

# OMNEO

The ultimate breakthrough  
for high capacity comfort



Double-deck trains reinvented

**BOMBARDIER**

# ◁ Superior accessibility coupled with spacious open design ▷

**Combining excellent accessibility, double-deck capacity and a spacious, comfortable passenger interior seemed an impossible challenge, yet the BOMBARDIER\* OMNEO\* train exceeds expectations.**

High capacity double-deck trains are the recognized solution to the issue of overcrowded routes, particularly when platform extension is not an option. However, operators have had to compromise between capacity, accessibility and comfort. Until now, they also had to forego the option of visibility throughout the train, though it is key to ensuring passengers feel safe and secure.

The OMNEO train is the world's first articulated double-deck multiple unit. This technological breakthrough provides an extra wide carbody, wide gangways and superior accessibility, and, for the first time, the benefit of visibility throughout the train.

#### **Accessibility for passengers with restricted mobility**

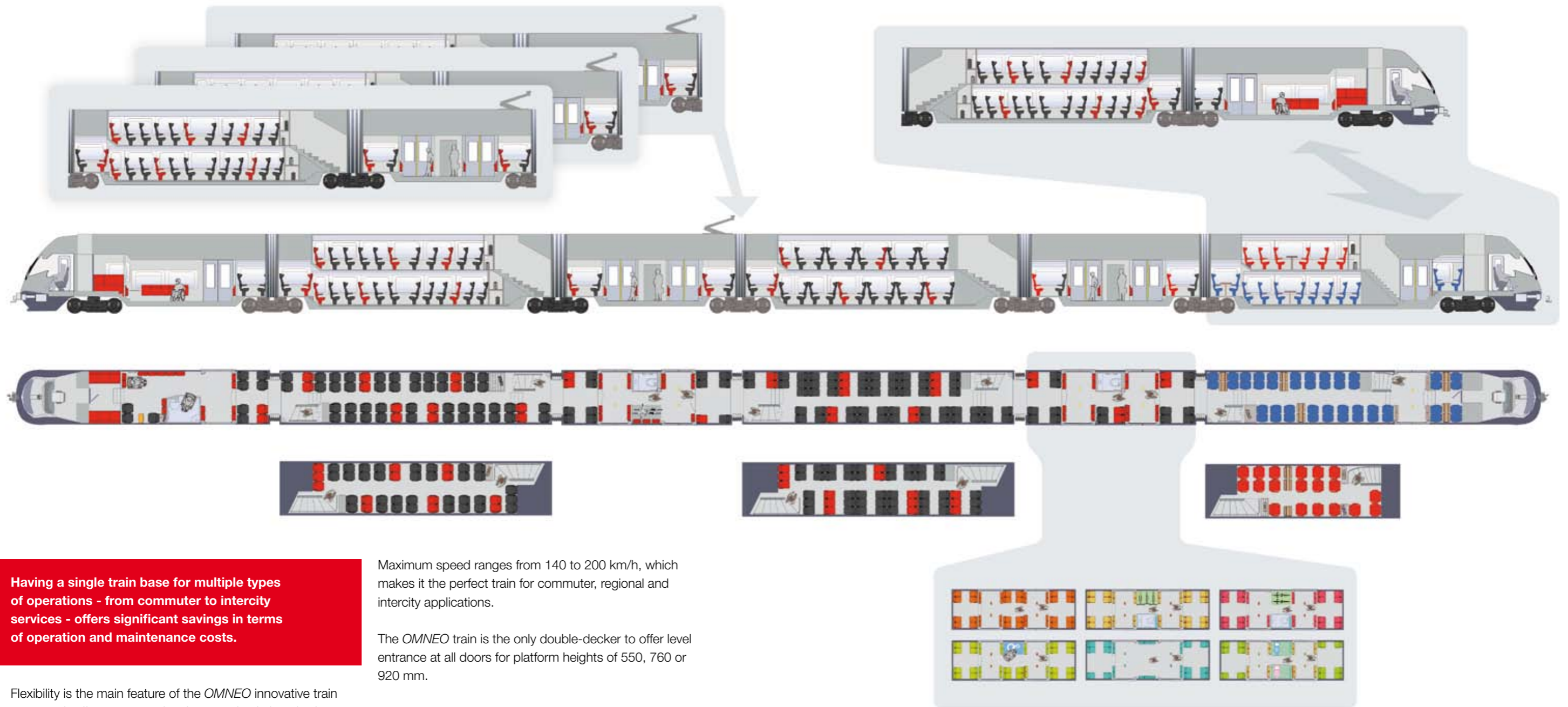
Fully compliant with TSI accessibility requirements for disabled people, the OMNEO train also offers platform level entrances at all doors to facilitate the access for passengers in wheelchairs. All cars offer a dedicated area for priority passengers together with adjacent seats for accompanying persons. A universally adapted toilet for wheelchair users is situated in the front car.



The OMNEO train offers maximum modularity. All doors offer level entrances adaptable to platform heights of 550, 760 or 920 mm.



# ◁ Full Flexibility for Operators' Needs ▷



**Having a single train base for multiple types of operations - from commuter to intercity services - offers significant savings in terms of operation and maintenance costs.**

Flexibility is the main feature of the *OMNEO* innovative train concept. It offers an exceptional range of train lengths from 81 m upwards with increases in increments of 10 to 15 m. Moreover, additional intermediate cars can be added during the lifetime of the train.

Maximum speed ranges from 140 to 200 km/h, which makes it the perfect train for commuter, regional and intercity applications.

The *OMNEO* train is the only double-decker to offer level entrance at all doors for platform heights of 550, 760 or 920 mm.

Light-weight vehicle construction combined with excellent weight distribution minimises axle load and creates flexibility for multi-voltage cross-border versions on all European networks.

# ◁ The ultimate sense of space and comfort

## An extra wide train with high visibility ▷



2+3 seating arrangement

The articulated double-deck design of the *OMNEO* train caters for the various travel requirements of passengers, permitting both ease of circulation in designated areas, whilst assuring superior comfort with the provision of extra-wide seating.

### Panoramic windows with integrated armrest

Panoramic windows with elegant narrow frames add to the feeling of internal spaciousness. The innovative air inflow system has been integrated in the ceiling, freeing up space along the sidewalls. It is therefore also possible to select a 2+3 seating arrangement in order to provide additional seats for commuter and regional services.



2+1 seating arrangement

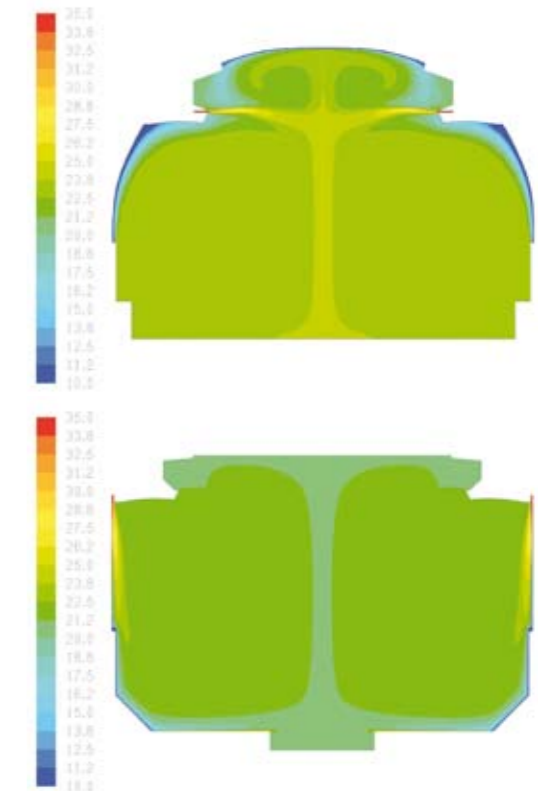
### 2.99 m width means more space on board

With a carbody width of 2.99 m, the *OMNEO* train provides seats that are 15% wider than in a conventional double-deck train - a real plus towards passenger comfort. This allows to provide seats of 580 mm width at shoulder height, fitted with separate armrests on either side and a shared intermediate armrest, whilst retaining generous 600 mm wide corridors.



### New advance in thermo efficiency

Through its *ECO4* technologies, Bombardier created a major advance in energy efficient heating, ventilation and air conditioning systems (HVAC). The *OMNEO* train features an advanced air inflow system in combination with floor heating to create a new standard of internal comfort. Temperature levels throughout the passenger compartment are so consistent that passengers find a lower interior temperature more comfortable.



### A tranquil environment

Double layer gangways filter out practically all noise, ensuring minimum noise levels in the double-deck seating area. Vestibule doors in the intercity version improve the acoustics even further.

# Exceptional capacity

## A solution to high density services

Building new tracks or extending platforms requires significant capital investment. The **OMNEO** train creates an economic solution to increased capacity.

### 5 seats per metre of train

A full second class **OMNEO** train with a 2+2 seating arrangement achieves an impressive ratio of 5 seats per

metre of train with seat spacing of 825 mm between uni-directional seat rows and 1,750 mm between face to face rows. A 2+3 seating arrangement can increase this ratio to 5.8 seats per metre of train.

The interior layout based on rail mounted seats makes it easy to change from a 2+2 to a 2+3 seating arrangement during the life of the train in order to meet increasing capacity needs.



2+2 seating arrangement

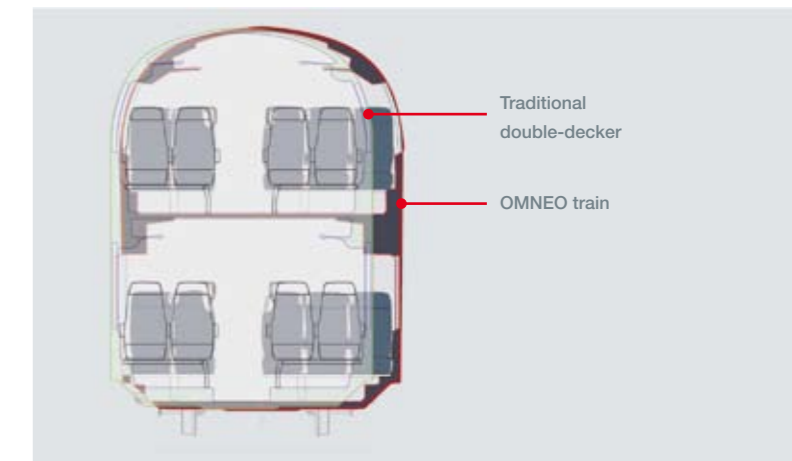


2+3 seating arrangement

### 2+3 seating with full comfort

2+3 seating is common in many countries with wide gauge vehicles such as Scandinavia. However, this solution is seldom used in continental Europe due to the UIC gauge that limits the double-deck vehicle width to 2,800 mm. The **OMNEO** train is 2,990 mm wide. Bombardier has integrated the armrest within the window, and designed a unique ceiling air inflow system, generating a generous internal space. This extra space allows 2+3 seating with 490 mm width at shoulder height and 550 mm corridor width. As a result, the **OMNEO** train can incorporate 2+3 seating without compromising all the usual comfort of a traditional double-deck vehicle.

The **OMNEO** train then provides up to 35% more seating than classical double-deck trains.



OMNEO train for France Technical characteristics	Short	Medium	Long	Extra Long	V200 Intercity
Multiple Unit Operation	UM3	UM3	UM3	UM3	UM3
Gauge	UIC 505-1	UIC 505-1	UIC 505-1	UIC 505-1	UIC 505-1
Length between couplers (m)	80.9 to 84.5*	93.2 to 95*	108.2 to 109.9*	133.6 to 135.4*	109.9
Height (m)	4.32	4.32	4.32	4.32	4.32
Width of single deck vehicles (m)	3.05	3.05	3.05	3.05	3.05
Width of double-deck vehicles (m)	2.99	2.99	2.99	2.99	2.99
Power at rail (MW)	2.4	2.4	2.4 or 3.2	2.4 or 3.2	2.55
Top speed (km/h)	160	160	160	160	200
Level entrance from platform height of (mm)	550 / 760 / 920	550 / 760 / 920	550 / 760 / 920	550 / 760 / 920	550 / 760 / 920
Number of doors/side	6	6	8	10	8
Door width (m)	1.6	1.6	1.6	1.6	1.6
Seated capacity incl. tip-up 2+2 / 2+3 seating	360 to 390* / 410 to 450*	435 to 450* / 500 to 520*	515 to 530* / 595 to 615*	650 to 670* / 760 to 780*	485 / -
Total capacity (4 pass/m <sup>2</sup> ) 2+2 / 2+3	680 to 730* / 720 to 775*	800 to 825* / 850 to 880*	955 to 980* / 1,020 to 1,050*	1,210 to 1,230* / 1,290 to 1,320*	- / -
Number of toilets (incl. 1 for wheelchair user)	3	3	4	5	7
Axle load CN0 / CN4 / CE (t)	17.5 / 19 / 20	17.5 / 19 / 20	17.5 / 19 / 20	17.5 / 19 / 20	17.5 / 19 / 20

\* Depending on intermediate double-deck coach length (13,695 mm or 15,445 mm)

# eco<sup>4</sup>

## The Climate is Right for Trains

The **OMNEO** train concept, combined with the **Bombardier** portfolio of environmental technologies allows operators to achieve a step-change in efficient passenger transportation.

### MITRAC Permanent Magnet motor

The **BOMBARDIER**\* **MITRAC**\* Permanent Magnet Motor saves energy directly with increased motor efficiency as well as indirectly with reduced vehicle weight. Further environmental benefits are achieved as a larger proportion of the braking is performed electrically, resulting in reduced energy consumption and noise emission. Moreover, the **OMNEO** train offers single stage gear boxes, further reducing losses in the traction chain.

### EBI Drive 50 Driver Assistance System

**BOMBARDIER**\* **EBI**\* Drive 50 is a tool intelligently combining the goals of punctuality and energy saving. It generates recommendations to the driver for optimised speed and traction force. **EBI** Drive 50 uses real-time remote data transfer on actual position, track information, speed and time compared to timetable. Traction energy savings of up to 15% have been proven in various test trials with customers in different countries. Smoother operation also results in reduced wear of wheelsets, engines, brakes and tracks.

High Power Regenerative Braking

AeroEfficient Optimised Train Shaping



EBI Drive 50 Driver Assistance System

Lightest Train per Passenger

Energy Management Control System

ThermoEfficient Climatisation System

### Energy Management Control System

"If you cannot measure it, you cannot improve it". Energy management is an end-to-end concept, ensuring an integrated approach: from data logging and file transmission, via data analysis and report. It includes smart management of auxiliary loads in the train.

### AeroEfficient

State-of-the-art aerodynamic computer modelling used to optimise the **BOMBARDIER**\* **ZEFIRO**\* 380 very high-speed train also supported aerodynamic improvements on the **OMNEO** train concept.

### ThermoEfficient

After traction, HVAC has the highest energy consumption on a train. The ThermoEfficient climatisation system not only offers significant energy savings, it also optimises passenger comfort through variable fresh air rate and even temperature levels.

High Efficiency Gear

MITRAC Permanent Magnet Motor

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