



# Backgrounder

*Spring 2009*

## An All-Canadian Rail Innovation from Roof to Wheels

### **ABOUT THE TRAINS:**

VIA's Light, Rapid and Comfortable (LRC) trains represent one of the most innovative chapters in the history of North American rail travel – completely Canadian in concept, design and construction.

The LRC was conceived in 1968 by a consortium of Dofasco, Alcan and Montreal Locomotive Works (later Bombardier). One inspiration was a Canadian Transport Commission study on the future of passenger transportation that found “the most profitable strategy to adopt involves maximizing the potential of existing railway facilities through the introduction of new vehicle technology.”

The LRC would be an aerodynamically streamlined and lightweight train using service-proven subsystems and operating techniques. It would not require all-new facilities, rail lines or other expensive infrastructure upgrades, but would be capable of 200 km/hour operation on existing lines shared with freight trains.

The LRC development project – supported by the Government of Canada – produced a prototype diesel locomotive and coach in 1972 that were tested extensively under a wide range of operational and climatic conditions. They met all expectations, setting a Canadian speed record of 208 km/hour on a test run on March 12, 1976. The sturdy monocoque, aluminum alloy coaches were particularly noteworthy, weighing one-third less than conventional rolling stock then in use.

VIA and the Government of Canada placed two LRC orders in 1978 and 1981 for a total of 31 locomotives and 100 cars for fast, frequent and improved service throughout the Quebec-Windsor Corridor. The LRC was the first new equipment ordered by VIA following its creation as a Crown corporation on January 12, 1977.

With extensive refinement by VIA's engineering staff, the LRC coaches and business class cars have become the mainstays of VIA's corridor services since their introduction in 1981. The locomotives were not as successful and have been retired. LRC trains are now hauled at up to 152 km/hour by VIA's 21 high-performance General Electric Genesis locomotives or 54 General Motors F40 diesels. The latter are now undergoing a \$100 million overhaul to increase their environmental and economic efficiency, and extend their operating lives.

A major achievement of the LRC design was the interior styling, undertaken through an international competition sponsored by Transport Canada. The LRC broke with railway tradition by providing passengers with at-seat food and beverage service provided from all-electric galleys and carts. The LRC also featured panoramic tinted windows, a public address system, electrical heating and air conditioning systems, overhead reading lights, specially-designed reclining seats and a soothing beige-and-brown scheme for carpeting, upholstery and wall panels.

Today, VIA operates 72 LRC Economy class coaches, which seat 68 passengers, and 26 Business class cars, with seating for 56, on trains throughout its Quebec-Windsor Corridor.

## **ABOUT THE PROJECT:**

The contract awarded to Industrial Rail Services, Inc. (IRSI) of Moncton, New Brunswick, totals nearly \$100 million and will completely overhaul VIA's 98 LRC cars to provide even more comfortable and efficient service levels than when first delivered. The project builds on the knowledge gained and the improvements implemented through the LRC's millions of kilometers of service and will upgrade them with technological advances made since their construction more than two decades ago.

The LRC overhaul began as a prototype project in 2005-2007 in which VIA staff disassembled business class car 3451, assessed the integrity of the carshell and each sub-system, and then installed all-new or fully refurbished components for service testing. This intense investigation proved that overhauling the LRC cars for greater efficiency and comfort would provide benefits on a par with buying new equipment.

Overhauling the LRCs will cost about \$1 million per car and the first will be delivered within one year. There is currently no suitable North American intercity passenger car design that VIA could purchase "off the shelf" from any manufacturer. Developing such a car would take up to four years, require extensive testing and debugging, and cost about \$4-5 million per car.

Designed for a 20-year operating life, the LRCs have proved more durable than even their creators suspected. The earliest cars are now approaching 30 years and have reliably provided millions of kilometres of service. The sturdy carshells and many other sub-systems are structurally sound and this overhaul will prepare them for up to 20 additional years of safe and productive service.

The LRCs will be moved to the IRSI Moncton facility for complete disassembly and stripping of all reusable and recyclable components. Rather than being wastefully scrapped, the trucks, wheelsets, couplers, drawbars and intercar diaphragms will be completely reconditioned. Any corrosion will be repaired from the aluminum alloy carshells and a protective anti-corrosion treatment applied.

A key objective of the LRC overhaul project will be an increase of at least 20 per cent in energy efficiency through reduced electrical requirements. This will be done with smaller and more energy-efficient wiring, LED lighting, nickel cadmium batteries, advanced microprocessor controls, the elimination of obsolete and inefficient relays and switches, high-efficiency linear motors for automatic door operation and the installation of a state-of-the-art "smart" heating and air conditioning (HVAC) system. An environmentally-friendly, water-based cleaning system will flush the air conditioning condensers in the maintenance facilities during servicing to keep them operating at peak efficiency.

The new HVAC system divides the cars into four separately-controlled zones. Sensors and microprocessors will automatically reduce the overall interior temperature in the winter or increase it in the summer if the cars have not moved, or there has been no interior movement for a certain number of minutes, or when they are receiving external power in stations or yards.

Removal of the banking system will reduce maintenance costs without affecting top speed or passenger comfort, as well as cut the LRC's weight by two tonnes per car and reduce fuel consumption. As well, the concurrent overhaul of VIA's fleet of 54 F40 diesel-electric locomotives will see many obsolete components replaced with advanced, more efficient equivalents. The overhauled F40s and LRCs will improve energy efficiency, reduce fuel consumption and emissions, and decrease VIA's already low environmental footprint.

Improved comfort and accessibility are at the forefront of VIA's LRC overhaul project. The seats will be completely reconditioned and new upholstery applied. Business class seats will now be leather. Brighter interior colours, new windows and individual curtains will give the LRCs a totally new look. Washroom facilities will be fully modernized. The food service galleys will be refurbished with better lighting and high-efficiency appliances capable of remote monitoring of the refrigerators to assure that food temperatures are properly maintained.

Twenty-six of the LRC coaches will be provided with larger, fully-accessible washrooms. Ten percent of the seats in each of these accessible cars – one for each LRC train consist – will have flip-up armrests to provide easier access and a generous amount of space for passengers with special needs travelling with a service animal or care provider. In addition, tactile markers will indicate seat numbers for the visually-impaired.

The final touch in the overhaul of VIA's LRC fleet will be the application of a new green, silver and gold exterior paint scheme. Service testing will follow. The first better-than-new LRC cars will arrive in May 2010. Cars will be delivered at the rate of two per month until all 98 cars are in service by December 2013 at the latest.

**ABOUT THE PROJECT'S BENEFITS:**

The LRC overhaul project will create 100 jobs at the IRSI in Moncton and 552,000 person hours of employment. As well, this and the concurrent work to increase the accessibility of VIA's Renaissance fleet will create another 50 jobs at IRSI's associated companies and suppliers throughout Canada.

**ABOUT INDUSTRIAL RAIL SERVICES, INC:**

Industrial Rail Services, Inc. (IRSI) of Moncton, New Brunswick, is a full-service locomotive and passenger rail car facility specializing in equipment repairs, remanufacturing, modifications and refurbishment. Since its founding in 1999, IRSI has become North America's premier rebuilder of rail passenger equipment, strengthening Moncton's reputation as a global rail centre of excellence for more than a century.

IRSI's modern and well-equipped facility is located in the CN Gordon Yard on the eastern transcontinental main line. Its 125,000-square-foot facility is equipped with 18 exhausted service bays, overhead cranes, drop tables, tool cribs, designated stores and document control areas, a metal fabrication shop, training facilities, a wash bay and a new 100-foot, state-of-the-art paint shop. The strength of IRSI is its highly skilled and dedicated workforce, whose craftsmanship is recognized throughout the rail industry and has earned the company certification by the Association of American Railroads.

**ABOUT VIA RAIL CANADA:**

As Canada's national rail passenger service, VIA Rail Canada's mandate is to provide efficient, environmentally sustainable and cost-effective passenger transportation services, both in Canada's business corridor and in remote and rural regions of the country. Every week, VIA operates 503 intercity, transcontinental and regional trains that link 450 communities across its 12,500-kilometre route network.

The demand for VIA services is growing as travellers increasingly turn to train travel as a safe, hassle-free and environmentally responsible alternative to congested roads and airports. In 2008, VIA safely transported 4.6 million passengers – the most since 1989 – and set an all-time record of \$299 million in revenue.

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