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Report of the

Commissioner of the Environment and Sustainable Development

to the House of Commons

Chapter 2

Road Transportation in Urban Areas: Accountability for Reducing Greenhouse Gases

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Chapter

2

Road Transportation in Urban Areas: Accountability for Reducing Greenhouse Gases

All of the audit work in this chapter was conducted in accordance with the standards for assurance engagements set by the Canadian Institute of Chartered Accountants. While the Office adopts these standards as the minimum requirement for our audits, we also draw upon the standards and practices of other disciplines.

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Road Transportation in Urban Areas: Accountability for Reducing Greenhouse Gases

Main Points

2.1 As part of the Kyoto Protocol, the federal government agreed to reduce Canada's greenhouse gas emissions to six percent below 1990 levels over the period 2008 to 2012. The transportation sector is the single largest source of Canada's greenhouse gas emissions, accounting for 26 percent of total emissions in 2001. Government initiatives to reduce greenhouse gas emissions in the transportation sector are expected to account for about 12 percent of the reduction in Canada's total emissions.

2.2 For the most part, the federal government's actions in the transportation sector to address greenhouse gas emissions through partnership agreements are in the early stages of implementation. Therefore, now is an ideal time to ensure that the accountability provisions for these actions are sound and that improvements can be made where necessary.

2.3 We examined the accountability frameworks in place for three existing federal programs that include expected results for reducing greenhouse gas emissions in the transportation sector. These programs are Transport Canada's Moving On Sustainable Transportation (MOST) program and its Intelligent Transportation Systems (ITS) initiative, and Natural Resources Canada's Canadian Transportation Fuel Cell Alliance (CTFCA) program.

2.4 In general, reasonable accountability frameworks are in place for the programs examined. However, all three programs have shortcomings that may prevent them from achieving their long-term, expected results for reducing emissions. We also found that the ITS projects we examined did not have provisions for reporting on environmental impacts. In addition, a report on the roll-up of project outcomes into overall program results has not been prepared for the MOST program, although a framework for doing so has been developed for phase 2 of the program.

2.5 These concerns, if not corrected, will make it difficult for the federal government to assess the contribution these programs are making to their stated outcomes, including reducing Canada's greenhouse gas emissions.

2.6 All of the federal government's actions under Action Plan 2000 and the Climate Change Plan for Canada to reduce greenhouse gas emissions in the transportation sector involve partnering with other levels of government or other stakeholders. Therefore, it is critical that the federal government develop partnership agreements with a strong accountability framework, and that all partners, including the federal government, be held to account for achieving their stated performance expectations.

Background and other observations

2.7 Over 70 percent of Canada's greenhouse gas emissions from transportation are generated by road transportation, with the majority occurring in urban areas where most Canadians live. Greenhouse gas emissions from road transportation rose by more than 25 percent from 1990 to 2001.

2.8 In Canada, the federal, provincial, and municipal governments share the responsibility for transportation. Although urban transportation is not a federal responsibility, it has an impact on several areas of federal interest, such as health, the economy, and the environment.

2.9 The increasing demands for transportation are leading to trends that are not sustainable. Reducing emissions from transportation represents both a major challenge and an important opportunity. Many of the actions that could be adopted in transportation may generate multiple benefits that go beyond reducing greenhouse gas emissions. These benefits include cleaner air, improved health, more efficient transportation systems, and reduced congestion—all of which make our cities healthier and more sustainable.

2.10 Individual Canadians generate about half of their greenhouse gas emissions from personal road transportation, and the government expects every Canadian to reduce his or her emissions by 20 percent. Programs focussed on promoting education and awareness to change people's transportation behaviour are an integral part of the federal government's strategy to reduce greenhouse gas emissions.

2.11 Tools such as intelligent transportation systems and new technologies being developed are an important part of the solution. Although the technology of fuel cells using hydrogen is promising, the estimated net reduction in greenhouse gas emissions represents a very small portion of the transportation sector's projected emissions through to 2020.

2.12 It is important that Transport Canada's 2003–2005 sustainable development strategy reflect the vision contained in its strategic document *Straight Ahead—A Vision for Transportation in Canada* so that there is a clear and consistent picture of the results that the Department and the federal government, as a whole, want to achieve in the area of sustainable transportation.

Transport Canada has responded. Transport Canada has generally accepted our recommendations. Its responses indicate what it is doing, or plans to do, to address them.

Introduction

2.13 Transportation involves the movement of people and goods by road, rail, air, or marine. The choices that Canadians make today about the operation and use of transportation systems shape the communities they live in and have an impact on the future sustainability of those communities. A transportation system that is affordable, safe, efficient, and environmentally friendly is a fundamental component of sustainable development.

2.14 Transportation has many benefits. Besides bringing people and goods together, it contributes to the development, growth, and prosperity of Canada and the Canadian economy and to the quality of life of all Canadians. However, transportation also comes at a cost, including environmental, social, and economic impacts (Exhibit 2.1).

Exhibit 2.1 Some environmental, social, and economic impacts of transportation

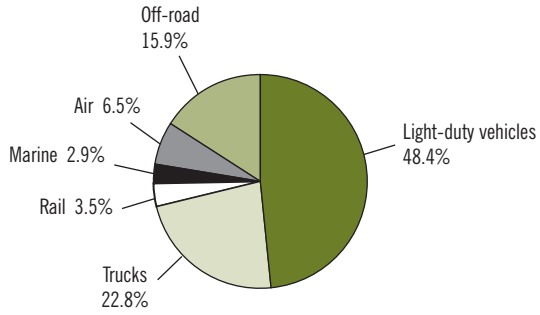
GO Transit photo by Timothy Hudson

Environmental impacts of transportation include air, water, and noise pollution; the unsustainable use of land and other natural resources; community disruption; habitat destruction; and greenhouse gas emissions from fossil fuel combustion that contribute to climate change. The transportation sector is also a major contributor to smog in urban areas. Smog can damage vegetation and have adverse effects on human health, such as impaired lung function, respiratory infection, and asthma. It has also been associated with certain conditions of heart disease (see the Commissioner's 2000 Report, Chapter 4, Smog: Our Health at Risk). Spills and leaks of fuels, oils, and solid and hazardous waste by-products can contaminate land, surface water, and groundwater.

Social and economic impacts can include higher health care expenses, the costs of cleaning up pollution, and the costs associated with accidents and congestion. Congestion can have a severe impact on the efficiency and effectiveness of Canada's transportation system, with delays in the movement of goods increasing costs for businesses and consumers. Congestion also contributes to greater fuel consumption and additional emissions of smog-causing air pollutants and greenhouse gases, which have further impacts on the quality of life and health of individuals.

2.15 According to Environment Canada, the transportation sector is the single largest source of Canada's greenhouse gas emissions, accounting for 26 percent of total emissions in 2001 (the most recent year for which data were available). Road transportation generates over 70 percent of Canada's greenhouse gas emissions from transportation (Exhibit 2.2). Two thirds of these emissions occur in urban areas, where more than three quarters of Canadians live.

Exhibit 2.2 Sources of transportation emissions, 2001



Source: Environment Canada

2.16 **Climate change initiatives.** In December 1997, Canada and 160 other countries negotiated the Kyoto Protocol to the United Nations Framework Convention on Climate Change. The Protocol commits Canada to reducing its greenhouse gas emissions to 6 percent below 1990 levels over the period 2008 to 2012 (Canada's Kyoto target). Canada ratified the Protocol in December 2002.

2.17 In the absence of any new (post-1999) policy and program initiatives, Canada will need to reduce its greenhouse gas emissions by almost 30 percent to meet its Kyoto target. The federal government expects every government, region, sector, and Canadian to do their share in meeting Canada's Kyoto target. It has also stated that the transportation sector will be expected to assume its share of the responsibility for meeting Canada's Kyoto target.

2.18 From 1990 to 2001, Canada's overall greenhouse gas emissions rose by 18.4 percent. Greenhouse gas emissions from the transportation sector rose by over 22 percent, while those for road transportation alone rose by more than 25 percent. A major source of this growth was from light-duty gasoline trucks, which include sport utility vehicles (SUVs) and minivans. From 1990 to 2001, emissions from this category of vehicles increased by over 80 percent. During that period, total emissions from cars decreased by 9 percent.

2.19 The federal government estimates that if current trends continue, greenhouse gas emissions from transportation will exceed 1990 levels by 32 percent in 2010 and by 53 percent in 2020.

Rationale for audit selection

2.20 To help reduce greenhouse gas emissions, the federal government has initiated nine actions in the transportation sector under the Government of Canada Action Plan 2000 on Climate Change and the Climate Change Plan for Canada (Appendix A). All of these actions are expected to be delivered through some form of partnership between the federal government and other levels of government or major stakeholders or both. The federal government estimates that these actions will account for about 12 percent of the total anticipated reductions in Canada's greenhouse gas emissions. This is

considerably lower than the transportation sector's 26 percent share of Canada's total greenhouse gas emissions in 2001.

Fuel cell—A device that converts chemical energy into electrical energy without combustion. In a hydrogen fuel cell, hydrogen is combined with oxygen within the fuel cell to produce electrical energy.

2.21 One of the nine actions is the Canadian Transportation Fuel Cell Alliance program, for which Natural Resources Canada is the lead department. We audited this program because the federal government has supported the development of fuel cell technology for over 20 years and has identified it as a means to clean urban air by curbing emissions from vehicles in Canadian cities. We did not audit the eight other actions because, at the time of our examination, either they were in the early stages of implementation or they did not have a strong focus on urban road transportation.

2.22 Some existing federal activities to reduce greenhouse gas emissions in the transportation sector fall outside Action Plan 2000 and the Climate Change Plan for Canada. Given Transport Canada's overall mandate in the transportation sector, we also wanted to examine the Department's programs or initiatives that were intended to have an impact on road transportation in urban areas and lead to reductions in Canada's greenhouse gas emissions.

2.23 Transport Canada identified its Moving On Sustainable Transportation (MOST) program as a key initiative for enhancing Canadians' awareness of sustainable transportation. While the MOST program has multiple objectives (see paragraph 2.44), one of the expected long-term results of the program is the reduction of greenhouse gas emissions and pollution from the transportation sector. By the end of October 2002, the Department had received 125 applications. Successful applicants are eligible for federal funding to a maximum of $100,000 per project and must obtain a minimum of 50 percent of funding from other sources. The Department has provided funding to 39 applicants. An example of a funded project is BikeShare, which was awarded $47,436 to support the Community Bicycle Network's community bike-lending program in Toronto. BikeShare's 10-year plan is to make a fleet of 1,000 bikes available at 80 hubs throughout the city for short trips around the urban core area.

2.24 Transport Canada was also implementing its Intelligent Transportation Systems (ITS) Plan for Canada. The objectives of the ITS Plan include advancing the safety, efficiency, and security of the multi-modal transportation system, providing increased access to transportation services, and reducing fuel consumption and harmful emissions by improving traffic flow. The Department believes that ITS technologies can improve the environment and the quality of life in both urban and rural areas.

2.25 We believe that now is an ideal time to ensure that the accountability provisions for these three programs are sound and that improvements can be made to these programs and other federal actions in the transportation sector to address greenhouse gas emissions, where necessary.

Transportation is a shared responsibility

2.26 Three levels of government in Canada share responsibility for transportation. The federal government is responsible for national,

interprovincial, and international transportation; for safety standards for new motor vehicles, including emission standards for new vehicles and engines; and for fuel consumption standards for new motor vehicles. Provincial governments are responsible for intraprovincial transportation. Municipalities are responsible for urban transit, local roads and related infrastructure, and local planning decisions.

2.27 **The federal role.** Although urban transportation is not a federal responsibility, it has an impact on several of areas of federal interest, such as health, the economy, and the environment. The federal government does have direct influence on urban transportation systems through its ownership of several large properties—national airports, local port authorities, federal bridges, and roads, many of which are in cities.

2.28 Transport Canada is responsible for the transportation policies, programs, and goals set by the federal government. The Department works to ensure that all parts of the transportation system work effectively and in an integrated manner to provide Canadians with a sustainable system that is safe and secure, efficient, and environmentally friendly. Transport Canada's strategic objectives are to

- contribute to Canada's economic growth and social development,
- ensure high standards for a safe and secure transportation system, and
- protect the physical environment.

2.29 In its *Sustainable Development Strategy 2001–2003*, Transport Canada committed to fostering transportation that is sustainable—economically, environmentally, and socially. The strategy identified the following seven priority challenges:

- improving education and awareness of sustainable transportation;
- developing tools for better decisions;
- promoting adoption of sustainable transportation technology;
- improving environmental management of Transport Canada operations and lands;
- reducing air emissions;
- reducing pollution of water; and
- promoting efficient transportation.

These priorities reflect Transport Canada's vision of respecting the environment and balancing its transportation policies to integrate environmental goals.

2.30 In February 2003, the Minister of Transport released *Straight Ahead—A Vision for Transportation in Canada*. The document describes the vision and strategic directions that will guide federal transportation policies and programs over the next decade. It commits Transport Canada to integrating environmental considerations more systematically in making transportation decisions.

2.31 *Straight Ahead* constitutes Transport Canada's contribution toward the government's commitment in the September 2002 Speech from the Throne—to introduce "a new strategy for a safe, efficient and environmentally responsible transportation system that will help reduce congestion in our cities and bottlenecks in our trade corridors." This strategy, or vision, is also expected to help Canada meet its commitments under the Kyoto Protocol. *Straight Ahead* commits the Government of Canada to placing a high priority on urban transportation needs.

2.32 We would expect to see the vision described in *Straight Ahead* incorporated in Transport Canada's 2003–2005 sustainable development strategy. This is consistent with the expectations for the third round of sustainable development strategies to be tabled in Parliament in December 2003; those expectations were outlined in the March 2003 document issued by the Commissioner of the Environment and Sustainable Development, titled *Sustainable Development Strategies—Making a Difference*. It is important that these two strategic Transport Canada documents provide a clear and consistent picture of the results that Transport Canada and the federal government, as a whole, want to achieve in the area of sustainable transportation.

2.33 Natural Resources Canada is mandated to show regard for the sustainable development and wise use of Canada's natural resources. Its key policy priorities include positioning Canada as a world leader in clean energy and tackling the challenge of climate change and the environment through sustainable development. One of the Department's strategic outcomes is providing Canadians with sustainable economic, social, and environmental benefits derived from natural resources for present and future generations. Another is providing Canadians with strategies for reducing environmental impacts in the natural resources sector. A key focus of the Department is the development and demonstration of clean energy technology, including the production and storage of hydrogen and the development of fuel cells.

Key issues

2.34 As Canada's economy and population grow, so too does the demand for transportation. This in turn is leading to increased negative environmental and health impacts and to trends in transportation that are not sustainable, particularly in urban areas.

2.35 To achieve the objective of developing an integrated, coherent transportation policy framework, Transport Canada recognizes that partnerships and collaboration among governments as well as others are essential. These efforts need to take into account the respective jurisdiction, roles, and responsibilities of all participants.

2.36 All of the federal government's actions under Action Plan 2000 and the Climate Change Plan for Canada to reduce greenhouse gas emissions in the transportation sector involve partnering with other levels of government or other stakeholders. Therefore, it is critical that the federal government develop partnership agreements with a strong accountability framework and

that the partners, including the federal government, be held to account for achieving their stated performance expectations and helping to meet Canada's Kyoto target.

Focus of the audit

2.37 We focussed our audit on road transportation in urban areas because Canada is an increasingly urban nation and road transportation is a major contributor to Canada's greenhouse gas emissions and smog.

2.38 Our overall audit objectives were to determine whether

Accountability—A relationship based on obligations to demonstrate, review, and take responsibility for performance, both the results achieved in light of agreed expectations and the means used. (Source: Auditor General December 2002 Report—Modernizing Accountability in the Public Sector)

- appropriate accountability frameworks are in place for federal programs associated with road transportation in urban areas and for the resulting partnerships that are derived from them, and
- accountability is occurring for the programs covered by the audit.

2.39 The detailed objectives were to determine

- whether there is provision for clear roles and responsibilities,
- whether there is provision for clear performance expectations,
- to what extent provision is made for credible reporting,
- to what extent provision is made for reasonable review and adjustment,
- whether there is credible reporting, and
- whether there is reasonable review and adjustment.

2.40 Our audit focussed mainly on two key departments responsible for implementing programs that have impacts on road transportation in urban areas, namely, Transport Canada and Natural Resources Canada (NRCan). Specifically, we examined Transport Canada's Moving On Sustainable Transportation program and its Intelligent Transportation Systems initiative, and NRCan's Canadian Transportation Fuel Cell Alliance program. We did not, however, undertake a grants and contribution audit of the programs examined herein.

2.41 In addition, our audit included an examination of the involvement of Environment Canada and Health Canada in connection with our case study on changing people's transportation behaviour to reduce their negative impact on the environment.

2.42 For more information on our audit, see About the Audit at the end of the chapter.

Observations and Recommendations

Moving On Sustainable Transportation program

Promoting education and awareness

2.43 In 1999 Transport Canada launched the Moving On Sustainable Transportation (MOST) program as a three-year, $1 million initiative. This was one of the specific commitments made in the Department's first

sustainable development strategy (1997). In January 2002, the program was extended to 2007, with an additional $2.5 million for the second phase, bringing the total funding to $3.5 million over eight years. The Department has identified the MOST program as a key initiative for enhancing Canadians' awareness of sustainable transportation.

2.44 The primary objectives of the MOST program are to

- stimulate the development of innovative tools, approaches, and practices for increasing the sustainability of Canada's transportation system;
- realize quantifiable environmental and sustainable development results on Transport Canada's sustainable development priorities; and
- provide Canadians with practical information and tools for better applying sustainable transportation thinking in their daily lives.

Intelligent Transportation Systems initiative

A tool for improving transportation in urban areas

Highway advisory sign that informs drivers of existing traffic conditions

Source: Transport Canada

2.45 An efficient transportation infrastructure is essential to allow the smooth movement of people and goods. One means of achieving this is through the use of intelligent transportation systems (ITS). The use of ITS technology can

- improve the quality of traffic management, traveller information and vehicle control, commercial vehicle and fleet management, and public transit;
- help manage and reduce congestion, minimize delays for vehicle traffic, detect and reduce the risk of accidents, and monitor highway conditions; and
- enable transportation operators and users to optimize the potential of existing resources and to better integrate services, without necessarily altering the existing infrastructure.

Toll collector devices for vehicles merging onto a toll roadway

Source: Transport Canada

2.46 Transport Canada launched its Intelligent Transportation Systems Plan for Canada in November 1999. The national plan is built on five interconnected components: partnerships for knowledge, development of a national ITS architecture, a multimodal research and development plan, deployment and integration of intelligent transportation systems across Canada, and strengthening of Canada's ITS industry (through development of potential products and services for export).

2.47 Our audit focussed on the deployment and integration component, given that one of its objectives is to reduce environmental impacts, including air emissions, and increase the use of alternative transportation modes. The federal government has made available, under Transport Canada's Strategic Highway Infrastructure Program (SHIP), up to $29 million for the ITS Plan. Departmental officials informed us that a significant portion of this amount is expected to be allocated for deployment and integration activities.

2.48 Of the 16 ITS deployment and integration projects funded under SHIP in 2002, our audit covered the 6 projects that were led by urban municipal governments or their agencies and that focussed on improving road traffic operations. The ITS deployment and integration component offered these municipal applicants cost-sharing contributions of up to 50 percent of eligible costs, to a maximum contribution of $250,000 per project.

2.49 A Transport Canada document for SHIP recognized that ITS technologies are an innovative approach to realizing key government objectives. These objectives include the achievement of national environmental goals, such as the reduction of greenhouse gas emissions by decreasing fuel consumption. This document stated that, among the various SHIP components, the ITS component is likely to have the highest overall environmental benefit. The ITS initiative would have a positive impact on air quality, though the decrease in greenhouse gas emissions would be small on a national scale. The ITS Plan indicated that a study commissioned by the Transportation Climate Change Table on the impact of certain ITS applications on greenhouse gas emissions estimated the reduction in emissions to be about 0.75 megatonnes in 2010. This reduction is comparable to the reductions for some of the actions within the transportation sector, noted in Appendix A.

Canadian Transportation Fuel Cell Alliance program

Advancing the technology

2.50 The Canadian Transportation Fuel Cell Alliance (CTFCA) program, launched in June 2001, is a five-year $23 million initiative administered by Natural Resources Canada as part of Canada's Action Plan 2000 on Climate Change. The program involves hydrogen fuel cell suppliers, fuel providers, the automobile industry, and government.

2.51 The objective of the CTFCA program is to demonstrate and evaluate viable fuelling systems for hydrogen fuel cell vehicles and to develop the necessary supporting framework for the fuelling infrastructure. The program is also expected to demonstrate options for refuelling, address regulatory barriers to the increased use of fuel cell vehicles, establish safety standards for fuelling stations, and develop training and certification programs for people who will install and maintain those stations.

A hydrogen fuel cell system

Source: picture taken by Office of the Auditor General, at General Hydrogen

Prototype fuel cell vehicle

Source: Ballard Power Systems Inc.

Fuelling station

Source: picture taken by Office of the Auditor General, at BC Hydro's Powertech facility

2.52 An objective and a long-term outcome of the program is to shorten the time frame for reducing greenhouse gas emissions in the transportation sector through increased energy efficiency of vehicles and the use of low or zero carbon fuels. Natural Resources Canada estimates that this program will reduce net greenhouse gas emissions by 0.09 megatonnes in 2010 and 2.65 megatonnes in 2020, if hydrogen is produced from the reforming of methane (a carbon-based fuel). This represents only 0.05 percent and 1.2 percent of the transportation sector's projected emissions in 2010 and 2020 respectively.

2.53 In March 2003, Natural Resources Canada announced the first two demonstration projects under this program. One project will develop a hydrogen refuelling apparatus for a natural gas reformer that will be capable of generating hydrogen for both fuel cell vehicles and stationary power generators. The other project will help develop electrolysis technology in a mobile hydrogen fuelling station to generate hydrogen from water.

Accountability results for the programs audited

Roles and responsibilities have been clearly defined

2.54 All three programs we examined provide for clearly defined, understandable, and agreed-upon roles and responsibilities. These include setting out clearly what activities and tasks are expected of each party and how the relationships are to be managed.

2.55 We interviewed key personnel and reviewed departmental and other documents to identify provisions accompanying the assignment of responsibilities and contribution of funds to projects. We reviewed agreements and management frameworks and found that decision-making processes and co-ordination between program staff and funding recipients were clearly set out.

Concerns about performance expectations

2.56 The three programs all have stated performance expectations. However, we found shortcomings that may hinder the departments' ability to meet their expectations. Our examination included reviews of management and accountability frameworks, as well as internal program or project assessments, as appropriate.

2.57 In the case of the Moving On Sustainable Transportation (MOST) program, we would have expected the Department to have developed some approaches to determine how successful the program had been. The objectives of the program, described in paragraph 2.44, include stimulating innovative tools, approaches, and practices for Transport Canada's sustainable development priorities and communicating that information to Canadians. However, there are no clear and concrete performance targets for the outcomes of the overall program, although we found targets have been established at the project level. Practical targets at the program level could be set in a number of ways. One target could entail expecting that all projects—successes and failures—produce reports on lessons learned and communicate this information to Canadians. Another target could entail establishing a success rate for each round of project funding in terms of the percentage of

projects that met their stated objectives, including those projects associated with reducing greenhouse gas emissions and pollution from the transportation sector. Without establishing a success rate and knowing the actual extent of success, Transport Canada will find it difficult to assess whether the program is making progress against its stated objectives.

2.58 Transport Canada provides a link between the MOST program's intermediate outcomes and Challenge 1 of its Sustainable Development Strategy 2001–2003—to "improve education and awareness of sustainable transportation." The Department intends to address this challenge in part through the MOST program. It indicates that Challenge 1 targets for the MOST program have been achieved. These targets involved extending the program by two years, undertaking a review, and implementing a targeted marketing campaign. However, we found that these targets are not quantifiable or outcome-oriented, and they do not help to determine whether Challenge 1 of the Sustainable Development Strategy has been achieved. If this challenge is to be carried forward into Transport Canada's next sustainable development strategy, we would expect the Department to develop targets that are quantifiable and outcome-oriented.

2.59 **Recommendation.** Transport Canada should ensure that the Moving On Sustainable Transportation program has clear and concrete performance targets in which to assess progress against its stated objectives.

Transport Canada's response. Transport Canada accepts the recommendation.

The Department currently assesses progress against MOST's stated objectives through processes outlined in the Results-based Management and Accountability Framework that has been approved by the Treasury Board. This includes rigorous project-level reporting against established goals, indicators, and quantitative targets as well as reporting on program-level performance indicators. The MOST program will aggregate individual project reports into an annual program report beginning in fall 2003 to provide an overview of overall program progress.

The Department agrees with the desirability of having performance targets at the program level where feasible, but it feels the lack of such targets has not had a detrimental impact on the Department's ability to assess the progress of MOST against its stated objectives. It believes that the current reporting requirements and assessment of results are appropriate and effectively inform the Department on how well the program is functioning.

In seeking to extend MOST beyond its expiration (31 March 2007), Transport Canada will introduce practical and feasible program-level performance targets that are consistent with the overall purpose of the program. A key challenge will be to ensure that such targets reflect the program's multiple objectives and do not result in a reduction in the diversity of program submissions. The impact of program-level targets on the integrity of the selection process will also have to be considered.

If the program is extended beyond 2007, Transport Canada will introduce program-level targets in the context of the Treasury Board submission by 31 March 2007.

2.60 The Intelligent Transportation's Systems (ITS) Plan identifies eight objectives, one of which is "reduce energy and environmental costs associated with ground transportation." It also identifies various means to meet this objective, including decreasing fuel consumption and harmful emissions by improving traffic flow. The ITS Applicant's Guide for the deployment and integration component of the Plan also identifies six specific objectives that can be linked to the Plan objectives, one of which is to "reduce environmental impacts, including air emissions, and increase the use of alternative transportation modes." The six projects we examined identified the reduction of air emissions as a project benefit associated with an environmental objective within the project proposal.

2.61 Transport Canada signed a standard contribution agreement with each of the six project proponents for deployment and integration of ITS. In addition to the provisions of the standard agreement, the project contribution agreement incorporates the project proposal by reference and thereby the environmental project objective to be advanced. We would have expected to see concrete performance expectations related to environmental impacts for these projects, including the benefits of reducing air emissions. However, there were no such expectations. Therefore, we are concerned that the Department may not be able to demonstrate the contribution of each project to the environmental objective of the ITS Plan.

2.62 **Recommendation.** Given that one of the objectives of the deployment and integration component of the Intelligent Transportation Systems (ITS) initiative is to reduce environmental impacts, including air emissions, and increase the use of alternative transportation modes, Transport Canada should ensure that, where applicable, the ITS projects it supports have clear and concrete environmental performance expectations.

Transport Canada's response. Transport Canada accepts the recommendation with qualification.

Provision for the measurement of emissions reduction should be contained in those project proposals that have the reduction of fuel emissions as a stated objective. However, it is the Department's view that, due to the newness of ITS technologies and the variability of the applications, there is not yet sufficiently precise knowledge of the relationship between ITS deployments and their environmental impacts to require project proposals to specify an exact quantum as a target for emissions reduction.

Transport Canada is drawing on expert advice to review the six projects examined in order to find ways—either direct or indirect—to measure emissions reductions. In addition, the Department is developing guidelines for the development of fuel emissions reduction measures for use by proponents in future calls for proposals for ITS deployments.

These actions are expected to be completed by the end of December 2003.

2.63 Although the Canadian Transportation Fuel Cell Alliance (CTFCA) program sets out clear and concrete performance expectations, we are concerned about whether the program's activities can be completed and its expected outcomes met by its target dates. For example, the CTFCA program expects to have five vehicle fuelling facilities built by March 2005 and to have data available on their operation by March 2006. However, the CTFCA program is dependent on other sources of funding for the purchase of fuel cell vehicles. Currently, the CTFCA program will have only five fuel cell vehicles and one fuel cell bus available for demonstration purposes. Departmental officials acknowledge that more vehicles will be required to fully demonstrate the planned fuelling stations.

2.64 We noted that the 2001–2002 CTFCA Annual Report identified the lack of availability of fuel cell vehicles as an issue for the fuelling demonstration working groups dealing with light- and heavy-duty vehicles. Our case study below highlights this issue and other industry sector challenges that may also inhibit the achievement of expected outcomes.

The future for fuel cell technology and hydrogen in Canada

Government and industry believe that the widespread use of fuel cell technology and hydrogen are promising solutions to reduce emissions from road transportation. Although there are many potential social, environmental, and economic benefits, significant challenges remain.

Potential benefits

The anticipated social benefits associated with the use of hydrogen fuel cells in transportation are primarily improvements to human health through reduced urban air pollution (smog), since emissions from hydrogen fuel cell vehicles—heat and water—are environmentally benign. Fuel cell vehicles could also help address climate change and other environmental issues, such as reducing groundwater contamination and urban noise pollution. In addition, hydrogen fuel cell technology could represent an economic opportunity for Canada by enhancing the overall competitiveness of our economy and by providing new opportunities for other key industry sectors, a platform for growth in high-value exports, and significant growth in knowledge-based jobs.

Important consideration—The source of hydrogen

Although emissions from hydrogen fuel cell vehicles are environmentally benign, greenhouse gases and other pollutants associated with the production of hydrogen can vary significantly. Key determining factors are the technology used to produce hydrogen and the primary source of fuel used to produce the hydrogen. Hydrogen can be produced from non-renewable sources of energy such as methanol or natural gas (carbon-based fuels) and nuclear power, or from renewable sources of energy such as water, wind, and the sun. The federal government recognizes that the key to the "hydrogen economy" will be the development of clean, efficient energy sources to produce hydrogen.

Challenges

Canada's fuel cell industry has identified a number of significant challenges. These include the following:

- developing infrastructure for fuelling hydrogen vehicles;
- developing uniform industry codes and standards to govern product quality, safety, and component specifications;

The future for fuel cell technology and hydrogen in Canada (continued)

- lowering production costs of fuel cells to be cost-competitive with conventional power sources;
- securing long-term financing to conduct the research and development needed to resolve technical issues and undertake demonstration projects; and
- demonstrating, for the purposes of investment, the economic, environmental, and social benefits of fuel cells.

The "catch 22" problem—An unresolved issue in Canada

Beyond these specific challenges, a more fundamental issue is the "catch 22" problem. A large number of fuel cell vehicles require a supportive infrastructure. However, justifying substantial expenditures on building such an infrastructure may be difficult unless there are a significant number of fuel cell vehicles on the road. The private sector may be discouraged from investing in the required infrastructure until the nature and timing of the demand is better known.

This problem is an unresolved issue in Canada. The Canadian Transportation Fuel Cell Alliance program supports demonstration projects for hydrogen fuelling infrastructure; however, there are no comparable programs addressing the availability of fuel cell vehicles.

Governments have played a role in supporting the fuel cell industry

Federal, provincial, and municipal governments nurtured the Canadian fuel cell industry through its early stages and have played a role in the industry's success to date. From 1982–2002, government support to the Canadian fuel cell industry totalled about $179 million in grants, contributions, and loans. Up to 1999, the federal government alone invested or committed over $100 million, mainly in support of research and development for fuel cells and fuel cell systems in Canada.

Canada is currently among the global leaders

Canada has achieved a reputation as a world leader in hydrogen fuel cell technology. Other countries and regions, such as the European Union, Japan, and the United States, are also implementing policies and programs promoting the accelerated commercial use of these technologies. They too have emerged as leading developers of fuel cell technology. A study conducted for the fuel cell industry suggests that if Canada's rate of innovation can be sustained, Canadian companies will be in a strong position to secure a share of the growing market for fuel cells.

A federal commitment to innovation

In February 2002, the federal government launched Canada's Innovation Strategy, with the overall objective of moving Canada to the front ranks of the world's most innovative countries. One of the strategy's stated priorities is federal investment in infrastructure, research, and multi-stakeholder partnerships to realize Canada's potential to be globally competitive in fuel cell technology.

The federal government is considering a national strategy

A joint government-industry publication, the Canadian Fuel Cell Commercialization Roadmap, identified the need for a comprehensive national strategy for hydrogen fuel cells that focusses on maintaining Canada's competitiveness in the face of growing global competition. Federal officials informed us that the federal government is considering such a strategy, but no firm commitment has been made.

A federal leadership role

While fuel cell technology and hydrogen have many potential benefits, significant challenges remain. The federal government has yet to decide on what leadership role it is going to play in addressing these challenges and, if appropriate, what long-term commitments are necessary.

Intelligent Transportation Systems projects lack provision for credible reporting on environmental impacts

2.65 Both the Moving On Sustainable Transportation program and the Canadian Transportation Fuel Cell Alliance program have appropriate provisions in place for credible reporting. They specify what information is to be reported, by whom, and when, and how information is to be collected, verified, and analyzed.

2.66 Although the contribution agreements for the six urban Intelligent Transportation Systems (ITS) projects define detailed reporting requirements, we noted that there is no provision for credible reporting on environmental impacts. A Transport Canada document for the Strategic Highway Infrastructure Program (SHIP) stated that Transport Canada should collect and maintain data on the environmental impacts of SHIP. These impacts include the reduction of greenhouse gas emissions. However, the reporting requirements of the standard contribution agreement do not make explicit provision for reporting on how well environmental objectives have been achieved. This has created a shortcoming between the environmental performance objective of the ITS Plan and those of the ITS projects. As a consequence, Transport Canada may find it difficult to measure progress against the environmental objective of the ITS Plan.

2.67 **Recommendation.** Given that one of the objectives of the deployment and integration component of the Intelligent Transportation Systems (ITS) initiative is to reduce environmental impacts, including air emissions, and increase the use of alternative transportation modes, Transport Canada should ensure that, where applicable, the contribution agreements for its ITS initiative include a clear provision that requires reporting on this objective.

Transport Canada's response. Transport Canada accepts the recommendation.

Although the standard contribution agreement template does require reporting on the achievement of project objectives, it does not make explicit provision for reporting, where applicable, on how environmental objectives were measured and on how well they have been achieved. Accordingly, the applicant's guide for ITS deployments will be modified to require, where applicable, such detail in the reporting on the achievement of the environmental objective.

This action is expected to be completed by the end of December 2003.

Appropriate provision for reasonable review and adjustment has been made

2.68 Appropriate provision for reasonable review and adjustment had been made for all three programs that we examined. We examined documents and conducted interviews with program managers to identify processes for review and, where necessary, adjustment of program operations. This included specifying by whom, how, and when performance will be reviewed and analyzed relative to program expectations. For example, an internal audit of the ITS Plan is scheduled for 2003. A comprehensive program evaluation of

the Strategic Highway Infrastructure Program, including the ITS component, is required to be undertaken in 2005.

Giving an account through credible reporting and being held to account through reasonable review and adjustment

2.69 Although the Moving On Sustainable Transportation (MOST) program has completed four years of operation, program staff have not yet prepared an annual roll-up report of project outcomes, as required by the program's accountability framework. The lack of clear and concrete performance expectations makes it difficult to roll up project results into program results to get an overall picture of what the MOST program has achieved. Departmental officials informed us that they have recently developed a framework for the annual roll-up of project results for phase 2 of the program.

2.70 Overall, the MOST program has undergone reasonable review and adjustment. Project results are reviewed by MOST staff, and program changes have been implemented between phases 1 and 2. Transport Canada completed a program evaluation in June 2001 and an internal audit of the program in November 2002. We found that both the program evaluation and internal audit reports were of sufficient quality to address issues related to the management of the MOST program, given its size and, in the case of the evaluation, its short period of operation. The Department prepared an action plan in August 2001 to address recommendations of the evaluation, while the internal audit report included an action plan to address its recommendations. We noted that both action plans lacked time frames for completing the commitments, although many of the commitments in the action plan for the program evaluation are already completed. We would expect Transport Canada to establish target dates for completing all the remaining commitments made in these action plans.

2.71 One of the remaining commitments in the action plan for the evaluation of the MOST program was to update Transport Canada's Web site to include a section on individual project results. This section was to highlight lessons learned and provide links to online tools and contact names for those interested in more information. The MOST program is now in its sixth round of funding in four years; however, at the time of our audit, the Department had not updated its Web site to include project results from the MOST program. Given that one of the stated objectives of the MOST program is to provide Canadians with practical information and tools for better applying sustainable transportation thinking in their lives, we would expect project results to be made available in a timely manner.

2.72 The six Intelligent Transportation Systems projects that we examined and the two demonstration projects under the Canadian Transportation Fuel Cell Alliance program had not progressed sufficiently to assess them fully. Thus, we were unable to assess the extent to which they are giving an account through credible reporting and being held to account through reasonable review and adjustment. However, we would expect that as these projects and their funding programs progress, departmental officials would

ensure that credible reporting and reasonable review and adjustment take place. Credible reporting is particularly important for determining the overall success of these programs—including their contribution to reducing Canada's greenhouse gas emissions.

2.73 **Summary of accountability results.** Exhibit 2.3 summarizes the results of our examination of the accountability framework and our assessment of whether accountability is actually occurring (giving an account and holding to account) for the three federal programs described earlier.

Exhibit 2.3 **Summary of accountability results for three federal programs examined**

Accountability framework	MOST	ITS	CTFCA
Provision for clear roles and responsibilities	●	●	●
Provision for clear performance expectations	◒	◒	◒
Provision for credible reporting	●	◒	●
Provision for reasonable review and adjustment	●	●	●

Giving an account and holding to account	Most	ITS	CTFCA
Actual credible reporting	◒	○	○
Actual reasonable review and adjustment	●	○	○

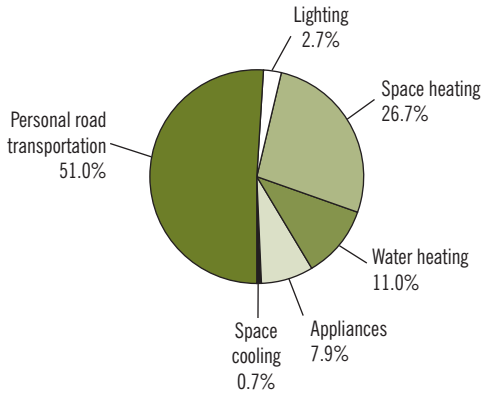
● Appropriate ◒ Improvement required ○ Unable to assess since the program had not progressed sufficiently

MOST – Moving On Sustainable Transportation (Transport Canada)
ITS – Intelligent Transportation Systems (Transport Canada)
CTFCA – Canadian Transportation Fuel Cell Alliance (Natural Resources Canada)

Changing people's transportation behaviour

2.74 Individual Canadians generate about a quarter of Canada's greenhouse gas emissions; about half of their emissions are from personal road transportation (Exhibit 2.4). Vehicles also produce about half the air pollutants, including particulate matter and ground-level ozone, which contribute to smog. In its Climate Change Plan for Canada, the government is calling on all Canadians to reduce their individual greenhouse gas emissions by about 20 percent, or one tonne, from the approximately five tonnes each produces annually.

Exhibit 2.4 Sources of personal greenhouse gas emissions in Canada, 2001



Source: Natural Resources Canada

2.75 Initiatives focussed on changing people's transportation behaviour, in conjunction with technological solutions, are an integral part of the federal government's strategy to reduce greenhouse gas emissions and to achieve sustainable transportation. This strategy involves promoting concrete actions that individuals can take to reduce the adverse impacts of transportation and improve quality of life. Our case study below looks at some promising practices that provide Canadians with information on how they can contribute to reducing transportation emissions. The case study also highlights factors viewed by both departmental officials and project proponents as contributing to the success of such initiatives.

Changing people's transportation behaviour—Promising practices

The transportation behaviour of individual Canadians can have a significant impact on the environment. For example, using a vehicle instead of more sustainable or environmentally friendly transportation options (such as walking, bicycling, or public transit) and idling a vehicle add emissions to our atmosphere. This in turn deteriorates air quality and contributes to climate change and smog. Canadians' individual choices about the vehicles they drive and when they use them can make a substantial difference in transportation emissions.

We looked at three initiatives that received federal funding and whose focus was on changing people's transportation behaviour, namely the Active and Safe Routes to School Program, the Off Ramp—Secondary School Vehicle Trip Reduction Program, and the Turn it Off—Reducing Vehicle Engine Idling pilot project (see Appendix B for a more detailed overview of these initiatives). Environment Canada provided funding to all three initiatives through the Public Education and Outreach component of the Climate Change Action Fund, and Health Canada contributed funding to the Active and Safe Routes to School Program through its Physical Activity Unit. These initiatives were delivered by non-governmental organizations.

Active and Safe Routes to School (A&SRTS)

The A&SRTS program is a national program that encourages the use of active modes of transportation, such as walking and cycling to and from school. Active transportation can help to reduce the number of daily vehicle trips, thereby reducing the amount of emissions released into the atmosphere and improving the health of Canadians through increased physical activity.

In 2002, the proponent for this project estimated that over 250,000 students from 1,432 out of about 12,000 elementary schools in Canada participated in the International Walk to School Day, a component of the A&SRTS program.

Changing people's transportation behaviour—Promising practices (continued)

Off Ramp

The Off Ramp program, which was piloted in several Greater Vancouver and Victoria area secondary schools, provided a long-term focus for developing strategies to get students to walk, cycle, skateboard, in-line skate, take public transit, and carpool to school. To raise awareness of transportation issues, the program hosted school events that offered opportunities and incentives to try transportation alternatives to the personal vehicle, and it worked to overcome barriers to adopting transportation behaviour that is more sustainable. This program promoted its message to over 12,000 secondary students and teachers.

In 2000, the Off Ramp program received an award from the Organization for Economic Cooperation and Development (OECD) for best practice in Environmentally Sustainable Transport, Education and Youth Category.

Turn it Off

The Turn it Off pilot project sought to encourage motorists to avoid idling their engines while waiting in their vehicles at pick-up and drop-off sites at Toronto schools and at Toronto Transit Commission terminals. Overall, this pilot project reduced the incidence of engine idling by 32 percent and the duration of idling by 73 percent.

Natural Resources Canada (NRCan) has been implementing a national anti-idling program and has developed an Idle-Free Zone Web site (http://oee.nrcan.gc.ca/idling/). This Web site provides municipalities with information and tools they can use to take action in reducing vehicle idling at the local level. The NRCan program and the Turn it Off pilot project have many features in common. Anti-idling pilot projects have also been conducted in Mississauga and Sudbury.

Source: picture taken by Office of the Auditor General

Factors viewed as contributing to the success of such initiatives

Departmental officials and project proponents identified a number of factors that contribute to the success of initiatives focussed on changing people's behaviour:

- forming community-based partnerships, since the involvement of other organizations can help secure financial and in-kind contributions as well as promote the initiative;
- securing various sources of funding, including from the federal government, in part because it increases the credibility of the initiative;
- ensuring that the design of the initiative provides for flexibility to allow adaptation to unanticipated obstacles and challenges;
- using incentives and tools such as community-based social marketing, since awareness and information campaigns may not be very effective on their own;
- finding project co-ordinators to assist in the delivery of the project where multiple locations are involved; and
- identifying and overcoming infrastructure and social barriers to active transportation. For example, people may not want to ride their bicycles if the roads do not have designated lanes.

Importance of multi-year funding

Multi-year funding is particularly important since it generally takes some time to achieve habitual and permanent change in people's behaviour. A national program proponent indicated that it is sometimes preferable to have funding spread out over several years so that organizations can better plan for the medium and long term. It may also be easier for organizations to find other funding partners if longer-term funding is secured.

A call for more federal promotion of successful initiatives

When asked about the role of the federal government in initiatives focussed on changing people's transportation behaviour, key players indicated that, in addition to providing financial support, the government could do more to promote these types of initiatives. For example, project information is not always available on the federal government Web site(s). In cases where an organization lacks the resources to maintain its own Web site, it relies on the federal government to help communicate successful approaches, tools, and results.

Promotion of initiatives can, in turn, further assist with replication. A good measure of the success and sustainability of an initiative is whether or not it has been replicated. The three initiatives that we examined have been replicated, or replication is in the planning stages.

Did you know?

- Number of seconds of idling your vehicle that uses more fuel than turning off your engine and restarting it: **10**
- Number of litres of gas used in a year, on average, by idling a vehicle for 10 minutes a day: **100**
- Annual cost of idling for 10 minutes a day, at 70 cents a litre: **$70.00**

2.76 In improving public awareness of sustainable transportation, the ultimate goal of the initiatives in our case study and of the Moving On Sustainable Transportation program is behaviour change. When individuals understand the effects of their transportation behaviour, they can in turn make choices that reduce the need for resources and minimize the adverse impacts of transportation. Part of the solution involves building demand for sustainable transportation choices, making sustainable forms of transportation more attractive to Canadians, and reducing the adverse impacts of vehicle use.

Conclusion

Some accountability provisions need to be improved

2.77 The transportation sector, in particular road transportation, is a major source of Canada's greenhouse gas emissions, and the federal government expects this sector to assume its share of responsibility for meeting Canada's Kyoto target. All of the federal government's actions under Action Plan 2000 and the Climate Change Plan for Canada to reduce greenhouse gas emissions in the transportation sector involve partnering with other levels of government or other stakeholders. Therefore, it is critical that the federal government develop partnership agreements with a strong accountability framework, and that all partners, including the federal government, be held to account for achieving their stated performance expectations.

2.78 In general, reasonable accountability frameworks are in place for the three programs we examined—Transport Canada's Moving On Sustainable Transportation (MOST) program and its Intelligent Transportation Systems (ITS) initiative, and Natural Resources Canada's Canadian Transportation Fuel Cells Alliance program. However, we found some shortcomings that may inhibit the achievement of performance expectations. Provision for credible reporting on environmental impacts is also lacking for the ITS projects examined. In addition, for the MOST program, we are concerned that program staff have not yet prepared a report on the roll-up of project outcomes into overall program results, although a framework for doing so has been developed for phase 2 of the program.

2.79 These concerns, if not corrected, will make it difficult for the federal government to determine the overall success of these programs—that is, to assess the contribution they are making to their stated outcomes, including reducing Canada's greenhouse gas emissions.

2.80 The Intelligent Transportation Systems initiative and the Canadian Transportation Fuel Cell Alliance program had not progressed sufficiently to enable us to assess the extent to which accountability was actually occurring in these programs.

2.81 Now that Canada has ratified the Kyoto Protocol, it is expected that the federal government will continue to move forward with its initiatives in the transportation area to address the climate change challenge. As it does so,

it will be imperative that the government know the extent to which its initiatives are contributing to its overall objective of reducing Canada's greenhouse gas emissions and to meeting Canada's climate change commitments.

About the Audit

Objectives

The overall audit objectives were to determine whether

- appropriate accountability frameworks are in place for federal programs associated with road transportation in urban areas and for the resulting partnerships that are derived from them, and
- accountability is occurring for the programs covered by the audit.

The detailed objectives were to determine

- whether there is provision for clear roles and responsibilities,
- whether there is provision for clear performance expectations,
- to what extent provision is made for credible reporting,
- to what extent provision is made for reasonable review and adjustment,
- whether there is credible reporting, and
- whether there is reasonable review and adjustment.

Scope and approach

Our audit focussed mainly on two key departments responsible for implementing programs and initiatives that have impacts on road transportation in urban areas, namely, Transport Canada and Natural Resources Canada. The audit also examined the involvement of Environment Canada and Health Canada in connection with our case study on changing people's transportation behaviour to reduce their impact on the environment.

We reviewed Transport Canada's Moving On Sustainable Transportation (MOST) program, including the MOST component of the Department's sustainable development strategy. We also examined the deployment and integration component of Transport Canada's Intelligent Transportation Systems (ITS) initiative. In Natural Resources Canada, we examined the Canadian Transportation Fuel Cell Alliance (CFTCA) program.

We carried out two case studies that addressed challenges to developing hydrogen fuel cell technology in Canada and to changing people's transportation behaviour. For the latter case study, we examined three initiatives: the Active and Safe Routes to School Program, the Off Ramp—Secondary School Vehicle Trip Reduction Program, and the Turn it Off—Reducing Vehicle Engine Idling pilot project.

In carrying out our audit, we interviewed departmental officials and other key stakeholders; we reviewed departmental files as well as project reports and other documentation, including relevant orders-in-council, program terms and conditions, and contribution agreements; and we analyzed data. In addition, we carried out site visits in the Toronto area, related to ITS deployment projects, and in the Vancouver area, mainly in connection with our case study on hydrogen fuel cells. We did not undertake a grants and contribution audit of the programs examined herein. For example, we did not look at whether the programs comply with the *Financial Administration Act* and the Treasury Board policy on transfer payments; nor did we look at project monitoring.

Some quantitative information is this chapter is based on data drawn from various federal and other sources indicated in the text. We are satisfied with the reasonableness of the data, given their use in our chapter. However, the data have not been audited, unless otherwise indicated in the chapter. Environment Canada prepares Canada's official national greenhouse gas inventory. The greenhouse gas emissions data it produces are estimates only but are prepared using international guidelines.

Scope limitations. This audit did not include a review of air, marine, and rail transportation modes; nor did it include inter-city public transit or the movement of freight. We also excluded initiatives internal to federal government operations, such as those related to the management of federal vehicle fleets.

Criteria

Given our audit objectives' focus on accountability, our audit criteria were taken from the Office of the Auditor General's December 2002 Report, Chapter 9—Modernizing Accountability in the Public Sector.

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Appendix A Actions within the transportation sector in the Government of Canada Action Plan 2000 on Climate Change and in the Climate Change Plan for Canada

Actions underway or proposed	Lead department(s)	Funds ($ millions)	Expected reductions in greenhouse gas emissions by 2010 (megatonnes)	Means by which the federal government expects to achieve this action
Action Plan 2000 on Climate Change				
• Development and demonstration by the Canadian Transportation Fuel Cell Alliance of refuelling technologies and infrastructure for commercialization of fuel cell vehicles	Natural Resources Canada	$23	0.09	Through government and industry actions
• Negotiations for 25 percent improvement in the fuel efficiency for new vehicles by 2010	Natural Resources Canada and Transport Canada	$16	5.2	Negotiation with automotive manufacturers
• Increased ethanol production to support introduction of ethanol blending in 25 percent of gasoline supply, also known as the Future Fuels Initiative	Natural Resources Canada and Agriculture and Agri-food Canada	$3	0.8	Building on the current federal and provincial excise tax exemptions on the ethanol portion of gasoline, and federal funding for research and development (R&D) and for the use of ethanol in the federal fleet
• Demonstration of integrated strategies, technologies, and planning to reduce urban transportation emissions by the Urban Transportation Showcase Program	Transport Canada	$40	0.8	Through all levels of government, as well as private-sector and non-governmental initiatives
• Negotiation of voluntary agreements with air, rail, truck, and marine sectors to improve fuel efficiency of goods transport	Transport Canada and Natural Resources Canada	$14	2.0	Federal government working with the provinces, territories, and industry to negotiate voluntary performance agreements
Action Plan 2000 total		**$96**	**8.9**	

Actions underway or proposed	Lead department(s)	Funds ($ millions)	Expected reductions in greenhouse gas emissions by 2010 (megatonnes)	Means by which the federal government expects to achieve this action
Climate Change Plan for Canada				
• Consumer action to improve vehicle efficiency, including off-road vehicles	Not specified in the Climate Change Plan—assumed to be Natural Resources Canada		0.8	Federal government enhancing public information programs
• Increasing the target for ethanol blending to 35 percent of gasoline supply, and setting a target of 500 million litres of biodiesel in use by 2010	Not specified in the Climate Change Plan—assumed to be Natural Resources Canada and Agriculture and Agri-food Canada		2.0	Federal government working with provinces, territories, and stakeholders using a variety of tools such as incentives, standards, and R&D
• Increased use of public transit, alternative approaches to passenger transportation, and sustainable urban planning	Not specified in the Climate Change Plan—assumed to be Transport Canada		7.0	Federal government in conjunction with certain municipal efforts and provincial and territorial actions
• More efficient transport of goods, including intermodal transportation	Not specified in the Climate Change Plan—assumed to be Transport Canada		2.3	Public-private collaboration, including negotiations with associations and industry
Climate Change Plan total		**?**	**12.1**	
Total transportation sector		**$96+**	**21.0**	

Appendix B Overview of selected initiatives for changing people's transportation behaviour

	Active and Safe Routes to School Program	Off Ramp	Turn it Off
Start/end dates	• National program launched in September 1998 • Ongoing program	• Pilot program: March 1999 to March 2001 • Extension: November 2001 to March 2002	• 1 October 1999 to 31 August 2000
Proponent	• Go for Green	• Better Environmentally Sound Transportation	• Lura Consulting
Target audience	• Elementary students • Parents and caregivers • Teachers, school administrators, school boards, and parent councils • Various community groups • Municipal planners and elected officials	• Primary: secondary school students • Secondary: teachers, parents, and the community at large	• Motorists at common passenger pickup points (schools and transit terminal parking lots)
Area covered	• National	• Greater Vancouver and Victoria	• Toronto
Objectives	• To encourage walking, cycling, or other non-motorized modes of transportation as an alternative to vehicle use and thereby improve local air quality • To promote active transportation as part of sustainable transportation initiatives and as a key part of a sustainable lifestyle • To increase the physical activity levels of children/youth • To promote safer and accessible routes for children to walk and cycle to and from school • To increase a sense of community for children	• To develop engaging events offering incentive and opportunity for teens to try walking, cycling, taking transit, and carpooling • To support change in behaviour toward sustainable transportation through infrastructure improvements in secondary schools • To reduce car trips in participating schools by at least 20 percent • To raise awareness of transportation issues, climate change, and air pollution	• To decrease the frequency and duration of motorists idling their vehicle engines
Intended environmental benefits	• Improved air quality and a cleaner environment • Less traffic congestion around schools	• Increased awareness about the impacts of motor vehicles on air quality, health, environment, land use, stress, and quality of life, leading to reduced traffic congestion, air pollution, and greenhouse gas emissions	• Reduction in greenhouse gas emissions • Decrease in effects of climate change • Reduction in smog emissions • Improved air quality

	Active and Safe Routes to School Program	Off Ramp	Turn it Off
Other intended co-benefits	• Increased physical activity for children and youth • Healthier lifestyle for the whole family • Safer, calmer streets and neighbourhoods	• Improved personal health through fitness, road and cycling safety, and better air quality • Improved social health through decrease in the costs of car ownership, in sprawl, and in land lost to parking lots	• Protection of human health • Energy savings • Cost savings
Amount of federal funding	• From December 1998 to March 2001 CCAF[1]: $330,000 Health Canada: $280,000	• From March 1999 to March 2001 Pilot program (CCAF): $98,200 • From November 2001 to March 2002 Extension (MOST[2]): $35,000	• From October 1999 to August 2000 CCAF: $53,500
Other funding, including in-kind contributions	• From December 1998 to March 2001 $4,122,100	• From March 1999 to March 2001 Pilot program: $79,000 • From November 2001 to March 2002 Extension: $44,400	• From October 1999 to August 2000 $32,000
Community participation	• By April 2000, over 1,500 schools were officially registered for some aspect of the A&SRTS program.	Pilot program: • Program co-ordinators made 134 site visits to 13 pilot schools • Program co-ordinators interacted extensively with over 50 student leaders and 15 lead teachers Extension: • Created partnerships with three municipalities	• Partners included the City of Toronto (Works and Emergency Services, Health Department), Toronto District School Board, Toronto Catholic School Board, and the Toronto Transit Commission.

	Active and Safe Routes to School Program	Off Ramp	Turn it Off
Examples of results achieved	• 1998: Go for Green launched the national A&SRTS program and Canada's first national Walk a Child to School Day in which an estimated 16,000 elementary students participated. • 1998: Go for Green made a Response kit available to all interested schools. The kit includes a video, success stories, fact sheets, how-to checklists, and a classroom support tool called "Blazing Trails throughout the Urban Jungle." This tool helps students in grades 3 to 6 get to know their neighbourhood better and map safe routes to their school.	Pilot program results: • Program manual (Off Ramp workbook that provides various details on reducing vehicle trips to secondary schools) • Templates and a starter-kit of program activities and ideas • 9 percent reduction in car trips to participating schools Extension: • Five Off Ramp clubs created • Program Co-ordinator Guidebook produced • Four types of promotional materials produced	• At school sites, the combination of anti-idling signs and motorists' use of a no-idling vehicle window stickers reduced the number of vehicles idling by 51 percent and the duration of idling by 72 percent (relative to the control sites). • At transit sites, the combination of signs and commitment reduced the number of vehicles idling by 27 percent and the duration of idling by 78 percent (relative to the control sites).

1. Climate Change Action Fund
2. Moving On Sustainable Transportation

Report of the Commissioner of the Environment and Sustainable Development to the House of Commons—2003

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