Executive Summary

Montreal's Agence métropolitaine de transport (AMT) and its partners are proud to introduce: **BRANCHÉ: Mobility reinvented** a proposal for Transport Canada’s Urban Transportation Showcase project (UTSP). The project consists of offering a self-service electric vehicle fleet of 100 cars, 10 low-speed vehicles and 50 bicycles in Montreal and Saint-Jérôme. In Montreal, the vehicles are made available through Communauto, an already well-established car-sharing firm with more than 4500 regular users.

Car-sharing is a logical complement to the various existing transportation modes and provides “Integrated mobility” to its users without the purchase of a car. The main advantage of car-sharing is how it complements public transit by broadening the range of transport options. Transportation possibilities are not reduced to the dilemma of choosing between private car and public transport, but include other modes of individual travel, which respond to increasingly varied mobility needs. This new mobility offered by vehicles in a self-service context is the bridge spanning what many specialists have recognised as a gap within public transport, which is the possibility for clients to access a car at any given time. Various studies in Europe and Quebec have demonstrated that car-sharing users reduce their auto use and increase their public transportation usage.

**BRANCHÉ** encompasses additional measures such as experimentation with annual public transit passes combined with car-sharing, as well as using telematics as a liaison, control and management tool. The use of biometry (scanning of fingerprints and the retina) is also envisaged, which demonstrates that **BRANCHÉ** proposes a truly integrated strategy in accordance with the objectives of the UTSP.

To ensure successful implementation of the project, AMT has teamed up with 12 prestigious partners, from both the public and private sectors, all recognised for their expertise in their respective fields. These partners will work in conjunction with AMT and the UTSP’s follow-up committee to ensure the success of **BRANCHÉ**.

The service will be established in Montreal's downtown area and its immediate surroundings as well as in Saint Jerome, a 60,000-people city located 50-km north of Montreal. In the latter site, we are looking at the natural evolution of a more modest research project already underway. The variety of sites of experimentation is in keeping with the objectives of the UTSP, allowing us to test the relevance and feasibility of the service offered in diverse urban settings. It will allow us to validate a possible large-scale deployment across Canada regardless of the size of the setting.

**BRANCHÉ** will enable the validation of three concepts in Canada:

- The establishment of a new mobility proposal designed as a complementary service to public transport.
- The use in an urban context of electrically powered vehicles.
- The use of advanced technology in the car fleet management.

The total budget for the project is $8.7 million. The balanced budget relies on a federal government contribution of 42.6%, 28.1% coming from the UTSP and 14.5% from other federal government programs. It is completed by a Quebec government grant of 32.8% to which is added 9.8% from partners and 14.8% from independent revenues.
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1. **Overview of the showcase project**

1.1 **BRANCHÉ**

Montreal’s Agence métropolitaine de transport (AMT) and its partners are proud to introduce: **BRANCHÉ: Mobility reinvented!** a proposal for Transport Canada’s Urban Transportation Showcase project (UTSP). The project consists of offering a self-service electric vehicle fleet of 100 cars, 10 low-speed vehicles and 50 bicycles in downtown Montreal and in Saint-Jérôme, a 60,000 inhabitant city located 50 km north of Montreal. (See map on next page)

1.2 **MOBILITY REINVENTED**

In Montreal, the vehicles will be made available through Communauto, an established car-sharing firm with more than 4500 regular users. Much more than a public service, car-sharing is seen as a logical complement to the existing transportation modes. One often hears of “Integrated Mobility” or “Combined Mobility” in Europe, which designates the availability of vehicles in a self-service context.

Starting from the premise that no mode of public transportation, considered separately, can effectively compete with the private car, car-sharing aims to include the car in the chain of public transportation. The objective is to create links between the existing services in order to augment their competitive advantage over the purchasing of a car.

More concretely:

- So-called "conventional" transit services meet the basic travel needs of their users;
- The local subscriber to a car-sharing service completes his mobility options by accessing an automobile on demand;
- An integrated fare formula is offered to the user, to further underline the advantageous appeal of this offer;
- A common information structure is established in order to adequately inform the public on all the transport options available to the user.

The immediate impacts of this combination for transit providers are:

- Improvement of the mobility supply by better responding to all the users’ needs;
- Increase of client base and greater loyalty;
- Enhanced corporate image due to the capacity for innovation;
- Contribution to the reduction of pollutants and greenhouse gas emissions.
1.3 PROJECT MANAGEMENT STRUCTURE

The following organigramme illustrates the management structure anticipated by AMT and its partners to ensure the success of the project to the satisfaction of Transport Canada.

![Organigramme](image.png)

To ensure successful implementation of the project, AMT has teamed up with 12 competent partners, recognised for their expertise in their respective fields. These partners will collaborate closely with AMT and UTSP’s follow-up committee to ensure the success of BRANCHE. The partners are:

- City of Montreal
- City of Saint-Jérôme
- Hydro-Québec
- Environment Canada
- Transport Canada
- Natural Resources Canada
- Centre for Electric Vehicle Experimentation in Québec (CEVEQ)
- Centre de géomatique du Québec (CGQ)
- Quebec Ministry of Transport
- Communauto Inc.
- Centre for Sustainable Transportation (CST)
- Downtown Montreal Transportation Centre – Smart Commuting

Chapter 6 presents the composition of the project team, while chapter 7 contains a detailed description of the roles and responsibilities of the partners.
1.4 ELEMENT CONTRIBUTING TO THE REDUCTION OF GREENHOUSE GASES

1.4.1 BRANCHÉ... a sustainable transport system

A sustainable transport system\(^1\) is a system that:

- Allows individuals and companies to satisfy their principal access needs in a safe manner, compatible with human health and ecosystems, and with fairness between generations;
- Is reasonably priced, works efficiently, offers a broad range of transport options and supports a dynamic economy;
- Limits emissions and waste in a way that does not exceed the planet's capacity to absorb them, minimises the consumption of non-renewable resources, limits the consumption of renewable resources by respecting the principles of sustainable development;
- Reuses and recycles its component parts and minimises land use and noise.

In this context there is no doubt that the BRANCHÉ is a real project for sustainable transport.

1.4.2 Anticipated Project Results

Reductions in GHG may derive from modal changes in the user or directly from the vehicle used. Considering the vehicle itself, we can expect a reduction of around 500 tons of CO\(_2\) for the anticipated pool of 100 electrically powered vehicles for the duration of the project.

In addition to CO\(_2\) reduction, plenty of other important benefits are associated with reducing motor vehicles usage. Indeed, as electrical vehicles are considered in the "Zero emissions" category, the project will entail a reduction for every electric vehicle of more than 13 kg of VOC, of 10 kg of NO\(_x\), of 0.3 kg of SO\(_2\), and 0.3 kg of PM\(_{2.5}\) particles, all of the components of urban smog, in addition to reducing CO by 150 kg (Data from Environment Canada for vehicles and small trucks, based on 10,000 km annual distance per vehicle).

When these reductions are paired with a modal change, the impact is even greater. Thus, car-sharing brings about the following positive contributions:

- Significant reduction, in the order of 50%, in the use of motorized vehicles;
- 50% reduction in the number of passenger-kilometres traveled in a car;
- Reduction in energy consumption;
- Reduction in greenhouse gas emissions;
- Proportional reduction in other pollutants attributable to cars.

These reductions are in addition to the ones generated by the use of electric vehicles in the project. Thus, BRANCHÉ falls within the perspective of sustainable development as much at an environmental and social level as at an economic level.

1.5 LINKS WITH LOCAL PLANS

A number of transport and urban planning exercises are currently underway in Greater Montreal. To underline the relevance of the project, the sections below will outline the links with the four main local plans that will have the most dramatic impact on the development of the region in the next 10 years.

\(^1\) Centre for sustainable transport, [www.cstctd.org/CSTnotremission.htm](http://www.cstctd.org/CSTnotremission.htm), Performance indicators for sustainable transport
1.5.1 AMT’s 2002-2012 Strategic Plan for Public Transport in Greater Montreal

AMT’s new 2002-2012 Strategic Plan is the first transport-planning document to include a pilot project of "self-service" electric vehicles.

AMT’s role is to plan, integrate and co-ordinate public transit interventions in Greater Montreal. Through its mission, it makes possible and facilitates innovative approaches. As such, AMT is the organisation responsible for the planning of alternatives to conventional car transport for the region. As the authority organising regional transport, the agency operates commuter trains, bus lanes, park and ride facilities and bus terminals.

AMT’s double mandate of planning and operation ideally positions it to identify the weaknesses of the currently available alternatives to conventional car travel. One of the weaknesses concerns short journeys without predetermined routes, such as, for example, a journey from home to a suburban train station, between a metro station and any final destination, or even between, say, two work places - to attend a meeting for example. Because of problems at the beginning or at the end of a chain of travel, certain clienteles have no choice but to opt for the use of a conventional private car.

One of the answers to this problem could well be the self-service vehicle (SSV). With it, AMT and its partners would be in a position to offer an alternative to the private car that is at once global, complete and adaptable to each particular situation.

The framework of the Strategic plan ensures that the self-service electric vehicles experiment will have positive spin-offs.

1.5.2 2001-2021 Land Use Master Plan for Greater Montreal

The 2001-2021 Land Use Master Plan for Greater Montreal adopted by the Quebec government in 2001 constitutes one of the most innovative land use development policy in North America. With the Plan, "the government strongly puts forward an organisation of space favouring the optimal use of public transport infrastructure with the objective of sustainable development and environmental preservation" even proposing to "develop the territory by considering the public transport infrastructure as the backbone of future land development in the region". Much is at stake in this ambitious statement as 90% of new homes are now being built in the suburbs.

As public transport infrastructure is concentrated in the older and central areas of the agglomeration, the Plan aims to concentrate future development in these areas of the city, which presupposes their successful promotion as residential commercial, work and leisure spaces. According to the Plan, "the single most important factor affecting tranquility and security is automobile traffic".

How to decrease the typically intense traffic in these central, older neighbourhoods, a phenomenon which already nourishes negative perceptions of these places in the majority of people, while the concentration of future development there would inevitably cause a traffic increase? This contradiction has not been resolved by the Plan.

The self-service electric vehicle could well constitute the missing link in the Plan because not only it would reduce total auto volumes in the central area, but also would minimize the noise and air pollution impacts associated with traditional thermal cars. Therefore, a widespread use of electric self-service vehicle could significantly improve the quality of life of central areas and facilitate a successful implementation of the urban strategies of the Land Use Master Plan.
1.5.3 Greater Montreal 2000-2010 Transportation Plan, from Quebec’s Ministry of Transport

This regional Transportation Plan, announced in 2000, is clearly intended to increase public transit use. Anticipating the Land Use Master Plan, which was released a year later, the Plan proposed "to consolidate and revitalize the city centre while increasing the quality of life for its inhabitants".

The regional Transportation Plan recognizes, however, that the increase in the use of transit "will not be possible unless it constitutes an effective, attractive and accessible alternative". Consequently, the Plan announced investments totalling over 2 billion dollars for transit infrastructure, including subway and commuter trains.

Just like AMT’s Strategic Plan and the Land Use Master plan, the self-service vehicle, by promoting variable and short-distance mobility, could become the missing piece of the Quebec Transport Ministry Travel Management Plan - both from the perspective of a global, complete and adaptable mobility supply, and from the perspective of an achievable quality of life in the centre of Montreal.

1.5.4 Canada and Quebec Climate Change Action Plans 2000-2002 and 2001-2003

These Canadian and Quebec climate change action plans foresee a number of transport measures, including major investments in transit infrastructure, but also support car-sharing and the study of the establishment of a fees for the acquisition of new vehicles, aiming to reduce fuel consumption.

The latter intervention hopes to lower the average fuel consumption of new cars purchased by Quebeckers. The former hopes to inspire them to give up privately owned cars, to instead "share" a reduced number of vehicles. It should be stated that one of the most important car-sharing services in North America (Communauto) is located in Montreal. Two years ago Communauto decided to replace its fleet with a single model, the Toyota Echo for its lower fuel consumption (the only other model available at Communauto is the Toyota Tercel). Sharing vehicles and the priority given to low fuel consumption vehicles therefore go hand in hand, the two offering additional value in a mobility offer which is complementary to conventional public transport.

Montreal's citizens and public officials are therefore already receptive to the idea of urban mobility not too removed from the self-service electric vehicle. The management capabilities developed in Montreal for these new forms of mobility will be fully deployed in the context of the Self-Service Electric Vehicles Showcase Project, of which Communauto is a partner.

Finally, this strategy is also embedded in the Canada Climate Change Action Plan that has identified the transport sector as the largest emitter of greenhouse gases in Canada (27% of emissions).
1.6 PLANNED PUBLIC INFORMATION STRATEGIES

By sharing electric cars, people will be offered a viable alternative to private car ownership and to its solo use. This innovative strategy judiciously bridges the gap in the area of public transport travel in Montreal. Given the avant-garde quality and regional scope of the BRANCHÉ project, it poses a major challenge in terms of information and promotion and will require a truly exemplary communications campaign involving all of its partners.

Communications objectives

The communications objectives are two-fold:

- To inform the public about the establishment of the BRANCHÉ project and the anticipated benefits for the individual, society and the environment;
- To raise awareness and convince citizens, more specifically the actual users of the transit system, of the importance of this alternative to the private car.

Target clientele

Although the 3.4 million people in Greater Montreal are potential clients, the targeted public is composed of:

- Current users of the Communauto service;
- Current transit users and, particularly students, young professionals, business people and tourists.

The campaign is also directed at local and national media, journalists and columnists covering transport and traffic and other specialized media outlets. In the long run, tourists will be targeted by the campaign to inform them of the benefits of this mode of transport which will include a tourist guide combining GPS, telecommunications and digital mapping technologies.

Campaign Signature

The signature of the campaign reflects the three dominant qualities of the project: the ecological, the practical and the aesthetic. Additionally, it has a young and dynamic quality, to better harmonize with the targeted public. A nod to innovation and modernity, the word BRANCHÉ stresses the idea that it is the complementary link in the chain of transit options offering intermodality. It also references electricity, an energy symbolized by an undulating line, a pulsing, vibrant movement, evoking freedom and lack of constraint.

Strategy

For the implementation in the spring of 2004, the communications strategy relies on three tools:

1. **Infrastructures**: posters on vehicles and charge ports;
2. **Press relations**: a press conference, follow-up with all media and the use of vehicles by well-known personalities.
3. **Publicity**: full-page print ads (major daily newspapers and weeklies), personal mailings, Internet and promotion.
1.7 ANTICIPATED LESSONS

Problems related to automobile use in the city have been an issue for more than 20 years, despite massive investments in roads infrastructure. These investments have not been enough to reduce the increased distances traveled daily; they have actually contributed to them. In addition, the external costs generated (hours lost in congestion, sound and environmental pollution) are considerable.

There are multiple solutions. We can, for example, develop public transport, use existing road infrastructures more intelligently, and adapt cars for the city. We can also technically improve transportation (due specifically to the massive contribution of electronics and automation) or indeed encourage new services such as self-service vehicles.

For a certain type of category of user living in under-served zones, or wishing to travel outside of peak times, the transit system is unsuitable. In this context, the self-service car appears as a new means of transportation complementary to public transport and taxis. We allow the car to be imagined differently. It is therefore integrated without questioning its guiding principle (freedom of movement) but in re-imagining the modalities of its usage.

Similar self-service electric vehicles providers already exist, or have, in many European and American cities. All of these projects are described in the annex "Showcase Programs: Self-Service Electric Vehicles, Analysis of 10 Cities" set up by the CEVEC, which also include lessons drawn from these experiences to be taken into account for the project. The main themes are the following.

Summary of principal projects worldwide

The Praxitèle project consisted of making self-service electric cars available around the clock to the citizens of Saint-Quentin-en-Yvelines, west of Paris. The experiment relied on a pool of 50 electric cars and three designated parking areas in special sites. The Praxitèle project was terminated essentially due to a lack of public funding.

Another French project, LISELEC, has been part of the general transit policy adopted by the urban area of La Rochelle for some years now. The exercise began in September 1999 with 50 electric vehicles distributed throughout seven strategically situated lots. The movements of the LISELEC fleet are detected and the control centre is informed, in real time, of the remaining vehicles. In September 2002, there were 464 users.

Based on the shared use of 50 electric micro vehicles, Toyota’s Crayon project has been in operation in Japan since 1999. More than 600 participants shared the project’s vehicles. The system works through the reservation of a car by computer. All of the information on the vehicle is sent to a control centre via the VICS (Vehicle Information and Communication System).

Based on the principle of car rental, the Massachusetts Electric Vehicle Demonstration Project was considered the largest North American program devoted to the evaluation of daily use of electric cars. The project is now terminated and its objectives were reached.

The New York Power Authority Electric Station Car Demonstration aims to improve environmental conditions and to facilitate travel within the city for transit users. The project uses 100 THINK City electric cars.
vehicles. The cars are recharged for free in eight stations. NYPA also provides recharging service at home for users.

Launched in 2002, the **Zero Emission Vehicle-Network Enabled Transport (ZEV-NET Program)** program was established in Irvine, California (156,000 inhabitants). The program combines a variety of GHG-reducing technologies: electric vehicles powered by various sources (solar energy, fuel cells, hybrids) available in a self-service context.

Currently underway in Long Beach and San Francisco, the **City Wheels (Clean Mobility Center)** program offers a variety of products (bicycles, scooters and VEs) for short distances in the city. This self-service program has more than 1000 users.

**Principal Elements Concerning the Different Programs**

The cars used are usually compact models whose dimensions are adapted to urban use. They are equipped with embedded technology, allowing for a variety of functions. All projects mentioned take place in the city or in the immediate suburbs - which constitute the zone of operation.

**Important Elements to Consider for BRANCHÉ**

Further to the evaluation of the ten projects and discussions with some of their representatives the CEVEC recommends the consideration of the following points:

- Establishment of a non-competitive complementary program to public transport;
- Integration of self-service electric vehicles in a global mobility supply;
- Gathering technological innovations necessary to the success of the project in a coherent system;
- Inclusion of the manufacturers in the program;
- Wider diffusion of the concept.

Furthermore, non-negligible benefits will be offered to BRANCHÉ’s clients. Other than the anticipated charge stations in various downtown locations and in the immediate surrounding area, the City of Montreal will also allocate designated parking areas for electric vehicles near busy destinations such as hospitals and universities.

The establishment of the project and the information gleaned from its realization will permit the validation of the concept in a much larger context, to the benefit of cities across Canada and of other organisations interested in urban mobility solutions and the fight against greenhouse gas emissions.
2. Detailed description of the project

2.1 DESCRIPTION OF STRATEGY

2.1.1 Integrated Strategy

The principal measure proposed by AMT and its partners, in the context of the UTSP, is the establishment of a new mobility proposal to satisfy transport requirements complementary to public transport. This new offer consists of the use, in an urban setting, of electrically powered vehicles, and hinges on the idea of sharing vehicles (car-sharing), a well-established concept in Quebec.

This new mobility offer encompasses other complementary measures such as experimenting with combining annual public transit passes to car-sharing, the use of telematics as a liaison, control and management tool (non contact smart cards, GPS systems), the use of biometry for access control is envisaged which demonstrates that BRANCHÉ presents a truly integrated strategy in accordance with the objectives of the UTSP.

2.1.2 Context

In Quebec, the transport sector is responsible for 38% of greenhouse gas emissions. This therefore makes it a strategic priority for the Canadian and Quebec climate change action plans. In 1994, automobile vehicles in the region produced 6.6 million tons of GHG. From now till 2026 emissions will increase to 8.9 million tons, a 35% increase. This progression is attributable to the sharp increase in the number of new cars (around 27,000 units annually) in the Montreal area and increase in car travel (around 3% more per year).

If nothing is done to curb the growing power of the car, the impacts on the environment will continue to multiply and get worse, in addition to the deterioration of travel conditions. In this respect, we have noticed that the limited congestion witnessed 10 or 15 years ago now seems generalized throughout the heart of the Montreal urban area. The quality of life for residents is heavily affected, as well as the competitiveness of Montreal companies. The abusive use of cars clamours for more urban space, especially in the downtown area, space that could be used to more productive or desirable ends.

Since 1996, public officials of the Montreal area have joined forces to boost public transport. To achieve this, a change in the image of public transport occurred by unleashing a massive marketing campaign and by developing targeted products (commuter trains, metropolitan bus lines improvements, park-and-ride lots, bus and carpool lanes, direct marketing, fare integration, bicycle-taxi, bicycle-bus, self-service bicycles, demand management (Allégo program) etc.). This strategy has been successful, as the decline in ridership observed in the 80's has been reversed.
However, this increase remains fragile. It urges the completion of the transport supply and the development of new and ever more seductive products. In this context, in an attempt to make transit more attractive and to comply to the Kyoto protocol, AMT and its partners wish to add a new element to the transport-cocktail, electric cars and electric bicycles based on the concept of self-service car-sharing. The use of electrical energy in the BRANCHÉ project will generate even more reductions in GHG, than self-service alone.

The greater Montreal region is home to a concentration of expertise in this field and is strategically positioned in the domain of electric vehicles and fuel alternatives with large scale showcase projects like the Electric Vehicle Project - Montreal 2000, the Evaluation of Electric Bicycles for Regulatory Policy project, the Pilot Project for Evaluation of Low-Speed Electric Vehicles or the BIOBUS (Biodiesel) project.

2.1.3 The BRANCHÉ Service

In the proposed project, the service will be established in Montreal's downtown area and its immediate surroundings, as well as in Saint-Jérôme, north of Montreal. In the latter site, we are looking at the natural evolution of a more modest research project already underway. The variety of sites of experimentation is in keeping with the objectives of the UTSP, allowing us to test the relevance and feasibility of such services offered in diverse urban settings. It will enable the validation of a possible large-scale deployment across Canada regardless of the size of the setting.

The service developed will differ according to the existing urban fabric. With the new mobility scheme, long journeys are undertaken by train or express buses, medium distances by metro and henceforth may be completed using a mobility link of extraordinary individual adaptability. To complement this, an annual pass combining public transport with self-service vehicle will be introduced.

A self-service vehicle provider has been in existence in Montreal since 1995. Communauto (inaugurated in Québec City in 1994) is one of the most important services of its kind in the world with over 4500 members sharing a fleet of over 250 vehicles. This customer base is increasing rapidly, to the order of 40 to 50% annually. The electric vehicles planned for the BRANCHÉ project will be added to the Communauto service, the project partner, further increasing the advantages of car-sharing and the benefits deriving from the alliance with public transport with a larger available pool of vehicles. Depending on the journey requirements, the client will be offered either an electric car or a thermal vehicle.
2.1.4 Mobility reinvented

The great advantage of car-sharing is how it complements public transport. It allows for a broader range of transport options within the perspective of combined mobility. Transportation possibilities are not reduced to the dilemma of choosing between private car or public transport, but include other modes of individual travel which respond to increasingly varied mobility needs.

Public transport also benefits from car-sharing which brings in new users. Indeed, the car sharer has the same travel needs as before, but spends less time driving. As rates for car-sharing are proportional to use, the user will inevitably opt for the most value for money solution. In the city that generally means public transport.

In June 1998 in Bremen, Germany, the combined public transport/car-sharing pass was introduced “Bremer Karte + AutoCard”. One year later, it was calculated that 26% of the combined pass holders used public transport more often than before. On average, the number of kilometres traveled on public transport went from 3,534 to 3,704 per person, 8.5% of new users abandoned their personal vehicles (by all accounts, a positive experience) and 26% joined car-sharing services instead of buying new cars as initially planned. 78% now hold annual membership as opposed to the 55% before the introduction of the combined card.

Car-sharing has a fundamental effect on mobility. While paradoxically making the car more available (by eliminating the prohibitive costs of car ownership), the opposite occurs. In fact, the underlying marketing principle is to sell the “advantages of the automobile” without the inconveniences of owning a car. The net result is a marked reduction in car usage. The modal shift brought about by car-sharing has been observed in Germany and is noted in the following table. Car-sharing has also, it should be noted, caused an increase in the use of taxis, which would otherwise appear to be an obvious competitor.

<table>
<thead>
<tr>
<th>Mode of Transport</th>
<th>Before registering for the service</th>
<th>After registering for the service</th>
</tr>
</thead>
<tbody>
<tr>
<td>Personal or borrowed car</td>
<td>60.5%</td>
<td>13.4%</td>
</tr>
<tr>
<td>Car-sharing</td>
<td>-</td>
<td>24.9%</td>
</tr>
<tr>
<td>Rented car</td>
<td>2.9%</td>
<td>3.1%</td>
</tr>
<tr>
<td>Taxi</td>
<td>0.8%</td>
<td>1.3%</td>
</tr>
<tr>
<td>Public transport</td>
<td>35.8%</td>
<td>57.3%</td>
</tr>
</tbody>
</table>

Table 1

Modal transfer engendered by car-sharing in % of annual mileage
(German data)


Thus car-sharing can be seen as a systematic approach to environmental protection.

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2.1.5 How BRANCHÉ works

The proposed service would consist of a pool of 100 electric vehicles available in self-service context in Montreal's downtown area, as well as 10 low speed vehicles, not exceeding the 40 km/h limit in accordance with current regulations. The low-speed vehicles will be available exclusively in Saint-Jerome. A pool of 50 electric bicycles will also be available in two strategically placed stations. Quebec was the first Canadian province to allow the use of electric bicycles on public roads, followed by British Columbia.

Parking areas will be equipped with recharging, surveillance systems, information terminals etc. The use of vehicles will call upon the latest developments in communications, of telematic transmission and management (GPS, digital radio, smart cards, automated procedures management software, etc.)

BRANCHÉ will enable the validation of three concepts in Canada:

1. The establishment of a new mobility proposal designed as a complementary service to public transport
2. The use in an urban context of electrically powered vehicles
3. The use of advanced technology in car fleet management.

These three concepts will rely on electric vehicles being integrated into a commercial pool of self-service vehicles. A synergy will be created with public transport with the introduction of combined mobility passes and the implementation of service stations in proximity to metro and train stations.

BRANCHÉ subscribers will also be able to use Communauto self-service vehicles and vice versa, thus enabling a more significant fleet of vehicles.

The use of electric vehicles will require membership of the service. In return for a minimal fee, the user will be given a contactless smart card. Other identification methods are envisaged: notably biometry (fingerprint and retinal readings). The outlines below illustrate the five steps to follow in order to be part of BRANCHÉ.

Thanks to these new technologies, the subscriber will be able to use one of the self-service electric vehicles at any time in return for a user fee based on the amount of time and the distance traveled. In addition, due to other embedded systems, clients will be able to request information or report a breakdown, and the control centre will easily be able to keep users informed. At the end of their journey, users will be asked to park the car at the original pick-up location and shut down the vehicle with their identification system. A monthly statement of account will be issued.
2.2 DETAILED DESCRIPTION OF PROPOSED MEASURES

As mentioned in chapter 2.1, the principal aim is the establishment of a new mobility supply complementing existing public transport, which makes use of electric vehicles, in a self-service context limited to a given geographic area.

2.2.1 Some Fundamental Notions

**Car-sharing**\(^4\): an advanced mobility scheme, which offers the flexibility of private car ownership while eliminating, for its subscribers, the necessity to actually own one, or indeed, in our North American context with high motorization of households, the necessity to own a second one. This offer distinguishes itself in many respects from conventional car rental: not unlike public transport, the vehicles offered in this manner are gathered in what can be described as "vehicle stations", where vehicles are available at any time of day or night without the need for an attendant.

We are fundamentally replacing, with this formula, a widespread consumer item, namely the car, with the sale of a service. The resulting billing rates have the effect of replacing fixed (high) car payments attributable to ownership, with lower variable costs.

**Self-service**: The term must be interpreted as publicly accessible, controlled and fee-paying. Access to the system is doubly controlled: it is guaranteed only to people who have signed contracts, and access is controlled by surveillance in real time: the manager knows at any given moment, who is using which vehicle, under what conditions, and where each vehicle is physically located.

**Reservation**: Vehicles can be reserved for an hour, a half-hour or even for the whole day. The possibility of reserving a vehicle in advance constitutes an obligation with respect to the direct competition of the individual car.

**Limited geographical sector**: Resorting to electric cars with limited autonomy implies geographical restrictions. Users pick up the car or bicycle at a given spot and return it to the same place at an agreed upon time.

---

1. Register by phone or online and select your option. You will receive your user guide by mail. Please note that a valid driver license is required.

2. Reserve by phone or online.

3. Pick-up the car at one of the 25 "branché" car depots.

4. Use the car and return it at the parking lot according to the agreed time.

5. Pay at the end of the month according to the number of hours used and the kilometers travelled.

5 steps to be branché!
1. Register
   by phone or on-line and pay your annual fees.

2. Reserve
   by phone or on-line or go directly to one of two bike depots.

3. Pick-up
   the bike at the nearest branché bike depot.

4. Use
   the bike and return it at the agreed time.

5. Enjoy yourself
   exception of the annual fees, it is totally free!

5 steps to be branché!
2.2.2 **System Components**

The project will make use of a pool of vehicles and bicycles that will be picked up and returned after use at fixed points, or stations, which will also act as energy charge ports. A control centre will ensure real time management, while the vehicle supplier will be in charge of maintenance. The system will determine user fee billing by calculating the duration of usage and the mileage covered. The administration of the system will necessitate the localization of the vehicles in real time, the verification of their condition (diagnostic, battery recharge), and their availability (free/occupied/reserved). Embedded positioning and diagnostic devices, as well as communications capabilities with the control centre will be integrated. The commercial aspect of the operation: client relations, welcoming of new clients, etc., will be carried out through a booking office at Communauto.

**VEHICLES**

The planned vehicles will have a specific look which will be immediately identifiable to Montrealers and users alike. The look is a crucial publicity opportunity for the project and will be a constant reminder of the project when the vehicle is either in use or stationary.

The electric vehicle provides undeniable environmental and energy advantages. Additionally the all-electric vehicle does not make any noise. The use of electric vehicles could also open up the market for electric vehicles and inspire users to eventually obtain this type of vehicle for themselves or become familiar with non-polluting vehicles.

**STATIONS/ CONTRACTED TERRITORY**

**Location of stations (designated parking areas):**

The **BRANCHÉ** project vehicles will principally be located in downtown Montreal, but a dozen of them, 10 low-speed vehicles and two or three conventional electric vehicles will be located in the centre of Saint-Jérôme, very probably at the following stations:

- Place de la gare (future intermodal train/bus station, expected for December 2003);
- Carrefour du Nord regional mall;
- Saint-Jérôme Court Hall.

For the downtown Montreal area, more than 20 stations are planned for vehicles and four kiosks for bicycles. In addition to this, all existing Communauto parking areas will allow access to self-service vehicles.

The first map shows the preliminary locations of the downtown stations, Communauto parking areas, as well as the principal travel generators served, and main public transport available nearby. The second map presented below indicates the Communauto service zones in Montreal.
Communauto Stations Location

Legend:

Communauto Stations Location, May 2003
The stations constitute one of the critical elements in the system, as their number and strategic placement will determine system’s accessibility. The choice of locations for the BRANCHE stations will be essentially guided by the following criteria: proximity to large travel generators and to main transit hubs downtown (metro stations, train stations, bus terminals) as well as the visibility and accessibility of a chosen site. The importance of visibility and accessibility explains the choice not to locate stations in interior parking lots.

Station Planning and Equipment

Stations will be laid out in a distinctive way. Certain light structural and display or signing elements, the demarcation of stations with banners, will be predominant to easily identify the sites. As planning site locations requires a detailed understanding of the area covered by the system and the structure of related travel, we anticipate the possibilities of corrections and readjustments while the newly implanted system is in its infancy. The use of certain design elements in the development will make potential relocations easier.

Stations will be equipped with all the equipment necessary to ensure the smooth running of the self-serve vehicle service. They will principally be equipped with electric charge ports and will also provide a link between the system, the control centre and the user by means of screens displaying information and system developments. Vehicle movements will be tracked from start to finish and the control centre will be kept informed in real time. Finally, special attention will also be given to protecting the stations against vandalism by the use of surveillance cameras and attendants at the bicycle kiosks.

CONTROL CENTRE AND MAINTENANCE

The control centre will house the team and the computerized monitoring system. The control centre will provide both the client interface and surveillance and regulation of all vehicles including all corrective courses of action taken in case of breakdown or other accidents concerning an isolated vehicle. BRANCHE’s control centre will be integrated into Communauto’s.

The verification of a vehicle’s status is necessary to determine its logical availability (non-occupied vehicle free of all reservations) as well as its technical availability (primary mechanical functions, battery charge, etc.). A variety of management software will enable the visualization of data transmitted from the vehicle pool. All information will also be available in real time on the Internet.

SUBSCRIPTION TO THE SERVICE AND RATES

Subscription to Service

Anyone interested in participating in the BRANCHE program will have to become a member of Communauto. Special conditions will apply to annual transit pass holders and other conditions will apply to non-holders of these passes.

Annual pass holders can, in exchange for a fixed monthly fee, get access to all showcase program vehicles as well as Communauto vehicles. Thus public transport will ensure the primary service, and a car-sharing membership will guarantee mobility in instances where public transport is not able to offer the desired services.
The cars in the Showcase program as well as Communauto’s vehicles are also accessible to non-annual transport pass holders, but it will mean a higher monthly fee. It is also necessary to consider a fixed monthly fee payable to Communauto to ensure the sustainability of the service after the showcase project. This strategy will also avoid the risk of a transfer of Communauto’s members (who have had to pay, in a non-subsidized context, a $500 reimbursable "membership fee") to the BRANCHÉ service, which could weaken the organisation. (To learn more about Communauto’s current rates please visit: http://www.communauto.com)

Being a member of Communauto will give access to the showcase program vehicles for short-distance travel by electric car. The central reservations office will determine the allocation of cars according to destination. Finally, all members will also have access to the pool of electric bicycles.

The promotion of the service will be ensured by poster campaigns at bus stops and metro stations, by stickers in public transport vehicles, by brochures and press campaigns. Information plays an important role in the development of the offer, for details please see chapter 2.4.

**Rates**

For members of the service, the rate is determined by a fee per kilometre, which is added to a fee for the length of use, by the half-hour, the hour, or the day. This is essentially a fee based on usage.

A number of formulas will be proposed, according to the type of membership of the user. A difference in rates according to type of vehicle, electric or conventional, is also to be expected (To learn more about Communauto’s current rates please visit: http://www.communauto.com)

<table>
<thead>
<tr>
<th></th>
<th>Communauto members</th>
<th>Annual subscribers to the TC (employers) or postal TRAM who register for Communauto via BRANCHÉ</th>
<th>Annual non-subscribers to neither TC nor Communauto but who register for Communauto via BRANCHÉ</th>
</tr>
</thead>
<tbody>
<tr>
<td>Registration fee</td>
<td>Free</td>
<td>$10 a month (to be validated) payable to Communauto</td>
<td>$15 a month (to be validated) payable to Communauto</td>
</tr>
<tr>
<td>Communauto fleet</td>
<td></td>
<td>Cost per km and per duration of use according to current rates (A, B, C)</td>
<td>Cost per km and per duration of use according to a rate to be determined</td>
</tr>
<tr>
<td>Conventional vehicle</td>
<td></td>
<td>Cost per km and per duration of use according to a rate to be determined</td>
<td>Cost per km and per duration of use according to a rate to be determined</td>
</tr>
<tr>
<td>BRANCHÉ fleet</td>
<td></td>
<td>Cost per km and per duration of use according to a rate to be determined</td>
<td>Cost per km and per duration of use according to a rate to be determined</td>
</tr>
</tbody>
</table>

**EMBEDDED SYSTEMS**

These are the systems that manage the vehicular fleet. Their aim, among other things, is to provide the tools of acquisition and transmission of data, in real or deferred time, from each vehicle to the control centre.

The systems listed below are embedded in all vehicles:

- **Contactless smart card** enabling a vehicle to be unlocked and accessed; or fingerprint or retinal scanner according to the identification method chosen during the establishment of the project;
- **User data gathering unit** to register the driver of the vehicle;
- **Data treatment unit**, as in diagnostic and regulatory devices for the functioning of vehicles;
- **GPS location unit** for locating vehicle position at all times and for a variety of other uses;
- **CD-ROM player, cellular phone, keyboard and screen**, which offer the user the possibility of transmitting information or consulting information sources, or receiving information.
Data sets gathered and transmitted via mobile telecommunications to the fleet’s integrated control centre are processed. This data can pertain to the management of various mechanical components of the vehicle (telemetry), to the positioning of the vehicle in real time, as well as data concerning emergency situations. For this, the control centre management operator can be informed in real time, on a computer screen, of all situations involving the vehicle. The operator is provided with a multitude of information gathered from the vehicle in a user-friendly way, in a similar environment and resembling an integrated management chart.

The data transmitted for each vehicle could vary in nature:

- **Vehicle positioning data**
  - Location in real time, at all times or on demand, according to a fixed time;
  - Duration and positioning of excessive speed;
  - Location and transmission of a distress signal in an emergency, an accident or a breakdown;
  - Detection of location and follow-up in cases of theft;
  - Record of utilisation (journeys, frequency, etc.);
  - Warning when utilisation perimeters are exceeded;
  - Location of place where the vehicle is recharged.

- **Mechanical telemetry data**
  - Duration and positioning for each occasion the engine is started up and switched off;
  - Duration and positioning for each occasion the fuel panel is opened;
  - Temperature of brakes and cooling system;
  - Temperature of engine;
  - Charge percentage and condition of battery;
  - Record of mileage when a vehicle is started up and turned off, or in real time;
  - Data that is of use when determining vehicle energy consumption, condition and wear.

- **General data**
  - Vehicle user;
  - Number of hours of utilisation;
  - Mileage completed;
  - Energy consumption;
  - Data for managing billing (number of kilometres covered, date/time at the start and finish of periods of utilisation);
  - Voice and text data in emergencies.

Each vehicle will be provided with a screen enabling users to visualize their geographical position and route in real time. The driver can thus situate himself according to various reference points, such as, for example, the address where the vehicle is situated, or depending on an intersection, landmarks nearby or coordinates. A geometric system and navigation tools integrated into the vehicle will provide the driver with voice, text or graphic instructions on how to get to a specific place as well as points of interest nearby (restaurants, cinemas, charge ports, reserved parking spaces, etc.)
CUSTOMER SERVICE

Customer service will be situated in the Communauto offices and will welcome new subscribers who will fill in a form and present the following items: copy of their driver’s licence, record of their automobile claims file, record of their driver’s abstract, two photos, and a check. A credit check will be performed.

Once the contract is completed, the customer will receive a contactless smart card and a user number. The customer will also be provided with documents concerning the use of the vehicle, its capacities, security procedures, etc.

Reservation

A simple phone call is all that is needed to reserve a vehicle 24 hours a day. The reservation can also be made on the Internet. Depending on the distance to be covered, a specific vehicle will be recommended. Information in real time on the state of the system will be available (location of free vehicles), via the Internet, allowing the potential customer to choose his departure parking space and reserve the vehicle short-term. Once the reservation is made, the customer can take possession of his vehicle at the designated parking space and bring it back to the same place at the set time.

Picking up a vehicle

A vehicle is picked up using a contactless smart card reader, enabling the vehicle to be unlocked and accessed. When the customer approaches the vehicle, he passes his card in front of the electronic reader and the doors unlock automatically. When the vehicle is returned, the doors are locked in the same way. Thus users can have access to the vehicles 24 hours a day.

Billing

There will be monthly billing for vehicle usage and fines for offences. The amount billed must be paid in full on reception of the bill. Fines are related to the breaking of any rules and regulations provided when the client registers in the system. For example, the utilisation of a vehicle without a reservation, or an error in picking up a vehicle, the late return of a vehicle or the return of a vehicle to the wrong parking space, the last minute cancellation of a vehicle, etc.

2.2.3 Sustainability of the project

The BRANCHE project foresees the establishment of a new offer of mobility that complements public transport, consisting of the use of electric vehicles in an urban setting, and working on the concept of self-service vehicles.

At the end of the showcase project, the service offered by Communauto will continue to exist in its current form. If proof of the synergy created by the offer of pass combining self-service vehicles and the annual public transport pass is demonstrated during the project in Montreal, partners will surely be induced to offer their support for the continuation of the showcase project.
2.3 ANTICIPATED IMPACTS

2.3.1 Nature of recorded environmental impacts of car-sharing

Car-sharing has precise and measurable advantages for society, which are increasingly well documented. Here is an overview.

GREENHOUSE GASES AND OTHER POLLUTANTS

The impacts of car-sharing on the reduction of greenhouse gas emissions is such that in Holland the Federal government estimates that this measure could alone lead to an annual reduction, from now until 2010, of 0.34 megatons of CO\textsubscript{2}, 12% of the target being identified as 2.9 megatons a year for the transport sector (Meijkamp, 2000). A European Commission study concluded that car-sharing could reduce the distance covered by car, in Europe, by 32 billion kilometres per year and CO\textsubscript{2} emissions by 5 million tons per year (Wilhite et Atrali, 2000). Other atmospheric pollutants attributable to cars (NO\textsubscript{x}, CO, volatile organic compounds etc.) would also be reduced proportionately.

50% REDUCTION IN AUTO OWNERSHIP RATES

Communauto car-sharing service reduces auto ownership rate by about 50% among its users (Robert, 2002). This means that 2000 supplementary vehicles would most likely be in use today on the roads in Quebec City, Montreal and Sherbrooke should the service not exist.

These results can be compared advantageously with data from similar studies carried out elsewhere in the world. Thus, according to Shaheen et al. (1998), this service leads, in Europe, about 30% of its subscribers to abandon a vehicle. In Quebec City, this proportion is estimated at around 29%, and 21% in Montreal. Furthermore, 56% of Quebec City users and 61% of those in Montreal say they have decided to subscribe to this service as opposed to buying a vehicle.

50% REDUCTION IN THE NUMBER OF PASSENGERS – KILOMETRES

These reductions are due to the changes to the habitual modes of travel before and after the use of car-sharing. Such measures have been carried out in four countries:

- Switzerland: 57% reduction (Muheim, 1998);
- Germany: 50% reduction (Baum and Pesh, 1994, in Wilhite and Attali, 2000);
- Austria: 47% reduction (Steininger et al, 1996);

REDUCTION IN ENERGY CONSUMPTION

Calculations made for Switzerland, taking 600,000 car-share users as a base (Switzerland currently has more than 50,000 users), show a total reduction of 790 million kilometres-car per year and a saving of 3,900 terajoules per year in energy used by vehicles (Muheim, 1998 in Wilhite and Attali, 2000). The potential number of car-share users in Switzerland is estimated at 1.7 million. Thus, according to the Federal Energy Agency, each group of 180,000 users would enable a 2% reduction in the country’s energy consumption for private transport (Lamure et al., 1999).

\[^{5}\text{Source : Communauto « L’auto-partage et le transport en commun – ensemble pour une mobilité durable », Paper presented to the Transport and Environment Commission, 18 February 2003.}\]
IMPACT ON TRAVEL BEHAVIOUR

Since users of a car-sharing service do not usually drive for commuting or day-to-day shopping, for example, we can induce a definite inclination towards “eco-mobility”, such as the use of public transportation, bicycles or walking. The resulting attitude is exactly the opposite of that adopted by the majority of car owners. In Switzerland, while clients of these services make three quarters of their journeys using an eco-mobile means of transport, the majority of the population will make use of a car, a motorcycle, or a moped, in the above proportions; eco-mobility only makes up the final quarter (Muheim et al., 1998).

Although Communauto does not have quantitative data of this nature on its users yet, numerous indicators allow us to believe that the impact of car-sharing is no less interesting here. In fact, less than 1% of Communauto members regularly use a car to commute whereas 98% of them use public transportation services (Robert 2002). The impact of the service risks being even more long-lasting since less than 28% of Quebec City users and less than 15% of Montreal users envisage purchasing a vehicle in the future (Robert 2000). Of the latter, a strong majority say that their household would have proceeded much faster towards the acquisition of a vehicle in the absence of the service offered by Communauto (67% in Quebec City and 81% in Montreal). As for the households that did not foresee purchasing a vehicle when the question was put to them, it is interesting to note that the majority of them said that their household would be more susceptible to making such an acquisition should their be no such service offered (66% in Quebec City and 68% in Montreal).

2.3.2 Anticipated results of project

As mentioned in the preceding sub-sections, the reductions in GHG can result from modal change by the users and/or directly from the vehicles used. If we deal with the vehicle alone, the data obtained by the Electric Vehicle Project – Montreal 2000 via the “System for Measurement And Reporting to TEAM (SMART)” shows that the annual reduction for the average commercial vehicle amounts to about 5.1 tons of CO₂ based on an annual journey distance of 10,000 km. Therefore, for the duration of the project, this represents a reduction in CO₂ of around 500 tons for a pool of 100 battery-powered electric vehicles.

When this reduction is paired with a modal change, the impact is even greater. In fact, taking into account the Communauto and AMT figures, we are able to project that more than 50% of clients of the self-serve electric vehicle service will opt for a modal change towards public transport. This in turn adds to the reduction engendered by the project’s vehicles.

Lastly, apart from the reductions in CO₂, the relative benefits associated with the reduction of motor vehicle emissions are equally significant. In fact, electric vehicles being considered as “zero emissions”, we can also maintain that the project would entail a reduction for each electric vehicle of more than 13 kg of VOC, 10 kg of NOₓ, 0.3 kg of SO₂ and 0.3 kg of particles (PM₂.₅), all components of urban smog, as well as a reduction of 150 kg of CO (Environment Canada data for light vehicles and trucks, based on an annual distance of 10,000 km/vehicle).

Thus the project comes within the scope of a sustainable development perspective at an environmental, social and economic level. In fact, the economic level merits a special mention because of the fact that the automobile industry no longer has a presence in Quebec since the closure of GM’s plant in Boisbriand. This implies that any investment in public transport directly benefits Quebec industry and local job creation.

2.4 PUBLIC INFORMATION STRATEGY

Problem

Like in other large Canadian cities, a large number of trips occur daily in Greater Montreal. Luckily the region is well served by a significant public transit network, which is well organised, intermodal, modern, and, each year, is strengthened by the addition of new services that reflect its constantly evolving needs. However, its citizens are still far too prone to choosing the car as mode of transport, driving alone to downtown Montreal each morning, which results in heavy congestion.

In fact, these congestion problems have a major impact on financial planning, since congestion alone is responsible for financial losses valued at 500 million dollars each year. The effect upon society and the environment is significant, in that quality of life depreciates as does air quality, consequently also affecting our health.

Context

Over the last decade the notion of public transport has undergone a complete transformation: it has gone well beyond the classic subway and bus services. Indeed, public transport now offers an alternative to owning a car and to using a private car for each situation, thanks to suburban trains, buses, the subway, carpooling, cycling, walking, or even vehicle-sharing. And the fusion of all these modes is not only encouraged but organised: from now on the watchword is intermodality. In offering everyone the right to choose from these means of transport, public transport becomes everybody’s business.

Electric vehicle-sharing is an efficient and innovative measure that is becoming increasingly popular and widespread in many large cities worldwide. With the BRANCHÉ project’s self-service electric vehicles, AMT would like to improve Communauto’s current offering, creating the missing link in Montreal travel, and completing the range of public transport solutions already available.

The BRANCHÉ project’s self-service electric vehicles represent a major challenge regarding information and promotion, given their avant-garde nature and their metropolitan scope. This is why an exemplary communications campaign, in collaboration with all partners involved, is essential to its success. In order to give this project maximum visibility, the communication plan relies upon an interesting mix of publicity-promotion and public relations aimed at the target clientele, current and potential public transport users, students, young trendy professionals, business people and tourists.
The objectives of the communication plan are to create awareness of the project within the population of Montreal, to demonstrate its potential to users and to show its effect upon the quality of life for citizens of a metropolis such as Montreal in order to influence the long-term behaviour of the population.

**Objectives**

The objects of the communications planned for this stage are the following:

> Provide information about a new service of self-service electric vehicles that is being set up in Montreal, emphasizing the benefits for both the individual and the community.
> Sensitize citizens, or more specifically current public transport users, to the importance of this project and encourage them to use an alternative means of transport to private car use with the aim of:
>  - Increasing use of public transport;
>  - Promoting growth of and loyalty in public transport clientele;
> Coordinate efforts with those of partners involved to solidify messages and actions with the aim of ensuring the provision of coherent information.

**Target clientele**

> The approximate 4,500 current users of the Communauto service;
> Current users of public transport;
> The general population;
> National and local media, journalist and columnists who cover transport issues, and specialized media.

**Market**

> People living and working on the Island of Montreal.

**Campaign signature**

The campaign signature reflects the three dominant qualities of the project: ecological, practical and aesthetic. The emphasis is on the young and dynamic, to appeal to the target public.

The word **BRANCHÉ** (connected) refers to electricity, the energy source used by electric cars and cycles; it also emphasizes the idea that the self-service vehicles are the complementary link in the range of public transport that offers intermodality; it is also a nod to innovation and modernity. The broken line symbolises the journey on public transport that now benefits from new connection points; it also brings to mind electric waves. The line, wavy and vibrant, gives the idea of freedom of movement, with no constraints.

**Strategy: three vital communication tools**

The communication strategy was developed with a view to offering the **BRANCHÉ** project optimal visibility in Greater Montreal with its target public. This strategy relies upon three main tools.
TOOL 1: INFRASTRUCTURES

The new fleet of vehicles and the infrastructure that it will require create an important communication potential. Indeed, the unusual vehicles will be a very strong asset to the visibility of this project due to their originality and novelty in the Montreal area. Without doubt, the vehicles will attract attention and will themselves become one of the best mediums that we will be able to develop to promote the project. The vehicles will thus act as the messengers, displaying the distinctive project logo as well as an easy-to-remember and highly visible Web address.

TOOL 2: PUBLIC RELATIONS

Evidently public relations will play a dominant role in the orchestration of actions and communications. In fact, this modern and innovative project presents a social and ecological aspect that is guaranteed to stimulate much attention from the press.

Firstly, an important press conference for the project launch will be held and many interviews will be given to the media to promote the project. This announcement will be presented at an event of some calibre, held at an original location and following an unusual scenario. Funding obtained for this project and its partners will also be presented. A complete fact file for the project will be developed and given to journalists and guests. This document will include a press release, technical specs for the project, maps of where the cars and bicycles will be situated as well as various visual tools relative to the project.

Along with the press releases and media coverage that a project of such significance naturally engenders, integration of editorial coverage will also be attempted by letting certain reporters and journalists try out the electric vehicles. Certain personalities from the art and business worlds will also be invited to try a vehicle for free for a few days. This strategy will encourage coverage in various media that would not usually cover transport.

Finally, various conferences will be held to explain the project at busy gatherings (Chamber of Commerce meetings, university conferences, transport conventions, etc.)

TOOL 3: PUBLICITY

Evidently traditional media forms will be used to promote the self-service electric vehicle project.

Print

Obviously the project launch will be supported from year one by large format (minimum 2/3 of a page) publicity in the large newspapers. This media enables the efficient spread of information, emphasizes the "newness" of the project and makes use of a powerful and unique icon, the electric car.

Direct mailing

Several databases of interest could be used for a direct mailing campaign that would present details of the project, a description of the new vehicles, their availability, how to register, etc. Here are a few examples of these mailings:
> 4,500 mailings to Communauto members;
> 2,000 mailings to transit (TRAM) card holders;
> 2,000 mailings to AMT-INFO subscribers;
> Several mailings via information leaflets sent to Hydro-Quebec customers.

Internet

The BRANCHÉ project will have its own distinctive micro-site on the Internet, containing comprehensive information on how the project works and the new vehicles in circulation. This micro-site will guide users who wish to register, to the program on the Communauto or AMT sites. Given the importance of creating product awareness as well as “brand” awareness, creating an image for the service that is trendy, original, accessible, practical, ecological and economical necessitates the project having its own Web address. The names and logos of collaborators, with hyperlinks, will be displayed on this page and users will also be offered an e-mail address for any comments and questions. This Web address will appear on all publicity and on all vehicles in circulation.

Conclusion

Communications must revolve around working on raising the social awareness, to turn each citizen into a responsible user of urban space, who re-appropriates public space and adopts new means of transport appropriate to sustainable development. The communication objectives in the starting up of this new electric vehicle project are to change behaviour, create a common interest in the use of alternative means of transport and institute a new city travel culture, for a sustainable development of urban Montreal.
2.5 PARTICIPATION IN THE NATIONAL INFORMATION NETWORK

Transport Canada already counts on the full collaboration of AMT and its partners to share with the rest of Canada the lessons that will be learned from the BRANCHÉ project.

This collaboration is already well established as is evident in the participation of AMT in the 2003 annual convention of the Canadian Urban Transit Association (CUTA), which will be held in Winnipeg in June. At the convention, AMT will present the BRANCHÉ project as part of a workshop lead by a representative of UTSP.

Transport Canada will be able to count on the full collaboration of the director of the AMT project for an explanation of the project, participation in conferences and project follow-up.
3. Evaluation of impacts and reports

3.1 AMT AND MEASURING INSTRUMENTS

AMT is equipped with a quality system based on numerous performance indicators. In all its projects, AMT develops follow-up mechanisms, which enable both progress and the relevance of actions to be measured. This project will be no exception. A daily follow-up of these indicators will be performed and the results will be transmitted via the AMT web site. Regular polls will also be conducted. AMT is in charge of the largest origin-destination survey to be conducted in North America in the public transport domain. Moreover, this expertise is recognised worldwide.

The indicators to be developed will concentrate on the number of kilometres covered, the GHG savings, the reduction in atmospheric pollutants, etc. At all times, Transport Canada will be able to inquire about the project’s progress and its spin-offs, notably concerning usage rates, patterns noticed, destinations, number of outings completed, average length of usage, the number of kilometres covered per outing, average speed, energy consumption, user profiles, etc. The preceding section provides information relevant to this subject.

As part of the self-service electric vehicle project, various studies will be conducted in order to evaluate the impacts. These studies are grouped into four main themes concerning:

1. GHG and other pollutants reduction (2 indicators);
2. Efficiency of EVs integrated into the project (3 indicators);
3. User behaviour and perception (around 10 indicators);
4. Profitability of the self-service EV project (4 indicators).

For each of these themes, a group of indicators will be studied in detail. Some principal indicators will be, amongst others, reduction of greenhouse gases and other pollutants, energy consumption of electric vehicles, diverse aspects linked to user behaviour and perception, the cost of EV use or the reduction of household spending.

These indicators are based on experiments carried out by CEVEQ and its partners during the environmental impact demonstration programs:

- Electric Vehicle Project – Montreal 2000;
- Pilot project: evaluation of low-speed vehicles in an urban setting;
- Project concerning the regulation of electric bicycles.

Indicators developed by the Centre for Sustainable Transportation will also be used.7

The intention is to produce step reports throughout the project for themes 2 and 3. Themes 1 and 4 will be integrated directly into the final report, which will be completed at the end of the project.

3.2 REDUCTION GHG AND OTHER POLLUTANTS

Greenhouse gases as well as the emissions of atmospheric pollutants such as carbon oxide (CO), sulphur dioxide (SO2), nitrous oxides (NOx) and volatile organic compounds (VOCs) are major irritants produced by

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7 Centre for sustainable transport, [www.cstc.tld.org/CSTnotremission.htm](http://www.cstc.tld.org/CSTnotremission.htm), Performance indicators for sustainable transport
terrestrial transport. Following the ratification of the Kyoto Protocol by the Government of Canada, it is crucial to attack the reduction of GHG and other atmospheric pollutants.

**Indicator: Greenhouse gas emissions**

A system of sustainable transportation "limits emissions and waste in such a way that they do not exceed the planet’s capacity to absorb them". A good indicator of progress towards sustainable transportation thus shows emissions coming from transportation (usually in the air). When a reduction in emissions is shown, it means progress towards the goal of sustainable transportation.

Transportation is a major source of GHG emission resulting from human activity in Canada, contributing approximately one third of total direct emissions and even more, if one takes into account the emissions resulting from the fuel production. Carbon dioxide (CO₂) is the most significant GHG to be produced by transportation, counting for 90% of transportation’s contribution to the greenhouse effect.

**BRANCHÉ** enables a GHG reduction, as it does not produce carbon dioxide. As mentioned in section 2.3.1, a summary of emissions will be compiled throughout the project along with a summary of behavioural changes that lead to a mode switch from a private vehicle to public transport. Questionnaires will be handed out to each user in order to ensure the anticipated modal transfers.

In order to best document the reductions in emissions, the modal transfer phase will be evaluated according to a selection of samples statistically representative of the various car-sharing service clientele.

A set of data exists regarding the quantity of greenhouse gas emissions produced by gas-powered vehicles according to mileage or even units of energy consumed. The results of the number of kilometres covered or the total quantity of energy used in the self-service EV project will enable the reduction of GHG to be quantified.

For example, a very preliminary evaluation that can be made is the use of 100 electric vehicles would correspond to the retirement of an equivalent number of fuel-powered vehicles and would eventually translate as an annual reduction of 500 tons of GHG (with an average of 10,000 km per year per vehicle).

To this, reductions in GHG due to the modal change of service users must be added. In fact, it is estimated that around 50% of users of this type of service change their travel habits, using public transport and the car-sharing service instead of their personal car. This in turn leads to a further reduction in GHG.

This data will be presented within the final report.

**Indicator: Other emissions resulting from transportation**

This indicator concerns the technical performance of road vehicles, and more specifically their emissions that have an effect on a local scale by unit of transport activity. It also provides the details on emissions resulting from all types of road vehicles that have an effect on a local scale.

This indicator provides information on the subject of certain emissions resulting from transportation and having an effect on a local scale, such as: carbon oxide (CO), sulphur dioxide (SO₂), nitrogen oxide (NOₓ) and volatile organic compounds (VOCs). The latter two pollutants are most worrying since, in the presence of sunlight, they combine to form surface ozone, or smog.

By using electricity or sources that emit less atmospheric pollutants as a means of propulsion, **BRANCHÉ** enables a notable improvement urban air quality. A mass balance of the principal contaminants regulated
(NO_{x}, CO, PM_{2.5} and total hydrocarbons) will be carried out for the various vehicles (using the Environment Canada data available) and for the modal transfers (via user polls).

Just like GHG, a set of data concerning the quality of carbon oxide (CO), sulphur dioxide (SO_{2}), nitrous oxide (NO_{x}) and volatile organic compounds (VOCs) produced by gas-powered vehicles according to mileage or unit of energy consumed already exists. The results of the number of kilometres covered or the total quantity of energy used in the self-service EV project will enable the reduction of GHG to be quantified.

Certain studies carried out in the United States or in Europe tend to demonstrate that the reduction in pollutant gases directly affects air quality and reduces health risks, leading to a substantial reduction in health related costs (reduction in mortality and morbidity rates).

This data will be presented within the final report.

### 3.3 EFFICIENCY OF VEHICLES INTEGRATED IN THE PROJECT

A certain number of technical summaries will be completed regularly (real time or daily) by data collection systems embedded in the vehicles. These systems will enable the production of results on the energy consumption of the EVs, the distances covered and the availability of the vehicles as well as the cost of using an EV.

From this data, it will be possible to measure the reliability, efficiency and the profitability of the electric vehicles in real conditions of self-service usage in an urban setting.

**Indicator: Energy consumption**

A system of sustainable transportation enables the “minimisation of the consumption of non-renewable resources”. Thus a good indicator of progress towards sustainable transportation is one that shows consumption of non-renewable resources by transportation. When consumption is reduced, progress towards the goal of sustainable transportation is noted.

This indicator relates to the technical performance of road vehicles, and more specifically the quantity of energy they consume. The indicator represents the total energy consumed by operations related to transportation. It represents the energy consumption by unit of distance, corresponding to the manner in which the use of fuel is reported in the metric system (i.e. litres per 100 km). This type of measure is known as “energy intensity”. By using no non-renewable resources such as fossil fuels, **BRANCHÉ** can only improve this indicator.

The data collection systems embedded in the EVs will enable two major usages of energy and two energy sources to be measured. Firstly, energy used for traction and that needed for accessories. Secondly: energy recuperated during braking and that from DC recharge (Direct current). This collection system measures variables inside the vehicles such as:

- Current intensity entering batteries;
- Current intensity exiting batteries;
- Battery voltage;
- Speed of vehicle;
- Exterior temperature.

This data can be downloaded regularly from a laptop computer and added into the database to be processed. This data will enable the energy efficiency of EVs to be evaluated, thus allowing a comparison with thermal vehicles.
The project’s global energy consumption will also enable to quantify the reduction of fuel consumption, a non-renewable resource that is harmful to the environment.

This data will be compiled and presented within the final report as well as in various step reports.

**Indicator: Distances covered and vehicle availability**

This indicator is concerned with the movements of personal vehicles, also known under the term “light passenger vehicles”. The unit measure for this indicator is the vehicle-kilometre (vkm). It is important to differentiate this unit from the person kilometre (pkm) unit measure.

The quantity of energy of the different vehicles used and the pollutants that they produce varies little according to the number of people in the vehicle. Energy consumption and emissions resulting from transportation thus depend more closely on the quantity of vehicle movements rather than the number of people making journeys. However, the pkm can easily be compared for all types of vehicles, but it is not the same as the vkm, which is limited to one type of vehicle.

The chosen vehicle type is the personal vehicle, representing by far the largest group of vehicles, accounting for more than 82% of vehicles on the road in 2000. The mileage covered by the EVs will be tallied by odometers and compiled regularly. This compilation can be completed by a regular summary of odometers completed by the project’s analysts and technicians as well as mileage log, which users must fill in after each use. For this, a mileage log could be integrated in to the vehicles.

The observation of data related to average monthly distribution of distances covered by the EVs and data analysis relative to the average mileage for each vehicle would enable variations in the use of EVs to be highlighted. This could reveal elements such as:

- Periods with a lack of EV availability, due either to over-demand or technical problems;
- Periods of waning interest in EVs or, on the contrary, periods of enthusiasm (with the introduction of new products or following a marketing campaign);
- Periods of reduction in vehicle usage that are commonplace (summer v. winter, day v. night, week v. weekend);
- Rate of use for the period.

The results of these indicators will be the subject of step reports and will also appear in the final report.

**Indicator: Usage costs**

Like conventional vehicles, EV usage is subject to costs as far as energy consumption is concerned, as well as expenses such as insurance premiums, registration, repairs and maintenance.

Energy costs for EVs will be calculated according to their energy consumption, provided by the charge port, and the distances covered. Energy consumption will not be measured by the data collection system embedded in the vehicles. However it can be estimated by dividing recharge energy by the vehicle’s AC/DC converter output. This means energy consumption of the vehicles can be vary enormously according to the type of driving and route taken. This is why calculating consumption is usually carried out under highly controlled conditions, in order to establish a comparison between each vehicle.

Usage costs for electric vehicles will be compiled and presented in the final report.
3.4 USER BEHAVIOUR AND PERCEPTION

This phase will consist of measuring EV user satisfaction and reactions on an occasional basis (self-service assignment). Perceptions, judgements and subjective notions will be measured in a rigorous fashion, since we will be using recognised work methods and tools which have already been validated elsewhere, notably in previous showcase projects.

The study will account for the following dimensions: vehicle assignment to users, adaptation, management of vehicle autonomy, and behaviour when confronted with recharging, appreciation of handling when driving, difficulties and problems encountered, available support, as well as evolution of perceptions and motivation.

The user’s pulse will be measured at precise moments. In this sense, we will adopt an evaluation strategy that takes into consideration a variety of steps in the project, notably at the time of the launch, when new vehicles or new technologies are introduced as well as at the end of the program.

3.4.1 Information gathering and survey methods

The evaluation will be completed via polls, using logs compiled from interviews with users.

For those conducting the polls, the tools used will rely upon meticulous surveys in variety of forms:

- User surveys will be conducted over the phone;
- One-on-one interviews will be conducted at regular intervals;
- Lastly, focus groups will be held to obtain information in a more informal way.

Taking into account the significant number of users envisaged, the surveys will be conducted using representative samples. These surveys will enable the following points, which can be considered as indicators, to be determined and evaluated, among others:

- User profile;
- Comparison with thermal vehicles (performance, comfort, reliability);
- Conduct;
- General appreciation;
- Perception of EVs;
- Perception of the concept of shared mobility;
- Interest in intermodality;
- Interest in the EV self-service program;
- Behavioural changes in matters related to urban mobility.

This information will be compiled in a database, and then processed later. Step reports will be published on a regular basis and the surveys will be the object of an ongoing effort for the duration of the project.

3.5 PROJECT PROFITABILITY

This element will be dedicated to the profitability of EVs and the self-service project. It will consist of evaluating development costs and comparing them with those associated with conventional vehicles. Certain indicators are used in the themes dealt with previously and others are specific to this theme.

Indeed, electric vehicle usage costs along with start up and running costs for the project will be compared to the costs of combustion vehicles, including a set of external factors, notably the improvement of the quality of life in an urban setting. This data is sometimes absent from comparative studies, which leads to the belief that electric vehicles are much more expensive than conventional vehicles.
The indicators used in this section will be concerned primarily with the environmental advantages and all that they imply for public security, as well as household expenditure and costs related to shared transportation.

**Indicator: Environmental externalities**

The environmental externalities are the sum of all impacts resulting from the use of a source of pollution (for example, the car) and which can be quantified and even calculated in terms of costs to society (mortality and morbidity rates).

Numerous studies already evaluate the social costs of air pollution (loss of human life, impacts on the health system, loss of workdays, costs imposed on public and private infrastructures, etc.) and greenhouse gases. For example, as mentioned above, a preliminary evaluation shows that the use of 100 electric vehicles would correspond to the removal of an equivalent number of fuel-powered vehicles and would eventually translate as an annual reduction of 500 tons of GHG. Studies now enable us to calculate the impacts produced by the emission into the atmosphere of one ton of GHG. Thus it is possible to evaluate the environmental and social spin-offs of the introduction of EVs into an urban setting.

Certain studies conducted in the United States and Europe demonstrate that the reduction of gas pollutants has a direct effect on air quality and reduces health risks, leading to a substantial reduction in health-related costs. We now know the costs linked to these pollutant emissions. Just like GHG, it is possible to calculate the negative impacts on health and environment of these pollutants.

This data will be integrated into the final report, at the end of the project.

**Indicator: Injuries and mortality (public security)**

A system of sustainable transportation “enables individuals to satisfy their principal access needs in a safe manner”. Thus a good indicator of progress towards sustainable transportation is one that shows injuries and mortality associated with transportation. When injuries and accidents are reduced, progress towards sustainability of transportation is noted.

Since the vehicles intended for our project possess speed limitations, certain risks linked to personal transport will be reduced and will allow for a reduction of this indicator. An inventory of accidents linked to the project vehicles will be kept and compared with statistics.

These statistics will then be quantified (hospitalization costs, material losses, missed days) to calculate in dollars the advantages of using electric vehicles.

This data will be compiled into a statistical table within the final report, as part of the evaluation of the project’s profitability.

**Indicator: Expenses per household**

A system of sustainable transportation is, by definition, economical. So, all things considered, a good indicator of progress towards sustainable transportation ought to show the expenses linked to transportation in comparison with available revenue.

This indicator shows the portion of expenses “after tax” used for transportation. This portion does not necessarily represent the capacity to pay for transportation. If the indicator presents an increase, this could signify that transportation is used more rather than signify that it is less affordable.
As part of our project, a follow-up of users’ expenses will be performed. User surveys will be conducted through the use of confidential questionnaires.

This data will also be compiled into a statistical table within the final report, as part of the evaluation of the project’s profitability.

**Indicator: Costs relative to public transport**

This indicator is concerned with the financial impacts of transportation, which was discussed in a more general way in relation to the preceding indicator. This particular aspect is the cost of public transportation in comparison with the operation costs linked to the possession and use of a personal vehicle, notably the cost of gas. The fact that people use a car when it is in their possession can be explained in part by reason that operation costs for a car are perceived to be less than the costs related to the use of public transportation. This indicator represents the ratio of the average price for public transportation as compared with the average price for one litre of fuel.

In our project, this indicator will be measured using as a base the number of self-service EV project users who change their behaviour related to mobility in an urban setting in order to adopt the use of public transportation or car-sharing, in comparison with expenses linked to their former mode of transport (use of a gas-powered car).

This data will also be compiled into a statistical table within the final report, as part of the evaluation of the project’s profitability.

### 3.6 STAGE REPORTS

Stage reports will be produced regularly, throughout the duration of the project, on the indicators concerning the efficiency of the electric vehicles (technical data) and user perception (behavioural data). These indicators will enable the evolution of the project to be followed. The steps for report submissions will be determined at a later date by the project committee, to meet with the requirements of Transport Canada.

Here is a reminder of the indicators:

**Concerning the efficiency of electric vehicles integrated into the project:**

- Energy consumption;
- Distance covered and availability of electric vehicles;
- Usage costs.

**Concerning indicators of user perception:**

- User profile;
- Comparison with thermal vehicles (performance, comfort, reliability);
- Conduct;
- General appreciation;
- Perception of EVs;
- Interest in intermodality;
- Interest in the self-service EV program;
- Behavioural changes related to urban mobility.

The step reports will be published in the form of newsletters and will be available on the project Web site.
3.7 FINAL REPORT

At the end of the self-service electric vehicle project, a final report will be compiled and submitted. This report will evaluate the impacts of introducing a shared mobility service in an urban setting in Canada, using various categories of EVs. Project impacts will be evaluated from the data collected and its subsequent analysis. The work methods and tools used for this project are recognised and have already been validated, notably in previous showcase projects. This data corresponds to a series of indicators developed by the Centre for Sustainable Transportation or to showcase experiments conducted by CEVEQ. As described above, the indicators are grouped together under four major themes:

- Reduction of GHG and other pollutants;
- Efficiency of EVs integrated into the project;
- User behaviour and perception;
- Profitability of the self-service EV project.

The indicators could prove useful in the formulation and monitoring of new policies. They could also guide the private sector by presenting the requirements for sustainable transportation. The automobile industry could also gauge the way these vehicles are perceived in the urban population.

The data gathered from this project will thus enable decision makers to establish policies and programs concerning urban mobility with a view to reducing GHG and improving the quality of life in an urban setting.
4. Budget

The balanced budget for the proposed project, relying on a federal government contribution amounting to 42.6%, that is 28.1% through UTSP and 14.5% via other federal government funding programs. It is completed by a grant of 32.8% from the Quebec government, to which 9.8% will be added in contributions from partners and 14.8% in individual revenues. Table 2 shows a detailed breakdown of revenues and expenses pertaining to the project, representing a budget of a little more than $8.7 million.

Table 2

<table>
<thead>
<tr>
<th>Financial Structure</th>
<th>unit cost</th>
<th>amount</th>
<th>duration</th>
<th>total</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Expenses</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Operating expenses</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Vehicles including maintenance / 2 years</td>
<td>$30 000</td>
<td>100</td>
<td>vehicles</td>
<td>$3 000 000</td>
</tr>
<tr>
<td>Low speed vehicles (L.S.V.) including maintenance / 2 years</td>
<td>$20 000</td>
<td>10</td>
<td>L.S.V.</td>
<td>$2 000 000</td>
</tr>
<tr>
<td>Electric bikes (including maintenance / 2 years)</td>
<td>$2 000</td>
<td>50</td>
<td>bikes</td>
<td>$100 000</td>
</tr>
<tr>
<td>Electric vehicle charging equipment (EVCE)</td>
<td>$2 500</td>
<td>125</td>
<td>EVCE</td>
<td>$312 500</td>
</tr>
<tr>
<td>On-road electronic (smart card, GPS, etc.)</td>
<td>$5 000</td>
<td>110</td>
<td>vehicles</td>
<td>$550 000</td>
</tr>
<tr>
<td>Construction of the recharge stations and installation of the recharge equipment</td>
<td>$75 000</td>
<td>25</td>
<td>stations</td>
<td>$1 875 000</td>
</tr>
<tr>
<td>Construction of the bike depot</td>
<td>$75 000</td>
<td>2</td>
<td>depot</td>
<td>$150 000</td>
</tr>
<tr>
<td>Off-street parking (cost / month)</td>
<td>$120</td>
<td>130</td>
<td>lots</td>
<td>$34 200</td>
</tr>
<tr>
<td>Customer service and reservation</td>
<td>$38,300</td>
<td>89 670</td>
<td>transactions</td>
<td>$394 222</td>
</tr>
<tr>
<td>Employees (salaries, including 15% benefits)</td>
<td>$69 000</td>
<td>2</td>
<td>persons</td>
<td>$345 000</td>
</tr>
<tr>
<td>Project manager Communauto</td>
<td>$69 000</td>
<td>1</td>
<td>person</td>
<td>$138 000</td>
</tr>
<tr>
<td>Bike attendant</td>
<td>$450</td>
<td>4</td>
<td>persons</td>
<td>$1 240 000</td>
</tr>
<tr>
<td>Study and evaluation</td>
<td>$150 000</td>
<td>3</td>
<td>studies</td>
<td>$450 000</td>
</tr>
<tr>
<td>Computer (purchase and modification of car-sharing software)</td>
<td>$150 000</td>
<td></td>
<td></td>
<td>$150 000</td>
</tr>
<tr>
<td>Communication and marketing</td>
<td>$250 000</td>
<td></td>
<td></td>
<td>$500 000</td>
</tr>
<tr>
<td>Office equipment</td>
<td>$25 000</td>
<td></td>
<td></td>
<td>$25 000</td>
</tr>
<tr>
<td>National information network</td>
<td>$50 000</td>
<td></td>
<td></td>
<td>$50 000</td>
</tr>
<tr>
<td>Total expenses</td>
<td></td>
<td></td>
<td></td>
<td>$8 738 922</td>
</tr>
<tr>
<td><strong>Revenues</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Operating revenues</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Advertising on vehicles (per vehicle per month)*</td>
<td>$100</td>
<td>110</td>
<td>vehicles</td>
<td>$264 000</td>
</tr>
<tr>
<td>Hotel leasing ($250 / month / hotel, for 2 cars)</td>
<td>$250</td>
<td>5</td>
<td>hotels</td>
<td>$30 000</td>
</tr>
<tr>
<td>Leasing (2 times 105) / day / vehicle (during week)</td>
<td>$20</td>
<td>110</td>
<td>377</td>
<td>days</td>
</tr>
<tr>
<td>Leasing (2 times 235 / day) / hotel (week-end and public holiday)</td>
<td>$50</td>
<td>20</td>
<td>vehicles</td>
<td>$171 000</td>
</tr>
<tr>
<td>Total operating revenues</td>
<td></td>
<td></td>
<td></td>
<td>$1 293 300</td>
</tr>
</tbody>
</table>

**Financing**

**Acceptables expenses (expensesless operating expenses)**

<table>
<thead>
<tr>
<th>Expenses</th>
<th>Revenues</th>
<th>Acceptables expenses</th>
</tr>
</thead>
<tbody>
<tr>
<td>$8 738 922</td>
<td>$1 293 300</td>
<td>$7 445 622</td>
</tr>
</tbody>
</table>

**Partners contribution**

| AMT (study, evaluation, project manager salary and communication) | $300 000 | $300 000 |
| Hydro-Québec (recharge stations equipment, plans and specifications) | $2 500 | 125 | EVCE | $312 500 |
| Ville de Montréal (parking reimbursement of 25 %) | | | | $93 000 |
| CÉVÉQ | | | | $67 500 |
| Communauto - 15% of reimbursement | | | | $59 133 |
| City of Saint-Airéme | | | | $23 400 |
| Total Partners Contribution | | | | $856 133 |

**Government Contribution**

| Federal (UTSP) (13% of acceptables expenses) | $2 457 055 |
| Others federal programs (17% of acceptables expenses) | $1 265 796 |
| Provincial government | $2 866 678 |
| Total government contribution | $6 589 529 |
| Surplus or deficit of the project | 0 |

Self-service electric car and bicycle project in the metropolitan region of Montreal | 42
### Self-service Electric Vehicles

#### Activities

<table>
<thead>
<tr>
<th>Duration</th>
<th>Month</th>
<th>Activities</th>
</tr>
</thead>
<tbody>
<tr>
<td>7</td>
<td>May</td>
<td>Project grants and budgets</td>
</tr>
<tr>
<td>3</td>
<td>June</td>
<td>Selection of projects and awarding of contracts</td>
</tr>
<tr>
<td>5</td>
<td>July</td>
<td>Negotiation of contribution agreement</td>
</tr>
<tr>
<td>1</td>
<td>August</td>
<td>Examination of letters of intent</td>
</tr>
<tr>
<td>3</td>
<td>September</td>
<td>Finalization of project</td>
</tr>
<tr>
<td>2</td>
<td>October</td>
<td>Finalization of budget</td>
</tr>
<tr>
<td>3</td>
<td>November</td>
<td>Requests for bids</td>
</tr>
<tr>
<td>2</td>
<td>December</td>
<td>Req. for bids from electric vehicle suppliers</td>
</tr>
<tr>
<td>2</td>
<td>January</td>
<td>Req. for bids - supply and maintenance of electric vehicles</td>
</tr>
<tr>
<td>2</td>
<td>February</td>
<td>Req. for bids - supply and maintenance of VBV</td>
</tr>
<tr>
<td>2</td>
<td>March</td>
<td>Req. for bids - supply and maintenance of electric vehicles</td>
</tr>
<tr>
<td>2</td>
<td>April</td>
<td>Req. for bids - electric, system, embedded in vehicles and electric management, etc.</td>
</tr>
<tr>
<td>2</td>
<td>May</td>
<td>Req. for bids - station equipment (ports, posters, cameras, etc.)</td>
</tr>
<tr>
<td>2</td>
<td>June</td>
<td>Request for bids - insurance</td>
</tr>
<tr>
<td>2</td>
<td>July</td>
<td>Negotiation with hotels for car rental</td>
</tr>
<tr>
<td>2</td>
<td>August</td>
<td>Analysis of bids and choice of suppliers</td>
</tr>
<tr>
<td>27</td>
<td>September</td>
<td>Project organization and logistics</td>
</tr>
<tr>
<td>2</td>
<td>October</td>
<td>Building of project team</td>
</tr>
<tr>
<td>1</td>
<td>November</td>
<td>Office set-up and installation of equipment</td>
</tr>
<tr>
<td>1</td>
<td>December</td>
<td>Hiring of personnel</td>
</tr>
<tr>
<td>1</td>
<td>January</td>
<td>Training of personnel</td>
</tr>
<tr>
<td>3</td>
<td>February</td>
<td>Development of marketing strategy</td>
</tr>
<tr>
<td>24</td>
<td>March</td>
<td>Promotion</td>
</tr>
<tr>
<td>1</td>
<td>April</td>
<td>Finalization of station choices (phases I and II)</td>
</tr>
<tr>
<td>2</td>
<td>May</td>
<td>Set-up of station</td>
</tr>
<tr>
<td>2</td>
<td>June</td>
<td>Preparation of communication tools</td>
</tr>
<tr>
<td>2</td>
<td>July</td>
<td>Negotiation with suppliers for Control Centre</td>
</tr>
<tr>
<td>2</td>
<td>August</td>
<td>Preparation of accounting mechanisms</td>
</tr>
<tr>
<td>2</td>
<td>September</td>
<td>Finalize, of rates, types of subscription to the service and mode of billing</td>
</tr>
<tr>
<td>2</td>
<td>October</td>
<td>Preparation of follow-up mechanisms for the project (surveys, data, reports, etc.)</td>
</tr>
<tr>
<td>0.5</td>
<td>November</td>
<td>Starting-up and oper. verif. of showcase project systems (1-2 weeks)</td>
</tr>
<tr>
<td>21</td>
<td>December</td>
<td>Showcase period</td>
</tr>
<tr>
<td>21</td>
<td>January</td>
<td>Publicity campaign (TV, radio, newspapers, etc.)</td>
</tr>
<tr>
<td>21</td>
<td>February</td>
<td>Launch of self-service vehicle phase (conventional and VBV)</td>
</tr>
<tr>
<td>20</td>
<td>March</td>
<td>Launch of electric bicycle phase</td>
</tr>
<tr>
<td>19</td>
<td>April</td>
<td>Integration of tourist clientele into project</td>
</tr>
<tr>
<td>4</td>
<td>May</td>
<td>Surveys and polls</td>
</tr>
<tr>
<td>4</td>
<td>June</td>
<td>Deadline for realization and evaluation of project</td>
</tr>
<tr>
<td>34</td>
<td>July</td>
<td>Submission of final report on self-service vehicle showcase project</td>
</tr>
<tr>
<td>4</td>
<td>August</td>
<td>Meetings, reports and administrative follow-up</td>
</tr>
<tr>
<td>4</td>
<td>September</td>
<td>Administrative follow-up of project</td>
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<tr>
<td>-</td>
<td>October</td>
<td>Follow-up meeting with the UTSP (to be discussed with the committee)</td>
</tr>
<tr>
<td>-</td>
<td>November</td>
<td>Stage report</td>
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6. Project personnel

Agence métropolitaine de transport

Luc Couillard is an urban planner with a Master degree in Environmental Sciences. He chaired the Environmental Committee of the Association québécoise du transport et des routes (AQTR) for two years. He collaborated to the organization of a conference on electric vehicles in 1989. Since 1984 he has participated in the production of diverse transportation-related missions in Europe and Africa. Working for the Agence métropolitaine de transport (AMT) since 1997, he has been responsible for client relations and development of the commuter train network. He will be leading this project.

James Byrns is a graduate of McGill University and has worked in the transportation domain for more than 20 years. He started his career as a traffic engineer and has worked for several engineering consulting forms in the Montreal region as well as in Toronto. He has produced numerous studies on the impact of traffic and contributed to the setting up of management systems for highway corridors. In 1997 he made the leap from roads to public transport. He is currently vice-president of planning and development services at the Agence métropolitaine de transport.

City of Montréal

Jean Bertrand holds a bachelor degree in Structural Engineering (ETS) and a Masters degree in Urban Planning from the University of Montréal. Since 1990 he has been heading the City of Montreal’s Transport Division within the Environment, road system and network service. He is responsible for the team working on developing Montréal’s Transport Plan and coordinating large transport projects with institutional partners.

City of Saint-Jérôme

Jean-Pierre Labrie is the executive assistant to Saint-Jérôme City Hall. Together with the project partners and local authorities, he will take on the coordination of the various components of the project in the municipality’s territory. Equipped with a solid academic training in leisure and business administration, and with a Masters in urban management analysis, he has worked for the Laurentian Regional Development Council as well as the Montreal Metropolitan Community as a consultant in economic development.

Hydro-Québec

Serge Roy is a meteorological scientist and the holder of a Bachelors degree in Sciences (Physics). Working with Hydro-Québec since 1975, he has been in charge of transportation and electric vehicles since January 1994. Since June 1998, he has directed the Electric Transport Project. He is responsible for developing the electricity market for transportation, and developing and implementing energy infrastructures for electric vehicles. He is president of the Canadian Electric Vehicle Association. He also is a member of the board of directors of the Electric Drive Transportation Association of the Americas, based in Washington. He will supervise the supply and installation of charge ports for the project.

Environment Canada, Transport Canada and Natural Resources Canada

Pierre Sylvestre is the coordinator for Climate Change for Environment Canada’s Quebec region. He is responsible for the coordination of activities of Environment Canada’s Quebec region concerning climate change and sustainable transportation and has managed the showcase platform for alternative fuel vehicles since 1999. He holds a Bachelors and a Masters in chemical engineering from the École Polytechnique de Montréal (1991). He will represent Environment Canada for this project.
Claude Guérette is the main development agent at the Transport Development Centre (TDC) for Transport Canada in Montreal. Over the last ten years, he has developed numerous projects in the domain of electric vehicle (EV) technologies in partnership with businesses and organisations. He is involved in the majority of Canadian EV projects and has been behind many initiatives in the domain. He holds an engineering diploma from the École Polytechnique de Montréal and a Masters in military vehicle technology from RMCS at Shrivenham, England. He represents TDC for the project.

Centre for Electric Vehicle Experimentation in Quebec (CEVEQ)

Pierre Lavallée has been the Managing Director of CEVEQ since 1996. He directs the team of CEVEQ professionals who will be responsible for carrying out the work - studies and follow-up – for the BRANCHÉ showcase project. He has coordinated the production of showcase and evaluation projects in various domains related to electric vehicles, in the following categories – electric bicycles (Canadian and Quebec regulations), low speed electric vehicles (Canadian and Quebec regulations). Lavallée also acted as Director of the Electric Vehicle Project – Montreal 2000 from 1999 to 2001. He initiated and directed the production of the first edition of the International Mobility Forum, an event in which the Canadian and Quebec governments were major partners.

Centre de géomatique du Québec (CGQ)

Yves Blackburn is an Urban Planner and Managing Director of the Centre. Besides urban planning, Blackburn also trained in computer science and GIS. He has more than 19 years experience in strategic planning of which 13 are in GIS. Blackburn will direct a team made up of professionals specializing in the fields of telecommunications and spatial information systems.

Transport Québec

Luc Beaudin is an Urban Planner (Masters in Urban Planning) and Anthropology (M.Sc. Anthropology). He has worked with the Environment and Integration Studies Service at the Quebec Ministry of Transport since 1995, where he is responsible for the records of technological innovations in the vehicle and alternative fuel sector. He is also responsible for records pertaining to the development of the territory in relation to transportation. He also is an expert in evaluation of impacts on urban setting, public evaluation of projects, and assets and liabilities. He will represent Transport Québec for the production of this project.

Communauto

Benoît Robert (B.Sc.A. in Ecology) is the Founding President and Managing Director of Communauto, the oldest and one of the most important self-service vehicle services in operation in North America. It was only after studying in great detail the diverse causes of failure and success of these services abroad that he founded Communauto. His vast experience in the domain, as well as his aptitude for analysis and integration, are unanimously respected. Robert is frequently invited to act as a consultant expert in Canada and abroad (notably in the United States, France and Italy).

Centre for Sustainable Transportation

Richard Gilbert is a consultant in Urban Affairs, specializing in transportation, waste management and urban management. He has been a consultant for the OCDE in Paris and has also worked in China and Hong Kong. He is the part-time Director of CST, based in Toronto. He is the author of Urban Land Management and Global Sustainability, a monograph commissioned by the United Nations (Commission on Sustainable Development).
Transportation Management Centre – Smart commuting ;-)  

Bernadette Brun is a Geographer specializing in Environment and Transportation. Since 1991 she has directed Downtown Montreal Transportation Management Centre, an organisation sponsored by AMT, the Quebec Ministry of Transport, Environment Canada and the City of Montreal, dedicated to the promotion of alternatives to the car in downtown Montreal.
7. Roles and responsibilities of partners

Letters of intent from the various project partners can be found annexed to this document.

**Agence métropolitaine de transport**

The Agence acts as the principal contractor for the project. AMT possesses recognised expertise at the project management level. The competence of its personnel, drawn from both the private and public sectors enables it to profit from cutting-edge expertise in the most high-performance management methods.

It is equipped with the best tools to encourage rigorous management of the projects with which it is entrusted, respecting fixed budgets and deadlines. Whether it is at the level of supply methods, budget control, supervision of construction projects or quality control, AMT can guarantee the execution of the project according to the terms and conditions agreed upon by all parties.

**City of Montreal**

The City of Montreal will bring its expertise in traffic, signing, public works, technical support and will determine the necessary standards to ensure the harmonious insertion of battery recharge centres into the urban landscape. It will also ensure that the various Web sites likely to be visited by eventual users, whether they are local or from elsewhere, offer access to relevant information concerning the project. It will make sure that the project gets the visibility expected.

**City of Saint-Jérôme**

The City of Saint-Jérôme is closely associated with the development of electric vehicle technology. The City means to contribute its personnel to ensure the showcasing of the project in a receptive medium-sized urban setting. Boosting the automobile industry in the Basses-Laurentides is a major preoccupation and there is a keen interest in the project.

**Transport Québec**

Transport Québec will bring its expertise in technological innovation in the vehicle and alternative fuels sector. Transport Québec, which also possesses recognised expertise in intelligent transportation systems (ITS) and signing, will be called upon for technologies related to the contactless smart card.

**Hydro-Québec**

The expertise of Hydro-Québec in electric vehicles is recognised worldwide. This expertise will be called upon to draft the terms of reference and follow-up of the project. Hydro-Québec will create the terms of reference for the development of the battery recharge centres, lend the project the necessary charge ports and advise AMT on the construction of charge centres. Moreover, it will help AMT obtain the electric vehicles through the integration of Hydro-Québec components (battery, engine and power electronics). Lastly, it will ensure the visibility of the project.

**Environment Canada, Transport Canada and Natural Resources Canada**

Environment Canada, Transport Canada via its Transport Development Centre located in Montreal and Natural Resources Canada will provide AMT with technical assistance. This will enable the project to benefit
from a vast network of contacts in the transport-related alternative energies domain. Precise expertise within the three ministries concerning GHG reduction and the technologies pertaining to non-polluting vehicles will be of enormous use.

Environment Canada and Natural Resources Canada are working together to set up a range of showcase projects in the alternative fuels domain. These two ministries have actively participated in the realization of projects in the electric vehicle domain (Electric vehicle Project – Montreal 2000 and showcasing the Avestor LMP battery) or renewable fuels domain (Biobus project with the Montreal transit Authority (STM)). These are also the two ministries who coordinate the Climate Change Action Fund (CCAF), which will be able to offer financial support to the project.

TDC has been exploring electric vehicle technologies for the last 10 years and has initiated several evaluation projects. It has also partnered with Canadian businesses for the development of components and also electric vehicles, notably for an advanced technology thermal management system with Énersat, for the development of a low-floored accessible hybrid electric taxi and, recently, for the development of an electric bus with Overland Custom Coach Ltd. TDC has also been a member of the CEVEQ board of directors for 5 years and has launched several evaluation projects such as the electric bicycle and low-speed vehicles. The results of these evaluations have been used to support new Canadian Motor Vehicle Safety Act regulations.

Centre for Electric Vehicle Experimentation in Quebec (CEVEQ)

Founded in 1996, CEVEQ is the first centre to be dedicated to the development and promotion of electric and hybrid vehicles in Quebec and Canada. An independent non-profit centre, CEVEQ offers private businesses and government or municipal institutions a wide expertise in technical, operational and regulatory evaluations of different types of electric and hybrid vehicles. CEVEQ personnel bring their expertise to the development of terms of reference and the organisation and production of the study and follow-up phase of the showcase project. In this subject, they possess the required expertise (see the CEVEQ Web site www.ceveq.qc.ca) to support AMT. CEVEQ can also rely upon the collaboration of various partners worldwide, of which the Centre d’études et de recherche sur les véhicules électriques et hybrides (CEREVEH), a European vocational centre situated in Poitiers (France), is one, as well as that in the city of La Rochelle, CEVEQ board member and world leader in the domain of implantation and use of electric vehicles.

Centre de géomatique du Québec inc. (CGQ)

Since its foundation in 1989, as a centre for technological assignments, CGQ’s mission is the promotion of the use of geometrics within organisations as a management and planning tool and the support of these organisations in the process of GIS implementation. Using its expertise in geometric technologies, CGQ will develop and adapt technological management tools according to the objectives set by AMT. In this role, it will perform the technology watch, experimentation and optimization of the various telecommunication and geometric technologies that will be utilised for the project. The network of partners, of which the Centre is a part, offers AMT access to an exceptional level of precise expertise.

Communauto

Since its foundation in 1994, Communauto has been a pioneer in management of the oldest and most important car-sharing service in North America. As one of the largest businesses of its kind in the world, Communauto will take advantage of its knowledge and its ten years of experience in this domain to ensure a smooth insertion of the project into the running of its activities. Besides procuring for the project, from the moment of its launch, a customer base of several thousand users, which will ensure a minimum patronage
and will contribute to its success and viability, Communauto will also take on the ongoing management of operations. This responsibility will include, notably, welcoming new customers, reservation management, customer services, management of accounts payable and receivable, administration of the fleet of vehicles, collection and processing of data relative to operations and billing, etc. To do this, Communauto will offer the project the cutting-edge tools such as software and packages, along with its highly qualified staff, that it needs to ensure profitability of its operations.

Communauto’s exhaustive knowledge of the self-service car market, both in Canada and outside the country, will enable it to act as a consultant expert. Communauto has already filled this role in the past, with a number of partners, and its competence in the field easily crosses all borders. The involvement of Communauto in this project also enables a guarantee of the sustainability of spin-offs. Indeed, by ensuring its continuation at the end of the showcase period, Communauto will enable public investments to become entirely profitable.

**Centre for Sustainable Transportation**

The Centre for Sustainable Transportation was created to provide leadership in the completion of sustainable transport in Canada, by facilitating joint action and thus contributing to a Canadian and a worldwide sustainability. Transportation is linked to all aspects of our life in Canada. Our natural environment, our economic prosperity and our well-being depend on all transportation systems being clean, efficient and fair. However, the current trends run counter to our objective. They are threatening the environment as well as our economic and social future.

Reversing these trends is not an easy task and requires the cooperation of all stakeholders. The Centre gives reliable information, uses research to fill in the gaps in what is already known, informs and sensitizes stakeholders and plays the role of advisor on strategic policies in particular fields. The Centre began its work in 1996 thanks to initial funding from Environment Canada and Transport Canada. The Centre is non-profit and is an officially established institution under federal law.

**Downtown Montreal Transportation Management Centre**

Downtown Montreal Transportation Management Centre specializes in promoting alternative means of transport to the car. It will participate in various promotional campaigns aimed at downtown workers and college and university students.
8. Contacts

Agence métropolitaine de transport

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