OMNEO
The ultimate breakthrough for high capacity comfort

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

Superior accessibility coupled with spacious open design

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.
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.

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.

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.
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.

2.99 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.

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.

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.
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 unidirectional 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.

Exceptional capacity
A solution to high density services

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

<table>
<thead>
<tr>
<th>Multiple Unit Operation</th>
<th>Short</th>
<th>Medium</th>
<th>Long</th>
<th>Extra Long</th>
<th>V200 Intercity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gauge</td>
<td>UIC 505-1</td>
<td>UIC 505-1</td>
<td>UIC 505-1</td>
<td>UIC 505-1</td>
<td>UIC 505-1</td>
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<tr>
<td>Length between couplers (m)</td>
<td>66.3 to 84.5*</td>
<td>59.2 to 95*</td>
<td>108.2 to 109.4*</td>
<td>133.6 to 135.4*</td>
<td>109.9</td>
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<tr>
<td>Height (m)</td>
<td>4.32</td>
<td>4.32</td>
<td>4.32</td>
<td>4.32</td>
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</tr>
<tr>
<td>Width of single deck vehicles (m)</td>
<td>3.05</td>
<td>3.05</td>
<td>3.05</td>
<td>3.05</td>
<td>3.05</td>
</tr>
<tr>
<td>Width of double-deck vehicles (m)</td>
<td>2.99</td>
<td>2.99</td>
<td>2.99</td>
<td>2.99</td>
<td>2.99</td>
</tr>
<tr>
<td>Power at rail (MW)</td>
<td>2.4</td>
<td>2.4</td>
<td>2.4 or 3.2</td>
<td>2.4 or 3.2</td>
<td>2.55</td>
</tr>
<tr>
<td>Top speed (km/h)</td>
<td>200</td>
<td>200</td>
<td>200</td>
<td>200</td>
<td>200</td>
</tr>
<tr>
<td>Level entrance from platform height (mm)</td>
<td>550 / 760 / 920</td>
<td>550 / 760 / 920</td>
<td>550 / 760 / 920</td>
<td>550 / 760 / 920</td>
<td>550 / 760 / 920</td>
</tr>
<tr>
<td>Door width (m)</td>
<td>1.6</td>
<td>1.6</td>
<td>1.6</td>
<td>1.6</td>
<td>1.6</td>
</tr>
<tr>
<td>Seated capacity incl. tip-up 2+2 / 2+3 seating</td>
<td>680 to 730* / 720 to 775*</td>
<td>800 to 825* / 850 to 880*</td>
<td>955 to 980* / 1,020 to 1,050*</td>
<td>1,210 to 1,230* / 1,260 to 1,320*</td>
<td>485 / -</td>
</tr>
<tr>
<td>Total capacity (4 persons/m²) 2+2 / 2+3</td>
<td>3</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>7</td>
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<tr>
<td>Axle load CN0 / CN4 / CE (t)</td>
<td>17.5 / 19 / 20</td>
<td>17.5 / 19 / 20</td>
<td>17.5 / 19 / 20</td>
<td>17.5 / 19 / 20</td>
<td>17.5 / 19 / 20</td>
</tr>
</tbody>
</table>

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

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® ZEFRO® 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.

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

The Climate is Right for Trains
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