



# METROBUS

## Brescia - Italy, 1999

### PROJECT CHARACTERISTICS

**Works:** trunk line of an automatic LTR (Light Rapid Transit) railway. The line runs partly in a tunnel, partly in a cut-and-cover section and for about half of its length above ground surface on a viaduct. Stations, service buildings, lighting and ventilation systems.

**Purpose:** new public transport system for Brescia city aimed at reducing commuting times while vehicular traffic downtown.

### Dimensions:

- *Line length:* 18,0 km
- *Length of underground tunnel:* 5,5 km
- *Length of cut-and-cover tunnel:* 1,65 km
- *Tunnel cross section:* 49,64 m<sup>2</sup>
- *Viaduct length:* 10,90 km
- *Outdoor stations:* 13
- *Underground stations:* 10
- *Project cost:* 475 000 000 US \$
- *Passenger:* 7 600 to 12 000 one-way passengers/hr
- *Ave. speed:* 37 km/h
- *Train frequency:* 90 seconds
- *Train capacity:* 230/300 passengers
- *Yard buildings:* 80 000 m<sup>2</sup>



### PROFESSIONAL SERVICES OFFERED

In association with Amberg Ingenieurbüro: tender design for a design-and-build contract, to be partly (75%) financed by the Central and Regional Governments. The design included: analysis of the city environment, of nodal points, of traffic flows and of road network. Lay-out selection minimizing the interferences with the existing road system, with historical monuments and with archaeological pre-existences. Detailed design and stability analyses of tunnel and precast liner. Design and stability analyses of the viaduct in modular precast structures, jobsite organization study, ventilation diagrams, quantities take-off, construction plan, costs evaluation. All drawings have been made using DTM and CAD 3D.

*Brescia LTR railway runs along the North-South axis from Concesio to Brescia 2 suburb, beyond which it forks, reaching toward the East S. Eufemia suburb and toward West the new Fair. The accesses to the underground in the downtown have been designed adopting a simple geometry and reduced volumes in order to fit the limited spaces and to be consistent with the buildings on the surface. Special care was paid to lighting, ventilation and safety systems.*

*The metrobus will be double track, wholly independent from normal traffic. Neither train staff nor station operators are requested to operate the LTR system. The automatic control system of all trains will be equipped with protections and automatic safety controls.*

