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**CHALLENGES FOR THE SUSTAINABLE  
DEVELOPMENT OF ROAD SYSTEMS**

**TAKING SUSTAINABLE DEVELOPMENT INTO  
CONSIDERATION IN QUEBEC'S ROAD  
TRANSPORTATION SYSTEM: A DAILY CHALLENGE AT  
THE MINISTÈRE DES TRANSPORTS DU QUÉBEC (MTQ)**

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## SUMMARY

With the adoption in 2006 of the *Sustainable Development Act*, the Government of Quebec established a management framework for all government departments and public service agencies. The Ministère des Transports du Québec (MTQ), which had already adopted in 1992 an environmental policy consistent with a strategy to foster sustainable development, will continue—as part of efforts to continually improve—to take sustainable development into account in its products, services and activities.

This report provides an overview of the situation as regards both the steps taken by Quebec with respect to sustainable development and those taken by the Ministère des Transports du Québec, particularly as regards road transportation. Sustainability issues were identified in the Ministère's 2005-2008 Strategic Plan. These issues were divided under the three pillars of sustainable development, i.e., the environmental (🌍), social (👥) and economic (💰) fields. An analysis of each of these issues makes it possible to assess the steps taken by the Ministère with respect to sustainable development and examine actions and achievements.

In order to ensure appropriate consideration for the environment and sustainable development, the Ministère intends to implement an environmental management system (EMS)—a comprehensive approach to environmental management and sustainable development—which would become part of its management system and be ISO 14001 compliant, in continuation of its environmental policy. All of the management tools implemented will be coherently organized to make sure environmental and sustainable development issues are appropriately taken into account in day-to-day management, thus fostering the ongoing improvement of its environmental performance.

The Ministère, whose sustainable development efforts are consistent with government priorities, will ensure that sustainable development is taken into account in the transportation sector, and more particularly in road transportation. It is currently developing various action plans for implementation, including one with a particular focus on sustainable development. These ongoing efforts will benefit all of society in Quebec. With the desired cooperation of various government departments and agencies, Quebec will proudly take its place among the group of nations assuming their responsibilities and ardently working to protect our planet Earth.

## INTRODUCTION

In Quebec, sustainable development is more than just a trendy concept. In fact, the Quebec government has implemented a new management framework that commits all departments and agencies to the pursuit of sustainable development objectives, most notably through the *Sustainable Development Act*. This includes the ministère des Transports du Québec (MTQ) and its line of business, which is transportation. This report, which deals exclusively with the road transportation system, examines several sustainability issues to put the government's efforts to achieve sustainable development in Quebec into context, along with those of the MTQ. It also presents some of the results that have been achieved thanks to these efforts.

# 1 SUSTAINABLE DEVELOPMENT IN QUEBEC: A NEW MANAGEMENT FRAMEWORK

## 1.1 Global background

Without going into a detailed history, it is worth recalling that the 1972 United Nations Conference on the Human Environment, held in Stockholm, provided an opportunity to consider social and environmental factors within the context of development and globalization. It also led to the creation of the United Nations Environment Program (UNEP). In 1980, the *World Conservation Strategy* provided a definition for “sustainable development,” which was clarified and improved in 1987 by the World Commission on Environment and Development (WCED), also known as the Brundtland Commission for its Chair, Gro Harlem Brundtland. The WCED defined sustainable development as “development that meets the needs of the present without compromising the ability of future generations to meet their own needs” (WCED, 1988;<sup>1</sup> IUCN, UNEP, WWF, 1980). Around the world, the concept of sustainable development is pursuing its course, as are the concepts of biodiversity and climate change, which are interrelated.

In 1992, the concept of sustainable development was enshrined at the first Earth Summit in Rio de Janeiro, where it was given prevalence as a development approach for the nations. Subsequent Earth Summits reflect this approach, and international organizations such as the United Nations (UN), the Organisation for Economic Co-operation and Development (OECD), the Agence Internationale de la Francophonie (AIF) and the World Road Association (PIARC) incorporate it into their strategic planning. Like Canada and Quebec, many other countries, lead among others by France and Belgium, have embarked on government efforts toward sustainable development in their own fashion.

## 1.2 The government’s efforts to achieve sustainable development

Following the 1972 Stockholm conference, Quebec created a department of the environment (ministère de l’Environnement du Québec (MENV)). In the 1980s, it officially embarked on the path toward sustainable development by participating in the work of the World Commission on Environment and Development and endorsing the objectives of the Brundtland report. In 1991, an interdepartmental committee on sustainable development was formed with a view to harmonizing the government’s various activities in that area and to introduce that concept and its principles in the development of Quebec government policies, plans, and programs.

## 1.3 The Sustainable Development Plan

In November 2004, the MENV tabled a draft bill respecting sustainable development and published its Sustainable Development Plan (MENV, 2004a, 2004b, 2004c). The plan revolves around the following components: public consultation; sustainable development legislation; a government strategy for sustainable development; actions taken by government departments and public agencies; an evaluation, monitoring, and accountability mechanism that calls for the creation of the position of sustainable development commissioner; and finally, participation by all levels of society (MENV, 2004b).

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1. Subsequently, in 1991, in a publication titled *Caring for the Earth: A Strategy for Sustainable Living*, the World Conservation Union, the United Nations Environment Program and the World Wildlife Fund defined sustainable development as “improving the quality of human life while living within the carrying capacity of supporting ecosystems” (IUCN, UNEP, WWF, 1991).

### 1.3.1 The *Sustainable Development Act*

In February 2005, in support of this priority, the Quebec government renamed its department of the environment the department of sustainable development, the environment and parks (ministère du Développement durable, de l'Environnement et des Parcs (MDDEP)). The public and interest groups were then invited to participate in the consultation process pertaining to the Sustainable Development Plan and draft bill, which took place in the course of a regional tour of 21 cities and towns across Quebec between February and May of 2005. The public consultation process provided the MDDEP with more than 550 briefs and attracted the participation of more than 3,500 individuals. Following this process, Bill 118 respecting sustainable development was tabled in the National Assembly on June 13, 2005, and the *Sustainable Development Act* became law on April 19, 2006 (Government of Quebec, 2006a). With it, a Green Fund was created, and a new right was added to Quebec's *Charter of Human Rights and Freedoms*.

### 1.3.2 The government's sustainable development strategy

The government's strategy constitutes a frame of reference for sustainable development designed to ensure the consistency and cohesiveness of actions taken by the public administration in this area. This strategy is based on a vision—"A society in which the quality of life of citizens is and remains a reality. A responsible, innovative society that is capable of excellence in all of its accomplishments. A society that is committed to harmonizing economic vitality, environmental quality, and social equity." [translation]—along with three fundamental issues regarding knowledge, responsible action, and social commitment (MDDEP, 2006a). These issues are expressed as nine orientations, which have been developed into 29 objectives. Once the government strategy has been adopted, some 150 public administration bodies will be committed to planning their actions and setting their priorities in the realm of sustainable development in accordance with this frame of reference, which will remain in force for at least five years.

## 2. SUSTAINABLE DEVELOPMENT AT THE MTQ

The MTQ has been taking environmental issues into consideration since the 1970s, and has produced some interesting results, through both concrete action and general measures. In fact, the first environmental assessments conducted date back to that decade.

### 2.1 Environmental Policy

In 1992, the MTQ confirmed its commitment to the path of sustainable development by adopting an Environmental Policy (MTQ, 1994). In doing so, the MTQ acknowledged its environmental responsibility, particularly with respect to finding solutions to transportation-related environmental problems. In addition, the supporting document titled *Éléments de problématique et fondements de la Politique sur l'environnement du ministère des Transports du Québec* [issues and foundation of the MTQ's environmental policy] (Sauvé, 1994) acknowledged that adoption of the concept of sustainable development as the foundation for the policy called into question the organization's very culture, values, and traditions.

## 2.2 Strategic Plan

With the implementation of its 2000-2003 Strategic Plan (MTQ, 2001a, 2000), the MTQ incorporated sustainable development into its mission, which was published in the 2005-2008 plan: “To ensure the mobility of people and goods throughout Quebec on safe, efficient transportation systems that contribute to the sustainable development of Quebec” (MTQ, 2005a). Within the context of the 2005-2008 Strategic Plan, the MTQ identified five issues related to transportation systems: sustainable development, the safety of road users, the conservation of infrastructures, services to the regions and markets, and urban mobility (MTQ, 2005a). It also defined three major challenges that the transportation sector will face in the coming years:

1. Consolidating existing networks to address the issues of user safety and the conservation of transportation infrastructures
2. Optimizing transportation issues to address the issues of services to the regions and markets as well as urban mobility, within the context of the sustainable development of transportation
3. Modernizing the MTQ to improve its ability to provide quality services at the best possible cost (MTQ, 2005a)

With a view to acquiring the means to meet these challenges, three orientations were defined and subdivided into ten courses of action covering all MTQ activities: the safety of road users, the conservation of infrastructures, the operation of infrastructures, international and interregional networks, urban networks, the environment and sustainable development, research and innovation, resource management, relations with public and private partners, and relations with the public and with companies. Twenty-one objectives were set, organized around this structure. The course of action pertaining to the environment and sustainable development establishes two objectives in the transportation sector. One targets the development and implementation of Quebec’s Sustainable Development Plan while the other targets the development and implementation of the government’s climate change strategy.

## 3. SUSTAINABILITY ISSUES THAT AFFECT THE TRANSPORTATION SECTOR

The MTQ has already embarked on the path of sustainable development of its own initiative, in keeping with its commitments. In order to allow for a brief assessment of the progress that has been made from the perspective of continuous improvement, sustainability issues were defined based on the courses of action that were included in the MTQ’s strategic plan. Issues were organized around the three pillars of sustainable development: the environment (🌍), society (👥), and the economy (💰). An analysis of each of these issues makes it possible to evaluate the MTQ’s efforts in the area of sustainable development, determine areas where improvement is needed, and examine its actions and achievements.

### 3.1 The environment

#### Preserving biodiversity (🌍1)

Preserving biodiversity in Quebec is the fundamental issue in the Quebec government’s Biodiversity Strategy 2004-2007, to which the MTQ contributes (MENV, 2004d, 2004e). In fact, the MTQ had already acknowledged its environmental responsibilities in the first principle of its Environmental Policy: “The MTQ plans, designs, and carries out its

mandates and activities with the environment in mind. It assumes its share of responsibility in terms of resolving transportation-related environmental problems.” The MTQ undertakes to “conduct environmental assessments with a view to preserving the balance of ecosystems, ecological processes, and biological diversity, and to integrate all of the components of the natural and human environments into the environmental assessment process” (MTQ, 1994).

## Combating climate change (🌍2)

Studies indicate that average temperatures in south western and south central Quebec have risen by 0.75 to 1.25 °C between 1960 and 2003 (Yagouti, Boulet and Vescovi, 2006). Even though Quebec had the best record for greenhouse gas (GHG) emissions per person in Canada<sup>2</sup> in 2003, the various modes of transportation released GHGs that contained close to 34 million tonnes of CO<sub>2</sub> equivalent into the atmosphere. That represents more than one-third of Quebec’s total GHG emissions from all sectors. Road transportation (cars, trucks, and buses) accounts for 85.9% of transportation-sector emissions, and 32.1% of total GHG emissions in Quebec (MDDEP, 2006b).

These facts make it clear that combating climate change involves tremendous challenges and calls for immediate concerted action. For the MTQ and its partners (agencies, transit corporations, associations, research centres and universities, private enterprise, etc.), the battle is being fought on two main fronts:

- Reducing GHG emissions; and
- Adapting to climate change.

## Improving energy efficiency (🌍3)

Effective action aimed at reducing GHG emissions depends on reducing fuel consumption. In light of this, the government’s new energy strategy, titled *Using energy to build the Quebec of tomorrow*, not only focuses on developing Quebec’s energy potential, but also on using energy more efficiently to increase the prosperity of Quebecers, improve environmental protection, and be better prepared to meet future challenges (Ministère des Ressources naturelles et de la Faune - *Ministry of Natural Resources and Wildlife* - MRNF, 2006). With its clear emphasis on renewable resources, energy efficiency, and new technologies, the energy strategy presents challenges to every sphere of activity. It is also worth noting that the use of petroleum products and their derivatives, especially in the transportation sector, is primarily responsible for GHG emissions in Quebec. In addition, the bulk of Quebec’s energy bill is spent on oil, all of which is imported. From an environmental perspective, as well as on a social and economic level, it is entirely in Quebec’s best interest to minimize its consumption of petroleum products. Therefore, the transportation sector must do its share, because petroleum products make up virtually the entire market in this area.

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2. Quebec—12.1 tonnes of CO<sub>2</sub> equivalent (t CO<sub>2</sub>-eq.), Canada—23.4 t CO<sub>2</sub>-e, Alberta—23.4 t CO<sub>2</sub>-e (MDDEP, 2006b).

## 3.2 Society

### Contributing to safer roads (###1)

Unsafe roads are known to incur a high social and economic cost<sup>3</sup> and are a major public concern. Despite a sharp rise in the number of vehicles, Quebec's road safety record has improved significantly in recent decades (MTQ and SAAQ, 2001). Prevention is strongly emphasized, but given the recent upward trend in the number of deaths and serious injuries, other measures and actions are also planned in an effort to sustain the level of performance.

### Improving the mobility of people and goods in Quebec's cities and the quality of life of Quebec residents (###2)

Although Quebec motorists prefer vehicles with low fuel consumption, the automobile fleet (pleasure vehicles; vehicles used for institutional, occupational, or business purposes; and off-highway vehicles (OHV)) has grown steadily over the past decade<sup>4</sup> (Lepage and Zal, 2006). In light of this, and in the spirit of equity, accessibility and mobility have become major sustainability issues for the MTQ. Mobility applies to the transportation of people as well as of goods.

In light of the fact that public transit fosters urban development, prosperity, and the quality of life of city dwellers, and that it is consistent with the concept of sustainable development, the MTQ encourages this form of transportation, whether in the guise of urban public transit systems, taxis, or carpooling. With respect to the transportation of goods, the focus is primarily on developing intermodal systems.

### Reviewing relations with public and private partners (###3)

The government having signed agreements with municipal and regional authorities respecting decentralization and regionalization, the MTQ is in the process of determining what departmental actions and programs could be implemented by municipalities or regional county municipalities (RCMs), and will eventually proceed with decentralization based on the government's decisions in that regard. The MTQ will also endeavour to adapt its programs to regional characteristics.

### Improving services and relations with the public and with companies (###4)

In order to improve services and relations with the public and with companies, the MTQ, in association with its partners, plans to create a government portal for transportation and set up online departmental services. This portal will bring together all of the online services already available in this field of activity so that people can engage in transactions with the departments and public agencies concerned directly, securely, and efficiently, all at one site. With the creation of the One-Stop Centre for Carriers, the first steps have already been taken. Once it is launched, the portal will provide access to a variety of MTQ, Société de l'assurance automobile du Québec (SAAQ – Québec Motor Vehicle Insurance Corporation), and Commission des transports du Québec (CTQ) services.

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3. It was estimated that a 15% reduction in accidents in the 2001-2005 period would produce a "social benefit" of approximately \$1.8 billion (MTQ and SAAQ, 2001).

4. According to the Institut de la statistique du Québec, there were 5.2 million vehicles in 2004. 74.4% of these were pleasure vehicles, which represents a 20.9% increase compared to 1996. In the same period, the fleet of heavy vehicles of 3 tonnes or more increased by 13.7%, public transit vehicles increased by 8.5%, and the number of snowmobiles (161,440) and OHVs (294,706) set new records (Lepage and Zal, 2006).

### 3.3 The economy

#### Preserving collective heritage assets ( 1)

Occupying a land area of more than 1.6 million km<sup>2</sup> and with a population of approximately 7.6 million people in 2005, Quebec has a vast road network concentrated in the southwest and southern regions, where six metropolitan areas (urban agglomerations), including Montréal and Quebec City, are home to 66% of the population and 68% of jobs.

The 185,000 kilometres of Quebec's road network are under the jurisdiction of the MTQ (primary road network; actual length of 29,157 kilometres), municipalities (local road network; approximately 90,500 kilometres), the ministère des Ressources naturelles (MRN—resource access roads; approximately 61,500 kilometres), Hydro-Québec (approximately 3,300 kilometres), and the federal government (approximately 500 kilometres) (MTQ, 2006a). The primary road network managed by the MTQ is divided into five categories (Table 1). Users travel close to 90 billion kilometres on Quebec roads every year.

The structures that are managed by the MTQ in its road network include 4,924 culverts longer than 4.5 m, bridges that cross over waterways, overpasses, retaining walls, tunnels, and pumping stations.

The road network is an important part of the collective heritage, and represents a vital asset for the economy and society of Quebec. However, it is also ageing. Most of the freeways were built in the 1960s and '70s, as were most of the many structures in the MTQ's road network.

#### Ensuring the sustainable operation of infrastructures ( 2)

Primary road network operations include winter maintenance, routine maintenance and periodic summer maintenance, as well as network monitoring and corridor road management.

Table 1 - Quebec's Primary Road Network—Structure and Characteristics (MTQ, 2006a)

Category	Actual length <sup>5</sup> (km)	Characteristics
Highway	5,625	Freeway infrastructures
Provincial	8,898	Main interregional and intercity roads
Regional	5,455	Roads connecting large agglomerations to each other and to secondary agglomerations
Collector	7,743	Roads connecting small towns (population under 5,000) to larger towns, directly or via a higher-category road
Access to resources	1,436	Roads for accessing natural resources, recreational, or public conservation areas, excluding roads managed by the MRN
Total:	29,157	

#### Improving Quebec's international AND interregional transportation networks ( 3)

5. Actual length is obtained by subtracting the connections at the end from those at the start of a section of road, and including all pavements (not the number of lanes). For example, a road with two or four adjoining lanes that is L kilometres long has an actual length of L (because of the single pavement), while a section of road with separated pavements (with a right and left pavement that are each L kilometres long) has an actual length of 2L. Ramps are included in this length.



From the standpoint of sustainable development, concerted planning of the main transportation corridors and harmonization of the standards accepted by North American transportation authorities is necessary to carry out major projects for improving traffic flow and safety on the main routes connecting Quebec to its leading economic partners, and to finish interconnecting Quebec's regions.

#### Supporting transportation research and innovation (📄4)

In addition to establishing a research program, the MTQ encourages the use of new technology in transportation systems. In particular, intelligent transportation systems (ITS) have considerable potential for making transportation networks safer, more efficient, more reliable, and more environmentally friendly, without necessarily having to physically modify the existing infrastructure (Saucan and Lefebvre, 2005). ITSs have been installed at strategic locations along the road network, where they play a decisive role in terms of the environment and safety by improving traffic flow, enabling swifter emergency response, and facilitating the transportation of people and goods.

### 3.4 Departmental governance

Environmental protection, social progress and economic efficiency are integral components of the government's concept of sustainable development and, therefore, its departments and public agencies—including in particular the MTQ—must create an approach to governance that addresses these main objectives in a harmonious manner.

## 4 ACCOMPLISHMENTS IN SUSTAINABLE DEVELOPMENT

Without compiling a comprehensive inventory of accomplishments in the area of sustainable development, this report includes examples of how the concept has been taken into consideration for each of the issues associated with sustainability, organized around the pillars of sustainable development.

### 4.1 The environment

#### Preserving biodiversity (🌍1)

In applying the *Environment Quality Act*, and even in undertaking many road projects not subject to this Act, the MTQ has carried out a large number of biophysical and human environmental impact studies. The findings of these studies have led the MTQ to propose and implement a number of mitigating measures. For example, in the course of doubling the pavement of Highway 55 in the Eastern Townships (southern Quebec), the MTQ built a passageway for large wildlife using an existing structure, among other things (Gagné, 2005). This step helped reduce the negative impact of road traffic on herds of white-tailed deer and improve the safety of road users.

In the rehabilitation project for Highway 175 connecting the Saguenay–Lac-Saint-Jean administrative region to Quebec City, the provincial capital, the MTQ plans to raise the level of a lake to compensate for sporadic losses of fish habitats and wetlands, and to build a 50-km-long metal fence with passageways under the roadway at suitable locations to control the movement of large wildlife, and thereby improve road safety. The action plan also includes eliminating salt ponds in the road corridor, installing signs to mark at-risk zones, and implementing a communication plan for road users (Martel and Turgeon, 2006).

Recent studies report that the road network is a vector for the proliferation of certain invasive plant species, such as common reed grass (*Phragmites australis*), whose pollen is an allergen for approximately 10% of the population, as is ragweed (*Ambrosia artemisiifolia*) (Jodoin, 2006; Lavoie, 2006). The MTQ has commissioned the Université Laval to carry out a research project titled Phragmites. The objectives of this project include assessing the invasion of Quebec's highway rights-of-way by reed grass and refining the tools used for the ecological management of roadside vegetation, factoring in the plant's benefits (Lafrance, 2006).

With respect to ragweed, which is the main cause of nasal allergy—commonly referred to as hay fever—that affects one in ten Quebecers, the MTQ has been a member of the Table québécoise sur l'herbe à poux [Quebec roundtable on ragweed] (TQHP) since its inception. In 2005, the TQHP launched a new educational campaign with the slogan: "Ragweed, my NOSE knows!," the aim of which is to increase public awareness of the plant's harmful effects on health, and the need to control it. The MTQ is aware that ragweed grows on its green shoulders, and generally within two metres of the pavement, and it has accordingly commissioned McGill University to carry out two research projects. One is aimed at controlling ragweed by planting a competitive groundcover along autoroutes (Di Tommaso and Massicotte, 2002), while the other is aimed at eliminating ragweed by using a natural product—a saline solution (Watson, Buron and Costa, 2005).

Landscaping is also a consideration, as evidenced by the example of the extension of the Robert-Bourassa Autoroute, which among other things had a visual impact on Parc de l'Escarpement, which is one of the last remaining sizeable urban forests within the boundaries of Quebec City. The highway ran through the centre of the forest, creating a major break in visual and functional continuity. The mitigating measures that were implemented included planting all surfaces that were affected by the work, building gullies and mounds with varied slopes, planting unaligned trees along the boulevard, moving the bicycle path and sidewalk toward the interior of the park, and landscaping the area between the boulevard or sidewalk and the bicycle path. An urban-type bridge was built, with mitigating measures that included stabilizing and replanting the embankments with native species, developing a pedestrian trail, and careful architectural treatment of the bridge (Groupe HBA experts-conseil, 2004).

## Combating climate change (🌍2)

Reducing GHG emissions depends on programs and actions aimed at energy efficiency, the development and use of public and alternative transit, the development of intermodal transportation for goods, support for technical innovation, and educating the MTQ's partners and the public. Within the framework of the Quebec government's 2006-2012 action plan on climate change, the MTQ plans to adopt a GHG-emissions standard for light vehicles sold in Quebec as of 2010 (the proposed standard is the same as the one in effect in California); to force gasoline distributors to include 5% ethanol content in the fuel sold by 2012 (ethanol produced locally from forest biomass, agricultural residues and residual matter); to encourage municipalities to pass by-laws respecting the idling of vehicles by 2010; etc. (Government of Quebec, 2006b). The MTQ has already launched several projects aimed at reducing GHGs, particularly involving technological innovation in the vehicle sector and replacement fuels (BioMer, 2005; Lamy, 2001; etc.).

Regardless of the measures taken today to reduce GHG emissions, climate change will have a manifold impact on the transportation of tomorrow. The MTQ is already working on activities and infrastructures with a view to being prepared to deal with those changes,

including studies, projects and work that is underway in regions that have already been affected.

### Improving energy efficiency (🌍3)

Energy efficiency has been a concern for the MTQ from an environmental and financial perspective for many years, but the May 2006 launch of Quebec's 2006-2015 Energy Strategy provided a precise framework for implementing a series of short-, medium- and long-term measures (MRNF, 2006). These measures address transportation by automobile (improving the performance of automobiles in Quebec, carpooling, more fuel-efficient driving), public transit (upgrade of infrastructures, various incentives), and the transportation of goods (mandatory inspections of heavy vehicles to verify energy efficiency, coastal shipping, transfer to rail transportation, and the development of technologies for improving energy performance, such as refrigeration by truck). Other steps directly involve the public sector, which has a duty to set an example, and call for reducing transportation (to 20% less than the 2003 level by 2010) or modifying the administration's purchasing policy in favour of energy-efficient equipment and facilities.

## 4.2 Society

The MTQ endeavours to integrate the principles of sustainable development into its strategic orientations and program implementation on a social level, as well as on the environmental and economic level.

### Contributing to safer roads (🚗1)

Along with its efforts to enhance the efficiency and quality of transportation systems, the MTQ attaches tremendous importance to road safety, as evidenced by the road component of the Transportation Safety Policy established in 2001 (MTQ and SAAQ, 2001). Performance-wise, Quebec ranks among the top road authorities in terms of lowest death rates per billion kilometres travelled. Despite the fact that the number of vehicles on the road rose from 2.3 million in 1973 to 5.1 million in 2003, the number of deaths dropped over that same period, from 2,209 to 621 (MTQ 2006a). In an effort to decrease emergency response times and improve traffic flow in general, the MTQ has introduced a set of strategies and tools, including traffic management centres, which are already in service in several urban agglomerations, most notably in the Montréal and Quebec City areas.

### Improving the mobility of people and goods in Quebec's cities and the quality of life of Quebec residents (🚶2)

The separation between home and work, and especially the lengthening distances between those two places, has led to the increased use of motor vehicles—particularly cars—by suburban residents. Within this context, the MTQ is focusing its efforts on *integrated planning*. Transportation plans are a good example of this. Updates are increasingly being carried out with a view to sustainable development; these take regional characteristics into consideration through mechanisms for consulting the local population and regional development agencies during the development process.

From an environmental (reducing pollution and GHG emissions), social (equity, accessibility, road safety), and economic (diminishing the costs associated with traffic congestion) point of view, the MTQ supports *public transit* through various programs and

projects. Since 1995, the use of public transit has grown steadily,<sup>6</sup> but judging from recent trends, the situation remains fragile. In light of this, the main objective of the government's new public transit policy is to increase use of this mode of transportation throughout Quebec, both in urban and rural areas (MTQ, 2006b). The specific goal is 8% growth in ridership by 2012, which will increase public transit's share of all passenger transportation modes.

The plan for achieving this includes splitting costs fairly between municipalities, governments, and users; improving available services (tax incentives for employers and users, annual financial support, improved safety and security in public transit); upgrading and developing infrastructures and equipment (public assistance for various programs, support for innovation, improved access to transportation for the mobility-impaired); and supporting alternatives to the automobile (interregional transportation by bus, improved access to taxis, support for public transit in sparsely populated regions, encouraging travel by foot or bicycle).

Noteworthy elements of the recently announced fiscal measures include a 200% deductibility for employers applicable to ticket purchases for their employees, which is also a non-taxable benefit for employees; a tax credit for public transit riders; and reimbursement of the diesel fuel tax for public transit agencies, with a view to improving services.

In addition, the government assistance program for public transit in rural areas, which has been in place since January 1, 2003, aims to improve access to efficient and effective services, in partnership with rural area players (35 projects supported by the MTQ in 2004-2005). Furthermore, the MTQ-managed government assistance program for paratransit for the disabled gave approximately 65,000 individuals access to this form of transportation in 2003. That same year, paratransit services were offered in 817 out of a total of 1,118 municipalities, and in 2004-2005, 73 taxis were modified under the program to carry wheelchair-bound clients.

It is also worth noting that the MTQ has introduced a number of programs and measures to encourage alternatives to the solo use of automobiles, including carpooling and active transportation. In this respect, the MTQ provides the public with a database that motorists can use to offer seats in their cars for trips between home and work. Within the same context, there is a program that provides financial support to workers interested in purchasing public transit passes.

In 1995, a policy regarding cycling was adopted as a framework for action on the road network that is under the jurisdiction of the MTQ, taking into consideration the needs of cyclists. As a result of this policy, along with initiatives by municipal and regional partners, Quebec had more than 7,000 kilometres of bicycle paths in 2005, including 3,400 km along the cyclable Route verte. The MTQ developed 83% of the 4,353-km-long Route verte, and is responsible for its maintenance.

It is widely recognized that traffic congestion in urban areas not only causes pollution and GHG emissions, but also entails substantial costs for the local economy. A recent study

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6. In 2003, ridership in large urban agglomerations totalled 510 million. This increase of over 58 million is largely due to greater use of public transit (subway and bus) on the Island of Montréal (47% of the increase) and commuter trains in the Montréal area (16% of the increase). Yet similar results are found in other regions (Quebec City, Gatineau). In 2004, this put Quebec in first place in Canada for number of public transit trips per resident (94.6), ahead of Ontario (79.8) and Alberta (66.8) (Quebec, 2006).

estimated the socioeconomic cost of recurring congestion<sup>7</sup> in the Greater Montréal Area in 1998 at \$779 million (2004). In addition, the latest origin-destination survey by the Agence métropolitaine de transport (AMT) in Montréal revealed that, despite gains in public transit, the motorization rate in the 1998-2003 period was 9%, which represents 65,000 more automobiles. Furthermore, the 2004 survey of vehicles in Canada revealed that the heavy class (gross weight of 15 tonnes or more) drove an average of 74,450 kilometres throughout Quebec.

### Reviewing relations with public and private partners (¶¶3)

The MTQ intends to cultivate and improve relations with its partners. For example, in the Estrie region of southern Quebec—which is facing a very serious problem involving collisions with large wildlife (moose, white-tailed deer and other deer)—the MTQ, in association with the Société de la faune et des parcs (FAPAQ), the Sûreté du Québec (SQ), and the Société de l'assurance automobile du Québec (SAAQ), is implementing a series of actions designed to reduce the number of such collisions. These actions include an annual awareness campaign aimed at drivers, a pilot project involving special licenses for hunting deer outside wooded areas, a verification of signs that are installed or requested, and an annual update of spatial studies to identify at-risk areas (Gagné, 2005).

### Improving services and relations with the public and with companies (¶¶4)

In this respect, social concerns were taken into consideration in various road infrastructure projects. In the case of the redevelopment of Highway 175, the MTQ conducted a psychosocial study of expropriated property owners to assess the impact of the expropriation procedure (Martel and Turgeon, 2006). In the course of building Highway 70 (La Baie area), the economic impact on merchants affected by the traffic shift will be assessed. In addition, the MTQ organizes its own public consultations for every major road development project before the plan is finalized. By doing so, the MTQ can improve its projects in response to feedback from the individuals and groups concerned.

## 4.3 The economy

Market globalization has fostered the growth and diversification of trade. Since the 1990s, a new economy has emerged. Driven more by demand than supply, it has forced businesses to adjust, particularly in terms of inventory management (just-in-time). Within this context, the equation between economic growth and the development of transportation systems becomes clear: the greater flexibility that is required by businesses is largely based on mobility.

### Preserving collective heritage assets (¶ 1)

It is within this same context that the MTQ has made the preservation of transportation issues a top priority. Aware of its ageing infrastructures, the MTQ has in recent years increased its investments in preserving and upgrading roadways and structures. A great deal of work remains to be done, but there is little doubt that these investments are producing results. In an effort to determine the quality of the road network, the MTQ uses the international roughness index (IRI), which measures driving comfort. Based on this index, 77.5% of the strategic network for supporting external trade and 62.1% of the Quebec network were in good condition in 2005.

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7. Congestion caused by road network demand (traffic volume) exceeding supply (fixed). It occurs mainly during the morning and evening rush hours.

The MTQ is also concerned with *protecting and preserving the cultural heritage* related to transportation. One example of this is covered bridges. Between the mid-19th century and 1958, more than 1,000 covered bridges were built in Quebec. Only 91 of these quaint relics of a bygone era remain. The threat of demolition of covered bridges in almost every region of Quebec has revived public interest in preserving these structures. In light of this, the MTQ undertook an inventory update, and structural inspections were conducted with the specific intent of assessing the tourism value of this heritage.

#### Ensuring the sustainable operation of infrastructures ( 2)

Until very recently, the edges of highways, from the road shoulder to the adjacent properties, were mown at different heights, with only the two metres immediately next to the pavement—precisely where ragweed spreads—being cut low. The new approach adopted by the MTQ, known as ecological vegetation management, eliminates mowing except for the first two metres next to the pavement, where it might even be increased in order to ensure clear visibility (road safety) and allow markers to be seen, which would lead to both better ragweed control and improved visual quality (MTQ, 2005b). This approach involves allowing local plants to spread to provide road users with a diversified floral landscape. The growth of trees will be controlled through simple cyclical scything, as required. In 2004-2005, 70% of roadsides were subject to ecological vegetation management. In 2005-2006, the rate rose to 80%.

In an effort to reduce the environmental impact of roadside ditch maintenance, the MTQ has standardized the bottom-third technique, which involves reducing ditch dredging to a strict minimum and treating nature as an ally (MTQ, 2005c). Only the lower third of the total depth of the ditch is dredged, and then only when necessary. A number of advantages have become apparent, including a sharp reduction in ditch bank erosion, a substantial decline in sedimentation at the bottom of ditches, greater harmony between the road corridor and the surrounding agri-forest landscape, lower costs due to the increase in daily kilometrage of ditches cleaned and a 30% to 60% reduction in the volume of dredgings to be disposed of, property-owner satisfaction with the greater stability of ditches, and a sharp drop in sediment volume and the flow of contaminants (of agricultural or other origins) to natural waterways. In terms of winter maintenance, an environmental management plan for road salt is currently being developed in cooperation with the government departments and agencies concerned.

#### Improving Quebec's international and interregional transportation networks ( 3)

Quebec had a greater volume of exports and imports in 2005 than in the previous year.<sup>8</sup> Road transportation remains the leading mode in terms of value of the merchandise carried, accounting for 62% of the value of trade with the United States, and 27.4 % of the value of trade with Mexico, which has increased by 8.5% since 2000 (Gamache, 2006).

In addition to other efforts to encourage intermodal systems, which are a major vector of sustainable development in transportation, the MTQ has implemented two major programs: an assistance program for upgrading rail transportation infrastructures, aimed at short-line railways<sup>9</sup> (objective: to set up intermodal infrastructures); and the Marine

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8. Quebec exports to the United States—its main trading partner—grew by 2.9%, resulting in a \$32.6 billion trade surplus. After the United States, Quebec's top three export markets are the United Kingdom, Japan and France, which expanded to a value of \$3.6 billion. With respect to imports, after the United States, the four main sources in order of magnitude are China, the United Kingdom, Algeria, and Norway (Gamache, 2006).

9 Short-line railway: a local or regional carrier operating a so-called secondary or low-density track, and usually only carrying freight to or from the territory that it serves.

Transportation Policy and its action strategy (MTQ, 2001b). As a result, the number of railcars on short-line tracks rose from 200,062 in 2004 to 204,474 in 2005. In addition, three marine and intermodal infrastructure projects enabled the transfer of more than 500,000 tonnes of merchandise from roads to river barges in 2005-2006 alone.

Within this context, the MTQ and its partners are putting forth sustained efforts to enhance the efficiency of the main international and interregional corridors, by carrying out major road network improvement projects (the strategic network to support external trade<sup>10</sup>) and through increased cooperation with neighbouring administrations. New technologies, such as ITSs, are also being deployed. The Lacolle border crossing is a prime example of this.

#### Supporting transportation research and innovation ( 4)

Information and communications rank among the key characteristics of sustainable mobility. Therefore, in an effort to address the concerns of road users in this regard, the MTQ has set up Inforoute, a one-stop road information centre. It is also contributing to the creation of a more complete system known as “511,” which will improve travel planning for users and emergency response times (police, ambulance, firefighters, roadside assistance, etc.). Many associations and agencies that work with the MTQ attach special importance to travel-planning systems and optimal routes. These systems help reduce fuel consumption, which produces a positive impact on the environment and public health, not to mention the resulting savings. From the same standpoint of improving mobility, the MTQ also favours the creation of reserved lanes, especially for public transit and carpooling.

#### 4.4 Departmental governance

The MTQ aims to take a proactive approach to the government’s effort toward sustainable development. It is involved with the work of the interdepartmental committee on sustainable development and the groups formed by this committee, and it plans to participate in major intersectoral projects that will be undertaken by the government with a view to creating the synergy required for the implementation of the government’s strategy, which is expected to be adopted in 2007.

In compliance with the *Sustainable Development Act*, the MTQ will produce a departmental sustainable development action plan, which will be monitored annually. In fact, the MTQ’s annual management report already covers the Quebec Auditor General’s recommendations pertaining to sustainable development, and tracks the objectives of the 2005-2008 Strategic Plan (MTQ, 2006a). Within this new context, the MTQ will have to follow through on the recommendations put forth by the sustainable development commissioner.

Although it is interesting—and worthwhile—to list sustainable development achievements to recount success stories and aim for widespread application, the MTQ realizes that, within the context of the globalization of environmental issues, it must go farther in terms of taking the environment and sustainable development into account. In this vein, it has begun to reposition the *Environment* function and set up an environmental management steering committee, which will be mandated to coordinate the planning and creation of a departmental environmental management system.

In an effort to ensure that the environment and sustainable development receive proper consideration in all of its products, services, and activities, the MTQ intends to introduce a

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10. The strategic network to support external trade is a subset of the primary road network, spanning 7,722 km (actual length) and consisting of transportation infrastructures that support Quebec’s trade with the rest of Canada and with leading foreign partners, particularly the United States.

comprehensive approach to managing the environment and sustainable development. This approach will become a component of its management system, as an extension of its environmental policy, and will comply with ISO Standard 14001. All of the tools that will be put into place will be organized consistently in order to ensure proper management of environmental and sustainable development issues in day-to-day management, thereby fostering continuous improvement in environmental performance.

## **CONCLUSION**

Initiated in 1992 with the adoption of its Environmental Policy, the government's efforts toward sustainable development have been bolstered by the *Sustainable Development Act* and the sustainable development strategy. With the introduction of its environmental management system, the MTQ is ensuring that sustainable development is given due consideration in the day-to-day management of its activities, products and services. The MTQ is preparing a sustainable development action plan, in keeping with the principles set forth in the Act and the objectives of the government strategy that will be adopted in 2007. It is also preparing an integrated plan respecting climate change and energy efficiency. Harmonizing these action plans, along with others involving biodiversity, public transit, etc., will enable the MTQ to measure its progress toward attainment of these objectives.

The fact remains that taking into consideration the fundamental principles of sustainable development, such as equity, cost absorption and polluter-pays, and the objectives related to external factors, environmental conditions and responsible consumer choices, requires a significant degree of coordination among stakeholders in both government and society.

Undertaking major road infrastructure projects continues to spark lively discussions. The MTQ must develop grids that will facilitate the evaluation of the sustainability of its policies, transportation plans, programs and projects. It must also improve coordination with local and regional populations.

By taking sustainable development into consideration, the MTQ is pursuing government priorities and, as a result, the efforts that are put forth in the transportation sector—particularly with respect to roads—will benefit Quebec's society as a whole. With the desired cooperation of the various government departments and agencies, Quebec will be able to proudly join the list of nations shouldering their responsibilities and working hard to care for planet Earth.



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