



# **PUBLIC CALL FOR INTEREST**

## **PILOT PROJECT SLOW-CHARGE ELECTRIC BUS**

February 2011

SOCIÉTÉ DE TRANSPORT DE LAVAL  
2250, avenue Francis-Hughes  
Laval (Québec) Canada H7S 2C3

## TABLE OF CONTENTS

	Page
1 INTRODUCTION .....	3
2 OBJECTIVES .....	4
3 PROJECT PARAMETERS .....	5
4 GENERAL INSTRUCTIONS .....	6
5 POSSIBILITY OF A SUBSEQUENT PUBLIC CALL FOR TENDERS .....	8
6 REFERENCE DOCUMENTS FOR THE RESPONDENT .....	8
7 INFORMATION ON BUS USAGE AND WEATHER CONDITIONS .....	8
8 BUS CLEANING (INTERIOR AND EXTERIOR) .....	10
9 SUBMISSION INSTRUCTIONS .....	10
10 RESPONSE CRITERIA .....	10
APPENDIX 1 – RESPONSE TABLES – RESPONSE CRITERIA CONCERNING THE PURCHASE OR RENTAL OF A SLOW-CHARGE ELECTRIC BUS .....	12

# PREAMBLE

This project concerns the testing of slow-charge electric bus technology in a specific climate and urban context, i.e., that of the city of Laval, located in the province of Québec in Canada.

## 1 INTRODUCTION

The mission of the Société de transport de Laval (STL) is has the mission to ensure the mobility of the people on the territory of the city of Laval by mass transit means of transportation. In pursuing this mission, the STL operates a public bus transit corporation. This public transit corporation must provide Laval residents with a mass transit system that is reliable and that meets their growing needs. The STL serves over 20-million transit users per year on 42 bus routes, covering a territory of 245.84 square kilometers.

In the past ten years or so, public transit services on Laval territory has significantly diversified to meet not only ridership growth and modal split objectives, but also to respond to the development of sustainable transportation solutions. Between 1999 and 2009, many new services were implemented to fulfill the needs of the emerging residential, commercial and industrial sectors. In particular, these new services took the form of express lines, shared taxi routes, special lines for serving seniors' residences, more direct routes, etc. During this period of time, the STL's ridership increased over 25%.

In 2007, when the first three metro stations were opened in Laval, the STL revised its entire bus transit network, increasing it from 34 to over 40 routes, with more direct—and therefore faster—bus lines, in order to connect the major transit generators and to improve intermodality. In the fall of 2008, the STL's ridership went up over 6% compared to the same season in the previous year—a sign that the growth in the use of public transit is being maintained in Laval. The STL is confirming that it is staying the course of its ridership growth objectives.

Moreover, in 2007, the city of Laval conducted a study of greenhouse gas emissions (GGEs) on its territory. Based on the findings, over 60% of these GGEs come from the transportation sector. Just as the Federal and provincial governments recently recognized, with grant programs geared toward improving the supply of public transit services, the city of Laval has long invested more funds, in proportion, than the other Québec municipalities, in order to support the development of mass transit. Within this perspective, the STL has set itself the objective of seeking solutions to problems related to greenhouse gas emissions.

## **2 OBJECTIVES**

Environmental problems and, in particular, those related to GGEs, have changed the perception and vision of urban public transit. Initially perceived as a solution to accessibility problems and traffic congestion, public transit now needs to innovate in order to be in keeping with the expectations of ever-changing sustainable development. The fact that transportation is an important pollution factor shows how necessary it is to intervene in this process and to try and limit the short-, medium- and long-term impacts.

In general, public transit gives rise to major environmental, economical and social consequences: fuel costs, pollution-related costs and health-related costs, traffic congestion costs, etc. And even though public transit produces only 1% of all greenhouse gas emissions, it is of the utmost importance to try and reduce the ecological footprint of mass transit, because reducing these emissions hinges not only on a modal shift from single-passenger car usage to mass transit, but also on a rapid improvement in the use of urban buses. In fact, at the present time, manufacturers are investing colossal amounts of money to develop electric cars, and the gradual market penetration of these vehicles will soon relegate the buses to the category of environmental problems, if nothing is done to convert the diesel bus fleets to electrically-powered ones. In June 2010, the STL therefore made a public commitment to a ZERO-emission objective by 2030. Since the bus fleets are renewed every 16 years, only ZERO-emission vehicles would have to be purchased around 2014-2015.

In this context, the radical change from public transit operations based on the use of diesel fuel, to electrically-powered modes of transportation, is a big challenge. This challenge is characterized not only by vehicle-related changes and changes relating to the operating structure, but also, first and foremost, by changes in the *modus operandi* of the work crews. This choice to rapidly electrify the public transit network therefore implies the implementation of a project whose objective, in particular, will be to shed light on the various aspects related to electrification, and especially, to develop sufficient expertise in order to manage the introduction of electrically-powered buses into the STL's fleet.

The main objective of this public call for interest is to become better acquainted with the international electric bus market and to receive offers from companies that can potentially supply this type of bus, in accordance with the criteria specified hereinbelow, so that the STL can familiarize itself with, and evaluate, this technology for the specific climate and urban context in the city of Laval, within a pilot project.

### **3 PROJECT PARAMETERS**

The main parameters of the pilot project are as follows:

1. The minimal endurance (i.e., operating range) required for this electric bus pilot project is over 150 km, including air conditioning or heating, without having to recharge the batteries.
2. The slow recharging time must not be more than 4 hours for a complete recharge.
3. The project vehicle must be a low-floor bus, with an approximate length of 12 meters.
4. The maximum speed of the vehicle must be more than 60 km/hr.

This type of vehicle (slow-charge electric bus) must comply with applicable Federal and provincial legislation with regard to dimensions, weight and other parameters and/or equipment allowing the vehicle to be used on public roads. If the vehicle is not approved in Canada, it must at least meet the requirements for registration and freedom of

movement at all times on public roads, within the scope of a technology validation program.

The vehicle must be available for use, or be under development, and be delivered by November 1, 2011 at the very latest.

Moreover, the STL wants to know whether the suppliers are able to meet the criteria in the response tables in appendix. These criteria are directly related to the STL's operational and technical requirements and to legislation.

However, if any respondents would like to submit a presentation on an electric bus that doesn't meet the criteria set forth herein, they may submit a detailed proposal and will have to explain therein why the criteria required by the STL weren't met, provide their alternate solution as well as its advantages or disadvantages.

#### **4. GENERAL INSTRUCTIONS**

Respondents are invited to participate in this public call for interest on a purely voluntary basis and free of charge. Such participation is considered to be a strictly commercial effort on their part to promote products and services, and it is their responsibility to cover any related costs. The STL is not making any commitments to anyone, in any way, with regard to any follow-up to this public call for interest.

The STL reserves the right to use, for any purpose whatsoever, any or all information or documentation obtained within this call for interest. All suppliers responding to this call for interest that want to keep confidential certain aspects of their response to the call for interest must make express mention thereof. This whole process is subject to the provisions of the *Act respecting access to documents held by public bodies and the Protection of personal information* (a Canadian law).

Under no circumstances does the STL intend to make any commitment through this call for interest, which must not be interpreted as a call for tenders or an invitation for proposals.

**4.1** Responses to this call for interest must be addressed to:

**Mr. Aziz Rahhali**

**Société de transport de Laval**

**2250, avenue Francis-Hughes**

**Laval (Québec) Canada H7S 2C3**

**Telephone no.: 450-662-5400, extension 8379**

[arahhali@stl.laval.qc.ca](mailto:arahhali@stl.laval.qc.ca)

**by noon (local time in Québec, Canada) on March 18, 2011**, at the very latest.

The STL nevertheless reserves the right to accept responses after that date.

**4.2** The responses may be returned by email, or in duplicate by regular mail, including an electronic version.

**4.3** Respondents may obtain any information relating to this call for interest by emailing the person mentioned under section 4.1.

**4.4** Respondents are not entitled to any compensation relating to the expenses incurred to prepare their responses. In no way does the STL agree to select one or more suppliers as a result of this call for interest, nor to follow up on it in any way whatsoever.

**4.5** The STL reserves the right to communicate with one or more respondents to this call for interest in order to obtain further details.

**4.6** The STL would also like to have the opportunity, if it so desires, to visit the facilities of the manufacturer or operator (as the case may be) where the product sought by the STL is located. The conditions of the visit and the location must be specified.

## **5. POSSIBILITY OF A SUBSEQUENT PUBLIC CALL FOR TENDERS**

**5.1** As a result of more in-depth knowledge of the market, the STL might issue a public call for tenders. Information on this call for tenders will be available on the SEAO website. Nevertheless, the STL reserves the right not to proceed with such a subsequent public call for tenders.

**5.2** Should the STL issue a public call for tenders, the criteria for determining the successful bidder will be clearly stated in the call for tenders document produced for this purpose and may be different from the criteria specified herein or at any other time.

## **6. REFERENCE DOCUMENTS FOR THE RESPONDENT**

**6.1** The information contained herein is provided as a reference for the suppliers in order for them to prepare their responses to this call for interest. The STL may nevertheless agree to provide further information upon request. Anyone interested in this regard must consult the SEAO website (<https://www.seao.ca>) on a regular basis to obtain any updates on this matter.

**6.2** Respondents are requested to provide minimum replies to all questions asked in order to facilitate and allow for the most detailed examination possible.

## **7. INFORMATION ON BUS USAGE AND WEATHER CONDITIONS**

In order to help suppliers understand the STL's objectives, it is important for them to clearly comprehend the operations as well as the environment in which the STL uses its fleet of buses and therefore take all this into account in their presentation.

## **7.1 Bus usage**

The STL serves the territory of the Laval region, including some narrow, residential streets, where the maximum speed is 30 - 60 km/hr). There are also some - 2 to 4 - lane boulevards, with a maximum speed of up to 60 km/hr. Some neighborhoods have speed bumps in a number of locations. Some bus and mini-bus routes require travel on a highway access ramp, where the minimum speed is 60 km/hr. The roads on Laval's territory are subject to freezing temperatures and thaws in the spring as well as to icy or snow-covered roads in winter.

As far as bus use is concerned, 50-75% of the STL's bus fleet travels more than 250 km per day, in order to serve the various routes. For shorter distances, 7-15% of the STL's fleet travels 150 km per day or less.

## **7.2 Weather conditions**

The annual temperature variations in the Laval region range from -35 to +35 degrees Celsius. The winters are cold and dry, while the summers are hot and humid (with relative humidity of 25-100%). During the winter, from December to March, there is an average snow accumulation of 2.15 meters (6-7 feet). The snow tends to stay on the ground here for long periods of time. The harsh weather conditions have a very negative impact on bus maintenance and also have a significant impact on the design requirements of the vehicles. Snow accumulation on the bus exterior and the presence of snow inside the vehicle increase the risks of corrosion of its structure. When a bus is not in operation, it is parked inside a building. On a regular basis, it is subject to heat and cold shocks (hot-cold and cold-hot), depending on the season.

During the winter, de-icing materials (consisting of a gravel-salt-sand mixture) need to be spread on the streets and sidewalks for road maintenance purposes, in the interest of residents' safety. This abrasive mixture, which winds up on the structure of the buses, increases the risks of corrosion.

When transit users get on and off the bus, the gravel accumulated inside the vehicle may obstruct the water runoff drains, thereby preventing efficient runoff and also affecting the corrosion of the vehicle.

It is absolutely essential that the supplier become well aware of the weather conditions in Québec, in order to propose a vehicle that will meet the STL's needs.

## **8. BUS CLEANING (INTERIOR AND EXTERIOR)**

The outside of the bus is cleaned by means of an automatic washer. The proposed bus model(s) will therefore have to be able to withstand frequent washes, with and without contact.

The bus interior is hosed down with water, to clean it. All contact points, and in particular, those for ventilation, must be sealed in order to avoid any breakdowns. The supplier must submit the conditions for interior and exterior bus maintenance.

## **9. SUBMISSION INSTRUCTIONS**

**9.1** Suppliers interested in responding to this call for interest are invited to submit a structured document covering the aspects listed in Appendix 1.

## **10. RESPONSE CRITERIA**

The STL would like to know more about electric buses that meet the criteria that it has defined. Suppliers interested in responding to this call for interest are invited to fill out all the tables in Appendix 1. Any additional information will be accepted. In such case, the suppliers must make reference to such additional information in their response.

## **10.1 Response criteria**

**10.1.1** Suppliers must respond directly on the response tables in the section "**RESPONSE CRITERIA CONCERNING THE SLOW-CHARGE ELECTRIC BUS PILOT PROJECT**", in addition to submitting two (2) copies of their documentation and all other available information required.

**10.1.2** In the case where suppliers are unable to exactly respond to an essential response criteria, they may explain their offer, in the "Details" section. The STL will then examine the proposal accordingly.

**10.2** On the basis of the tables in this call for interest, this non-exhaustive list might be required at the time of a subsequent call for tenders. However, it will be more detailed and may be adapted to the reality of the market supply at that time, while allowing for greater market openness potential.

## APPENDIX I

### RESPONSE TABLES – RESPONSE CRITERIA CONCERNING THE SLOW-CHARGE ELECTRIC BUS PILOT PROJECT

#### GENERAL INFORMATION ON THE MANUFACTURER

Criteria	Information
Company name:	
Bus model:	
Location: city, country	
Contact:	
Telephone no.:	
Website:	

#### GENERAL INFORMATION ON THE PRODUCT

Specifications and requirements		YES/NO	Explanations
Technology	Under development		
	In production		

**GENERAL INFORMATION ON THE TYPE OF AGREEMENT**

Specifications and requirements		YES/NO	Explanations
Slow-charge electric bus: Possibilities considered :	Sale		
	Rental		
	Partnerships		
	Other		

**GENERAL INFORMATION ON THE REQUIREMENTS OF THE SLOW-CHARGE ELECTRIC BUS**

Slow-charge electric bus		
Specifications and requirements	YES/NO	Details
Endurance (operating range) (minimum distance covered per charge) with air conditioning or heating – <b>150 km or more</b>		
Recharging time for batteries - <b>4 hours or less</b> (for complete slow recharge)		
Speed – <b>minimum 60 km/hr</b>		
Length - <b>40 feet (12 meters)</b>		
<b>Low-floor bus</b>		

## **GENERAL FEATURES OF THE SLOW-CHARGE ELECTRIC BUS**

### **DIMENSIONS**

Criteria	Details
Length (mm)	
Width (mm) without mirrors	
Width (mm) with mirrors	
Front track width (mm)	
Height (mm)	
Wheel base (mm)	
Front overhang (mm)	
Rear overhang (mm)	
Approach angle (degrees)	
Departure angle (degrees)	
Floor height (mm)	
Height under vehicle (mm)	
Turning radius (mm)	

### **WEIGHT**

Criteria	Details
Curb weight – no load (kg)	
Maximum gross weight, including riders (kg)	
Front axle weight (kg)	
Rear axle weight (kg)	
Load capacity (gross weight – curb weight)	

### **BUS BODY AND STRUCTURE**

Criteria	Details
Bus body	
Structure (chassis and frame)	

### **CORROSION PROTECTION**

Criteria	Details
Corrosion protection	

## INTERIOR AND EXTERIOR FINISH

Criteria	Details
Interior finish (materials used, etc.)	
Exterior finish (type of paint, etc.)	

## POWER TRAIN COMPONENTS

Criteria	Details
Description of traction motor	
Drive axle	
Power and torque (nominal and maximum)	
Traction control	
Traction converter	
Energy consumption (with or without air conditioning and heating)	

## VEHICLE SYSTEMS

Criteria	Details
Power steering	
Suspension system	
Tires and wheels	
Brake system	

## DIAGNOSTIC SYSTEMS AND SAFETY FEATURES

Criteria	YES/NO	Details
Diagnostic system		
Safety features		

## BUS CAPACITY

Criteria	Details
Seating capacity	
Standee capacity	
Number of doors	
Access to people with reduced mobility, if applicable	

## POWER SYSTEM (BATTERIES AND/OR ULTRACAPACITORS)

Criteria	Details
Features (type, dimensions, weight, voltage, amperage, control, working temperature, life cycle in years, cost, etc.)	

## REGENERATIVE BRAKING

Criteria	YES/NO	Details
Regenerative braking (General features)		

## OTHER TECHNICAL SPECIFICATIONS

Criteria	Details
Acceleration	
Deceleration	
Slope	
Sound level	
Recharging time	
Heating system (electrical and mechanical) features:	
Air conditioning system (electrical and mechanical) features:	
Estimated and planned life cycle of bus	
Vibration level measurement (in an urban environment, if possible)	

## REQUIRED ELECTRICAL INFRASTRUCTURES

Criteria	Details
Required electrical infrastructures for slow-recharge (type, dimensions, weight, electrical and mechanical features, safety requirements, cost, etc.)	

## INTERACTIONS WITH LAVAL'S WEATHER CONDITIONS

Criteria	YES/NO	Details
Bus operating temperature: -35 to +35° C		

**GENERAL INFORMATION ON ELECTRIC BUS COSTS AND ORDER PLACEMENT**

Criteria	Details
Acquisition costs	
Delivery time after purchase order is issued (months)	
Certification for use in North America, if applicable	

**GENERAL INFORMATION ON MANUFACTURER'S EXPERIENCE**

Criteria	Details
Number of years of experience in manufacturing vehicles (all vehicle types)  For example: diesel bus, trolleybus, etc.	
Number of units produced annually (all vehicle types)	
List of present clients that are operating this type of vehicle or any other type of vehicle, if applicable	
Future developments (if possible)	