COMPLETE SERVICE EXPERTISE: Production, Testing and Maintenance

Bombardier Transportation is a world leader in delivering turnkey transportation systems. We offer the broadest portfolio in the industry and deliver innovative products and services that set new standards in sustainable mobility.

CENTRE OF COMPETENCE FOR MASS TRANSIT (CoC MT)

At the heart of the Centre of Competence for Metro, Monorail and Energy Management technologies in Kingston, Ontario, is a full-service testing and maintenance facility.

This facility has been testing and commissioning state-of-the-art rail transportation systems and projects since it opened in 1978. Staffed by a highly skilled team, this world-class facility features four test tracks that enable full qualification testing of mass transit products at speeds up to 100 km/h.

Our impressive 1,858 m² workshop, which is fitted with five maintenance bays including three with pits, provides ample space to assemble, test, commission and maintain transportation vehicles.

With over 30 years of experience, we are testing experts. Our focus is to achieve flawless execution of each project, at every step of the way. We are equipped to undertake a broad range of tasks – from vehicle performance verification to strain gauge fatigue. The instrumentation laboratory is stocked with over 400 measuring tools and test equipment, including static and dynamic testing tools, and portable equipment for ease of field use.
Quality and Excellence
Through our dedication to quality and excellence, we have achieved certification with key international management systems, including International Organization for Standardization (ISO), Occupational Health & Safety Advisory Services (OHSAS) and Integrated Risk Information System (IRIS), as well as Capability Model Integration (CMMI) Level 3.

We promote a customer-centric culture that emphasizes outstanding service and meets commitments at every level of our organization. Our full range of testing capability is supported by our proven expertise in project management, system engineering and integration, signalling technologies, project financing, and operations and maintenance (O&M).

Our Five Core Systems Engineering Activities at Centre of Competence
• Electrical and mechanical system design
• BOMBARDIER* INNOVIA* Metro technology with linear induction motor (LIM) propulsion
• INNOVIA Monorail technology
• BOMBARDIER* EnerGstor* wayside energy management technology
• Qualification testing for rolling stock and wayside equipment

WHY USE OUR TESTING SERVICES?
• We save customers money by using our pre-existing equipment during the testing phase instead of investing significant capital in new equipment
• We customize testing routines for each customer
• Our services are flexible and include onsite and offsite testing
• We are a unique and multi-faceted specialized facility with dedicated trained professionals in each field onboard, which eliminates the need to provide special training during any start-up
• Our test tracks include alignment features that simulate the challenges of actual systems, such as tight curves and steep grades
• We are capable of measuring a wide variety of physical parameters under both static and dynamic conditions, including ride quality, noise and vibration, acceleration, energy consumption and more
• We provide employee training in operations and maintenance, testing and commissioning, and driving during the vehicle testing phase
• Above all, our standards are high, we are committed to excellence and we deliver
INNOVATIVE TECHNOLOGIES
From an Industry Thought Leader

As a thought leader in the transportation industry, we are at the forefront of technology development. Our innovative wayside solutions complement our rail products and improve the performance of the complete transportation system.

AUTOMATIC TRAIN CONTROL (ATC)

Modern, computer-based signalling systems are vital to the control and supervision of today’s transportation networks. At our test facility, we provide full demonstration of our latest ATC technologies for both urban and long haul applications.

**BOMBARDIER® CITYFLO® 250**

Designed primarily for light rail transit and metro systems, cab signalling uses onboard automatic train protection (ATP) with signal aspects displayed in the driver’s cab and provides track-to-train communication via balises.

**CITYFLO 650**

Our computer-based radio-controlled, moving-block ATC system is widely used for driverless and unattended metro, rapid transit, people movers and regional commuter systems. It’s simple, reliable, contactless train-to-wayside communications systems permit shorter, more consistent headways.

**INTERFLO 150**

This radio-based moving-block system was designed for the needs of the industrial and freight railroad operators to increase capacity and improve fluidity and safety, while reducing operating costs. It is suitable when more sophisticated operation functions are required to meet an increase of capacity.

ENERGY MANAGEMENT

As part of our commitment to being a responsible corporate citizen, we place environmental sustainability – along with design and innovation – firmly at the top of our agenda.

**EnerGplan**

Our graphic-based simulation tool allows the transit system designer to analyze and optimize the power system configuration and minimize the energy consumption of the complete transportation system.

**EnerGstor**

Using recycled energy reduces ongoing operation costs and increases the system’s energy efficiency. EnerGstor, a wayside energy storage system based on supercapacitor technology, captures and stores the otherwise unusable regenerated braking energy and recycles it back into the system. Developed and implemented at our Centre of Competence for Energy Management in Kingston, the heavy-rail metro test track is fitted with the EnerGstor solution to demonstrate its effectiveness and use during dynamic testing.

EnerGstor wayside energy storage system
Transit Security

By design, public transportation systems serve a high volume of people through multiple access points in a large geographic area. We offer security solutions that help transit authorities provide system-wide security for passengers while protecting their property and assets.

**SEKURFLO**

More than just CCTV, this train-based security solution provides real-time, end-to-end situation awareness and contextual information that allows operators to respond to events promptly. *SEKURFLO* was designed and tested from the ground up for use in the transit environment and may be installed new or existing vehicles.

**Guideway Intrusion Detection System (GIDS)**

This wayside security system can detect if people, animals or debris enter or fall onto the guideway. The approaching vehicle safely stops immediately before an incident can occur, providing increased safety for passengers and protection to the train and its infrastructure. Developed locally by Bombardier’s team, our mediumcapacity metro system test track is fitted with GIDS technology.

**We Are Part of a World Wide Network**

Systems in 18 Countries

- Australia
- Brazil
- Canada
- China
- Germany
- Italy
- Malaysia
- Philippines
- Portugal
- Saudi Arabia
- Singapore
- South Africa
- South Korea
- Spain
- Taiwan
- Turkey
- United Kingdom
- United States

**Reference Projects:**

- 1985 - Scarborough Rapid Transit (Canada)
- 1986 - Vancouver Expo Line (Canada)
- 1987 - Detroit People Mover (USA)
- 1991 - Tampa Airport Monorail (USA)
- 1994 - Washington DC Senate Line (USA)
- 1997 - Ankara Metro (Turkey)
- 1999 - Kuala Lumpur Kelana Jaya Line (Malaysia)
- 2000 - Jacksonville Skyway Monorail (USA)
- 2002 - Vancouver Millennium Line (Canada)
- 2003 - AirTrain JFK Airport (USA)
- 2004 - Las Vegas Monorail (USA)
- 2008 - Beijing Airport Express (China)
- 2009 - Kuala Lumpur Extension (Malaysia)
- 2010 - Vancouver SkyTrain Expansion (Canada)
- 2013 - Yongin Everline (Korea)
- 2015 - São Paulo Expresso Tiradentes (Brazil)
- 2015 - Vancouver SkyTrain Expansion (Canada)
- 2016 - King Abdullah Financial District (Saudi Arabia)
- 2017 - Kuala Lumpur Expansion (Malaysia)
TEST TRACK OVERVEIW

Through our four different test tracks we are able to provide testing services to a range of rail vehicles and transit technologies.

MEDIUM CAPACITY METRO VEHICLES

Vancouver SkyTrain vehicle on a 3% grade

Our flagship test track, built in 1978, is a 2.3 km continuous oval loop, encircling a central control tower that allows for a 360° view. The track features 3% and 6% grades and a section of elevated guideway. Complete with a full-scale station, the system includes 35 m and 200 m curves, as well as complicated switches and flying frogs. Equipped for Bombardier’s linear induction motor technology, the standard gauge test track can also serve conventional rail vehicles without impediment. A power change of 540 V to 750 Vdc is supplied through third rail or fourth rail distributions depending on the vehicle.

HEAVY RAIL METRO VEHICLES

Adjustable gauge of track accommodating the Toronto subway cars

In 2009, a conventional heavy rail metro test track was commissioned into service in Kingston. Our 2.1 km line features an adjustable track to accommodate a range of customer truck gauges. Designed with the option of extending the track into a full oval, the current alignment includes both tangent and 75 m curves. A third rail distributes power from a wayside 3 megawatt substation, which is shared with the monorail test track. Serving also as an overnight vehicle storage barn, the end-of-line maintenance facility is equipped with a full loading ramp and maintenance bay.
Our challenging light rail vehicle test track was opened in 1982. Designed from the beginning to rigorously test the flexibility, durability and performance of street-running vehicles, the system provides thorough preoperation and qualifying trials. This traditional tie and ballast track is standard gauge. It features tight horizontal and vehicle curves, including a unique 17 m long ‘S’ curve, as well as 2% and 4% grades. There is also a conventional 31 m curve to demonstrate typical systems. The 1.3 km alignment uses overhead catenary power supply.

Scheduled to open in 2012, our new monorail test track includes its own maintenance and testing facility. Comprised of 169 sections, the 1.9 km guidebeam is 690 mm wide. Featuring low-speed (400 m) and high-speed (1.5 km) testing areas, the track includes a 2% vertical curve and 340 m horizontal curve, as well as a 45.7 m curve – the tightest curve radius in the monorail segment. Powered by 750 Vdc, the vehicle can operate at speeds exceeding 90km/h. To simulate real world operation, the test track contains a simulated pivot switch and crossover beam.

The tight curves of the light rail test track

Monorails for Brazil and Saudi Arabia began testing in 2013
Bombardier Transportation has an active set of environmental print guidelines, for further details click onto:

www.transportation.bombardier.com

Learn more about our commitment to sustainable mobility on:

www.theclimateisrightfortrails.com

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