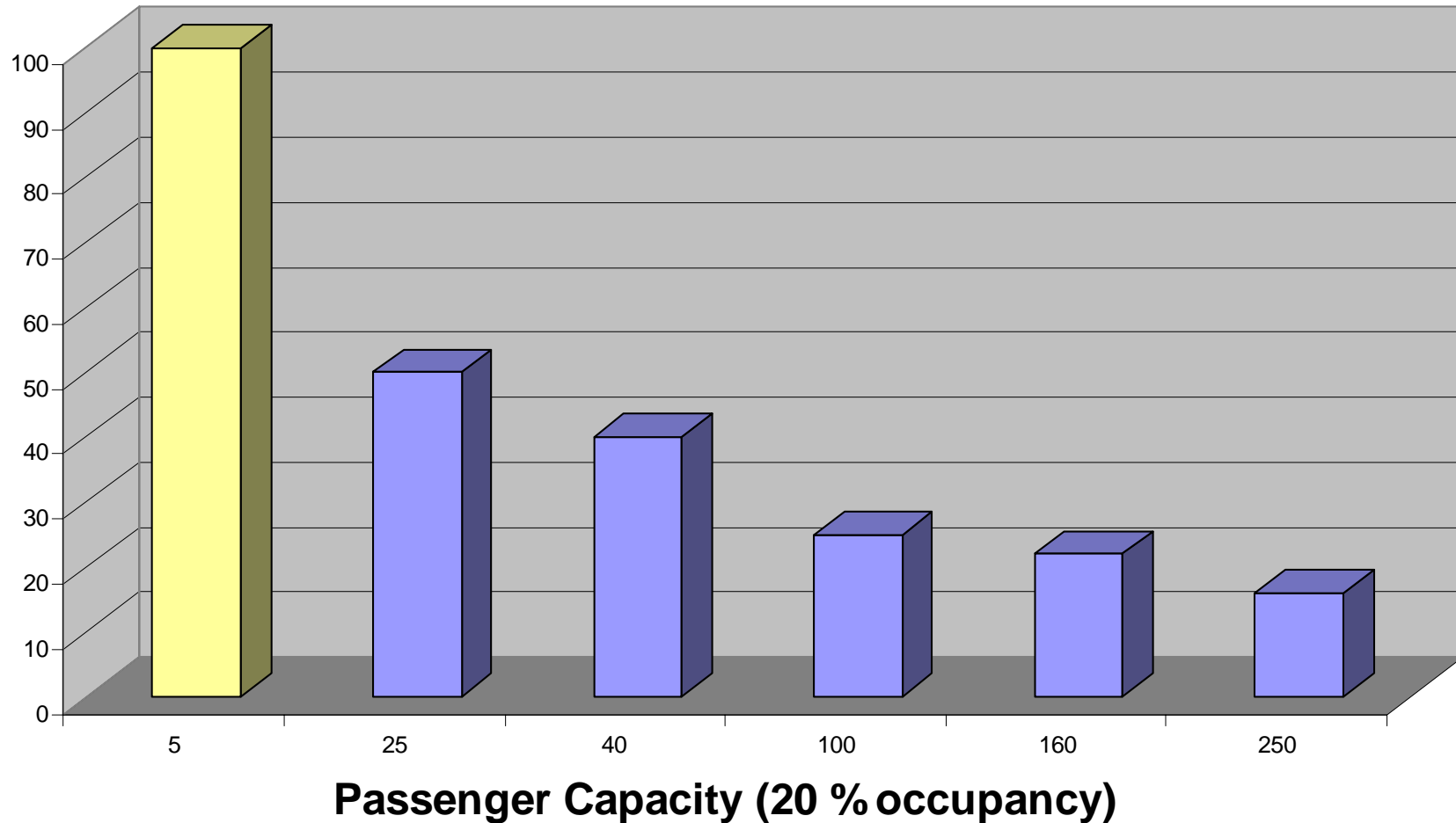
37

2370

26

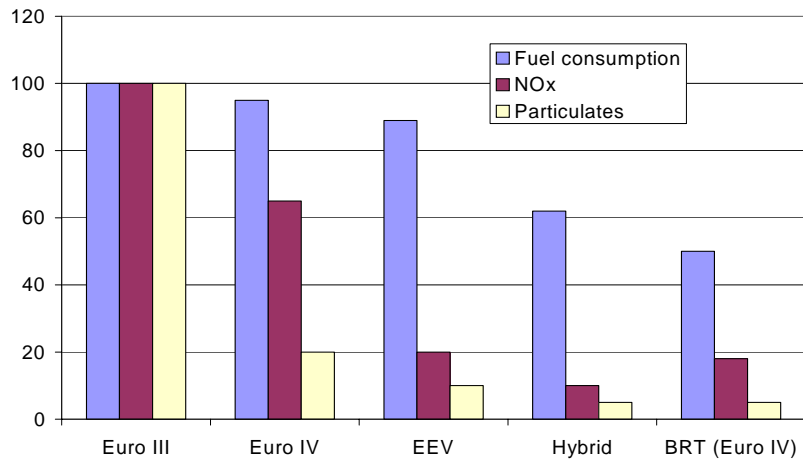
Fuel Consumption vs Capacity

gasoline car vs diesel buses in city cycle



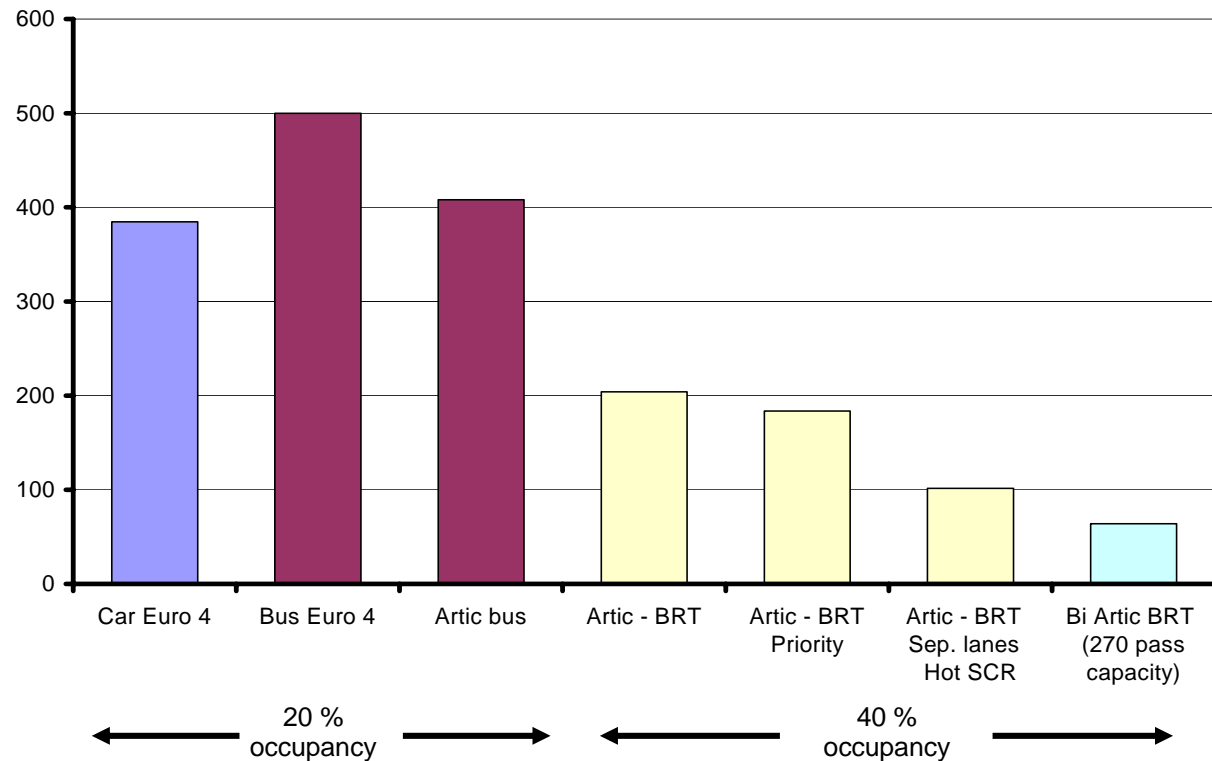
Emissions - BRT operation adds to Clean Vehicles

Vehicle technology improvements

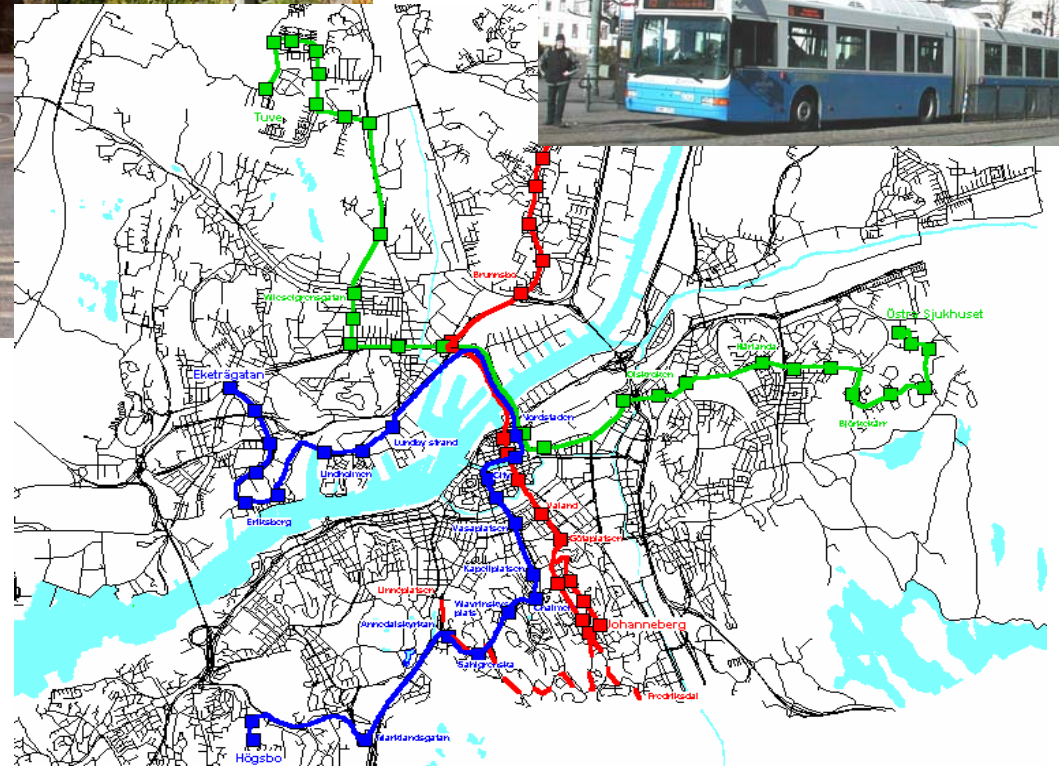


BRT

NOx mg per passenger kilometre



In Göteborg we have trams.....



.....and buses

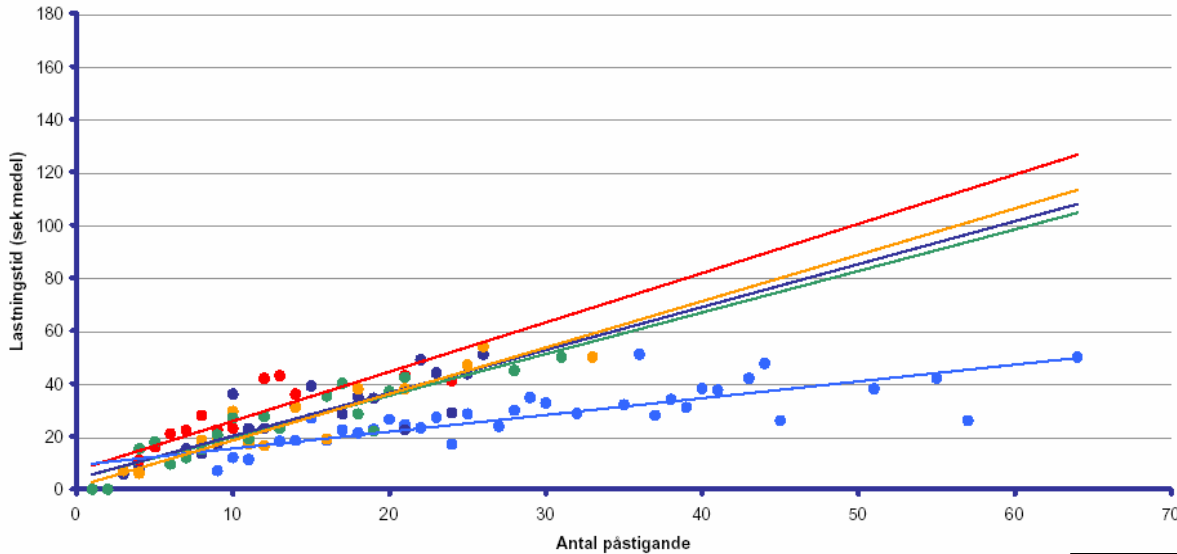
Characteristics of the Trunk Bus Line in Gothenburg

1. Part of an easy informed system
2. 3 minute headway in peak hours (10 min off peak)
3. High accessibility in roads and junctions
4. Less stops
5. Boarding through all doors
6. Highest standard of bus stops
7. Real time information on stops
8. Highest standard of buses
9. Best environmental technology



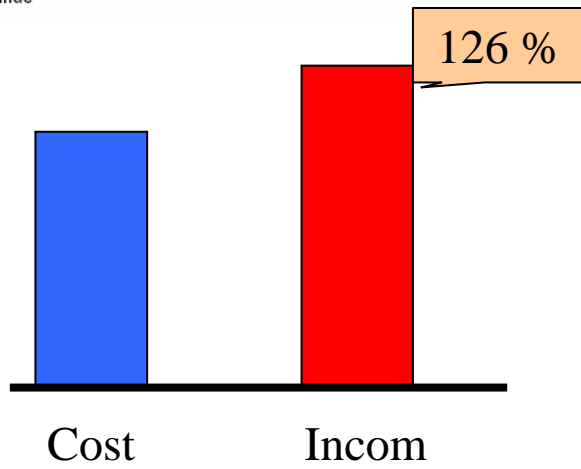
BRT – Lower Boarding Time

● 2003 Linje 16 ● 2003 Låg-ledbuss ● 2003 Låg-normalbuss ● 2003 Normal ledbuss ● 2003 Normal buss

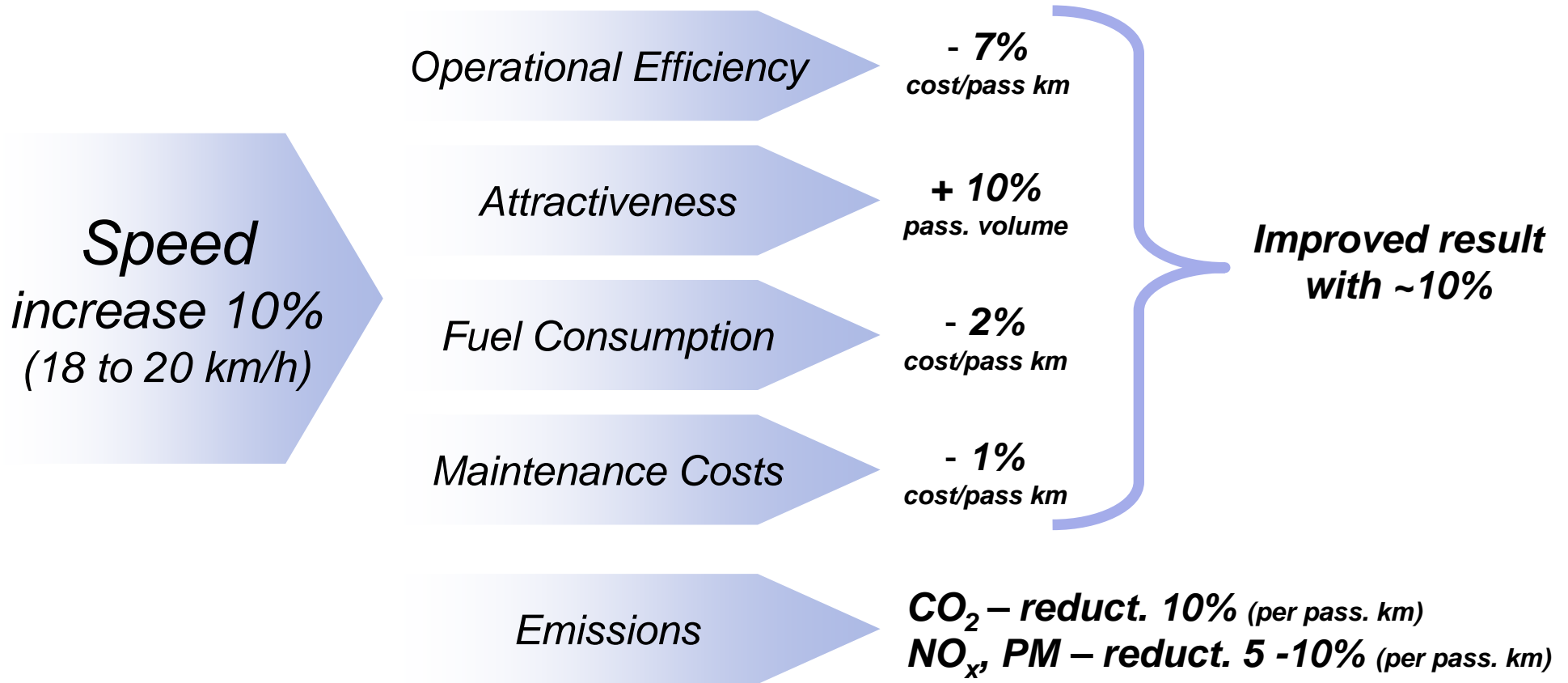


Bus type	Seconds
Normal, high floor	105
Normal, low floor	110
Art., high floor	130
Art., low floor	100
Trunk bus	48

BRT contributing

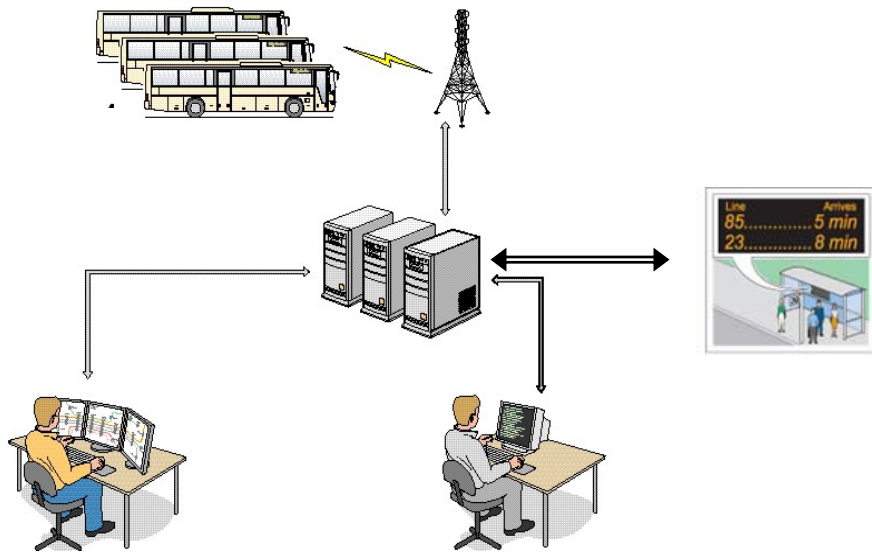


Speed – Impact on Productivity



Volvo's Telematics - ITS4mobility

Supports the operation with functionality for all stakeholders



*Puts you in control ...
and the passenger in focus!*

PTA

Traffic Control

*Timetable/frequency monitoring
Automatic vehicle location*

Passenger

Travel Information

*Next stop announcement,
Signs mgmt, Real-time info*

Operator

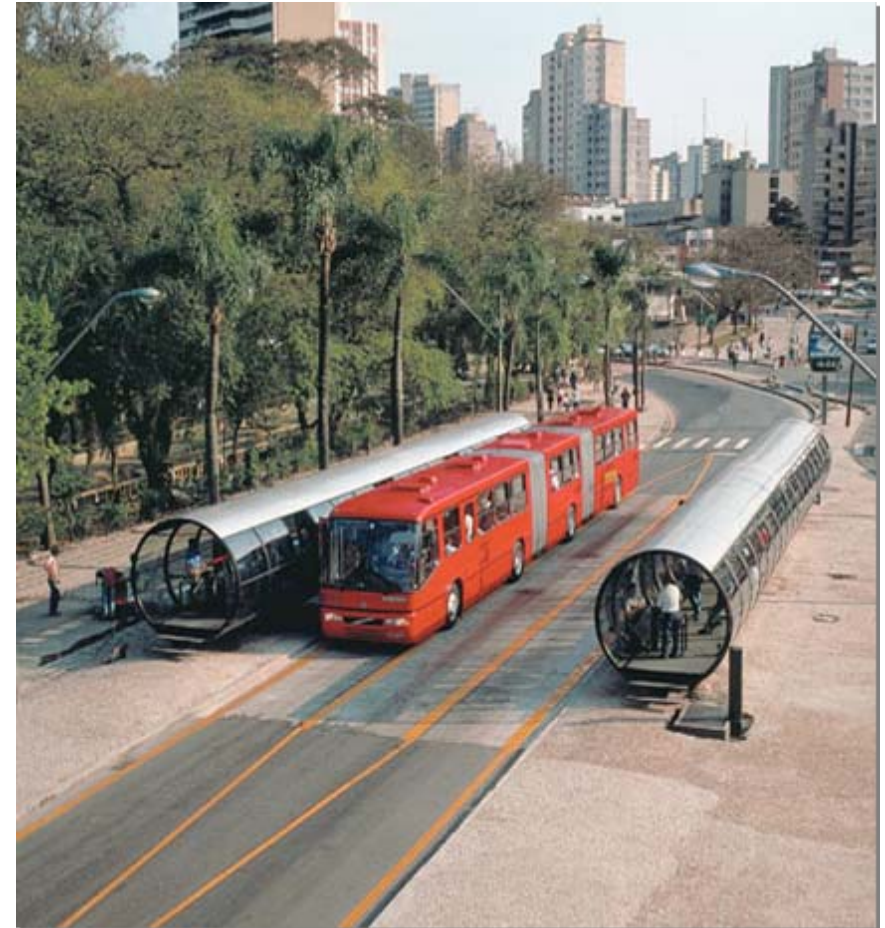
Fleet Management

*Vehicle & driver performance
Fuel management*

BRT – Curitiba, Brazil

Description: The basic idea of BRT was born in Curitiba during the 1970's. The system has developed step-by-step and is now complete. Curitiba is a world reference for efficient transportation.

Km of separate infrastructure	84 km
Passenger capacity	1.000.000 pass/day
Number of buses	375 (+1100)
Bus type/length	Articulated 18m Bi-artic 25m
Floor height	High
Fuel	Diesel
Volvo market share	100%



BRT – Bogotá, Colombia

Description: Bogotá, with 7 million inhabitants, has a BRT system which is recognised for its high capacity and efficient operation. It is called “Transmilenio” and will be further extended.

Km of separate infrastructure	<i>80 km</i>
Passenger capacity	<i>1.500.000 pass/day</i>
Number of buses	<i>1.050 (+500)</i>
Bus type/length	<i>Articulated 18m</i>
Floor height	<i>High</i>
Fuel	<i>Diesel</i>
Volvo market share	<i>55 %</i>



BRT – Mexico City, Mexico

Description: Mexico City will start to operate the first BRT line in 2005. Today 25.000 buses operate in the city in a poorly organised operation. The ambition is to gradually expand the BRT lines to an integrated system.

Km of separate infrastructure	<i>22 km</i>
Passenger capacity	<i>280.00 pass/day</i>
Number of buses	<i>97</i>
Bus type/length	<i>Articulated 18m</i>
Floor height	<i>High</i>
Fuel	<i>Diesel</i>
Volvo market share	<i>75%</i>



BRT - Santiago, Chile

Description: Santiago, with 7 million inhabitants, will implement a BRT system, Transantiago, starting in 2005. Fully developed 4.700 buses will serve the system. There will be a blend of separate bus lines and mixed traffic. The trunk lines will use 18m low floor articulated and feeder lines with 12m low entry

Km of separate infrastructure	<i>100 km</i>
Passenger capacity	<i>1.500.000 pass/day</i>
Number of buses	<i>1.150 (+620)</i>
Bus type/length	<i>Articulated 18m</i>
Floor height	<i>Low</i>
Fuel	<i>Diesel</i>
Volvo market share	<i>100 %</i>



BRT – Gothenburg, Sweden

Description: Gothenburg, the home town of Volvo, has two very popular BRT lines. The system will be extended with a new line during 2007 and a few bi-artic buses are used.

Km of separate infrastructure	<i>10 km</i>
Passenger capacity	<i>20.000 pass/day</i>
Number of buses	<i>18</i>
Bus type/length	<i>Articulated 18m, and 24m</i>
Floor height	<i>Low</i>
Fuel	<i>CNG (diesel 24m)</i>
Volvo market share	<i>100%</i>



Volvo in co-operation with cities



➤ Curitiba: Artic- and Bi-Artic buses with high floor



➤ Bogota: Traffic planning and artic buses



➤ Stockholm: Artic buses with low entry



➤ Santiago: Artic buses with Low floor



➤ Mexico: Artic buses & Trafic contr/Pass info

➤ Göteborg: Bi-Artic with low floor

