

DESIGN AND DEVELOPMENT OF THE MPM-10 MÉTRO CAR MODEL

JUNE 2012

THE DESIGN OF THE MPM-10 (WHICH STANDS FOR MONTREAL PNEUMATIC MATERIAL ORDERED IN 2010) MÉTRO CARS IS OF MAJOR IMPORTANCE TO THE SOCIÉTÉ DE TRANSPORT DE MONTRÉAL (STM). THESE NEW CARS WILL SIGNIFICANTLY IMPROVE THE CLIENT EXPERIENCE, NAMELY THROUGH INCREASED COMFORT AND STATE OF THE ART INFORMATION SYSTEMS. THIS 21ST CENTURY ROLLING STOCK WILL PROVIDE A HIGH-PERFORMANCE, SAFE AND PRACTICAL TRANSPORTATION SERVICE.

USEFULNESS OF MODELS

To support the design and development process for the MPM-10 cars, the STM is using full-scale models that reproduce the simulated systems as accurately as possible by integrating the majority of its components. The models serve to validate a number of aspects, including:

- Conformity with technical requirements;
- Three-dimensional layout;
- Access to various equipment;
- Human-machine interfaces;
- Design criteria;
- Choice of materials
- Disassembly and replacement of components.

DESIGN PROCESS

The manufacturer of the MPM-10 train, the Bombardier-Alstom Consortium, is working with professionals who have solid expertise in cognitive ergonomics and industrial design. Since the start of the project, they have worked on the definition and evolution of the overall concept for the passenger compartment designed by Labbé Designers et associés during the project's initial phase. The overall design concept shows the results expected by the STM for the final product to be delivered by the Consortium. Since the contract was awarded in fall of 2010, various full-scale models were used to ensure that the final product meets the needs of our customers.

PASSENGER COMPARTMENT

The overall concept for the interior layout was firmed up in summer of 2011 with a first scale-model of the passenger compartment made of wood and cardboard. The model was tested by target groups including transit users, people with functional limitations and STM employees. The MPM-10 project office was thus able to validate a number of design aspects, such as the exact dimensions of the seating areas, standing areas, doors and windows, the profile of the seats (tested and selected by clients in spring of 2011), the

“warmth” of the lighting, the integration of the communications systems and the positioning and height of the emergency brake handles, interphones and support poles.

The train car on display today features these validated aspects and components and represents the passenger compartment's latest full-scale model. It was recently used by the project team to validate decisions made during the design phase and will be used as a template for production of the first car.



BOGIES

Bogies are the wheel assemblies that support métro cars. They mainly consist of running wheels, guide wheels, safety wheels and, in most cases, traction equipment used to propel the cars. Equipped with a pneumatic suspension offering a smoother ride, they ensure greater passenger comfort. The bogies on the MPM-10 métro cars are very similar to the MP89 and MP05 bogies already in use on several Paris metro lines. The MP05 bogie will be adapted to include the famous wooden brake shoes

manufactured by the STM using yellow birch. These brake shoes ensure quieter braking and prevent any premature wear of the steel safety wheels. The illustration shows the MP05 bogie to which we have added wooden models that represent the braking system adapted to the wooden shoes.

