

HUMAN SETTLEMENT COUNTRY PROFILE*

CANADA

Decision-Making

Programmes and Projects

- A. Providing Adequate Shelter for All
- B. Improving Human Settlement Management
- C. Promoting Sustainable Land-Use Planning and Management
- D. Promoting the Integrated Provision of Environmental Infrastructure: water, sanitation, drainage and solid waste management
- E. Promoting Sustainable Energy and Transport Systems in Human Settlements
- F. Promoting Human Settlement Planning and Management in Disaster-Prone Areas
- G. Promoting Sustainable Construction Activities
- H. Promoting Human Resource Development and Capacity-Building for Human Settlement Development

Status

Capacity-Building, Education, Training and Awareness-Raising

Information

Research and Technologies

Financing

Cooperation

* This document is based on information submitted and reviewed by the Government of Canada.

Decision-Making: Government and civil society have both played a major role in the development of human settlements and the provision of housing in Canada. The Government of Canada, through its departments and agencies, promotes the development of sustainable communities. Many sustainable community initiatives focus on social inclusion. Re-valuing of sustainable governance practices ensures civil society participation to the planning of human settlements in different cities and provinces.

The federal housing agency, Canada Mortgage and Housing Corporation (CMHC) is empowered to introduce housing policy and programs in areas such as mortgage loan insurance, assisted housing, and research that improves housing quality and affordability. The thirteen provincial and territorial governments are responsible for the regulation of urban and rural development through planning legislation, the regulation of building and housing standards and building and health codes. Municipal governments have considerable regulatory powers related to land use zoning, land and housing development, transportation and infrastructure services.

Land-management: With the exception of federally controlled lands, provincial governments exercise constitutional authority over land use laws and policies. Provinces delegate much of their authority to municipalities, which often set local land use rules and priorities. Aboriginal peoples are also involved in decision-making activities on land management, especially in the north. Their resource management efforts draw on their traditional ecological knowledge, non-Aboriginal knowledge, and information technology.

Energy: Under Canada's constitution, jurisdiction over energy is divided between the federal governments and those of provinces and territories. Energy regulatory policy strives to meet the constitutional division of powers and objectives of 14 jurisdictions. There are also efforts to incorporate the views of all stakeholders in energy issues, including the nine groups identified in *Agenda 21*. Public participation is encouraged at all levels of decision making, from legislative committees to regulatory and judicial hearings and environmental assessment processes.

Transportation: Companies involved in transportation production and distribution are represented by organizations that maintain relations with the federal and provincial/territorial governments. Decision-making also involves consultation with stakeholders and four orders of government: municipal/local, regional, provincial/territorial, , and federal. Generally, municipal/local governments and regional governing bodies are responsible for municipal transit, parking fees, and bicycle lanes.

Provinces and territories have authority to set emissions and fuel quality standards comparable to, or exceeding, federal standards. They are also responsible for some aspects of inter-provincial/territorial highway issues. The federal government is largely responsible for international issues, setting emissions and fuel quality standards, and some national and inter-provincial/territorial aspects of rail, bus, and truck transportation.

The main federal legislation governing transportation in Canada is the Canada Transportation Act 1996. A recent review of the Act included assessments of both its overall environmental impact, and government powers to support sustainable development objectives.

Federal and provincial governments have taken initiatives to reduce vehicle emissions. Most recent actions include: vapour pressure limits for gasoline, implementation of new national vehicle emission standards, and federal regulations to reduce sulphur content in diesel fuel and levels of sulphur and benzene in gasoline. New Canada-wide Standards for Particulate Matter and Ozone and other air quality-related Canada wide standards have been adopted, or are in the process of adoption. For further information, consult: <http://www.cmhc.ca>.

Programmes and Projects: Poverty: A recent example of Canada's poverty alleviation efforts, the National Child Benefit provides benefits to low income families with children (http://www.socialunion.gc.ca/ncb_e.html). Specifically addressing poverty in Aboriginal communities, the federal government has prioritized increased investments in health, education, housing and infrastructure.

Climate change: In 2000, the federal government announced Action Plan 2000 on Climate Change as its contribution to the First National Climate Change Business Plan. Action Plan 2000 contains initiatives in the following areas: transportation, energy (oil and gas production and electricity), industry, buildings, forestry and agriculture, international projects and investing in future solutions (technology, as well as science and adaptation). The Aboriginal and Northern Community Action Plan, an initiative under the federal government's action plan has as its objectives: to reduce greenhouse gas emissions and promote more energy efficient use and production practices in these communities, and to provide capacity building and training of key community members so that these practices will be sustainable.

Environmental health: Major initiatives include a national strategy for prevention and control of asthma, a federal tobacco control strategy and the federal initiatives on climate change and clean air.

A. Providing Adequate Shelter for All: Affordable Housing: In 2001 the Government of Canada announced it would help stimulate the creation of more affordable rental housing. Subsequently, the federal, and all provincial and territorial governments agreed on an Affordable Housing Framework to provide \$1.36 billion over five years for an affordable housing program. The federal investment of \$680 million will be matched with at least \$680 million from other sources. There was also agreement to continue work on longer-term affordable housing strategies to improve the overall climate for investment in affordable housing. A further \$320 million were added for affordable housing in 2003 and an extension of the renovation program will be supported by another \$384 million. This is in addition to the \$2.0 billion the federal government spends annually on assisting 640,000 low and moderate-income households.

In 1999, the federal government announced its Homelessness Initiative of \$753-million over three years. This Initiative engages all levels of government and community partners in the development of appropriate responses to priorities identified at the local level, including funding enhancements to existing programs. The National Homelessness Initiative is enhancing existing programs and developing the Supporting Communities Partnership Initiative, allowing communities to plan and implement comprehensive local strategies to reduce and prevent homelessness. SCPI allocates \$405 million over three years, for communities where homelessness is a serious problem. 80 per cent of the funding will go to 10 cities where homelessness is most acute. The goal of SCPI is to provide a flexible means for communities to plan and implement comprehensive local strategies to reduce and prevent homelessness. The homelessness initiatives also includes \$311 million for housing rehabilitation programs. Over time, these responses will assist homeless people to move from the streets and emergency shelters to more secure lives.

. The federal government also tackles homelessness by investing in the Youth Employment Strategy, and the Urban Aboriginal Strategy.

Under the 1996 federal on-reserve housing policy, the number of houses on reserve has increased by 13,549 while the number of houses deemed in adequate condition increased by 12,200.

B. Improving Human Settlement Management: Infrastructure: The federal government has committed a minimum of \$2 billion towards a National Infrastructure Program that will provide funding over six years based on partnerships with provincial/territorial and municipal governments. There are also signed agreements with the Federation of Canadian Municipalities (FCM) to provide \$250 million for the Green

Municipal Enabling Fund and the Green Municipal Investment Fund to provide municipalities with financial resources to invest in best practices and innovative municipal environmental infrastructure projects. Another component of the program is a partnership between the National Research Council of Canada and the Federation of Canadian Municipalities for the development of a National Guide to Sustainable Municipal Infrastructure.

Provincial and territorial governments have taken initiatives to promote more sustainable communities by managing urban growth (such as British Columbia's Growth Strategies Act); improving infrastructure (Saskatchewan); raising community awareness on specific environmental issues (Alberta); managing solid wastes (Nova Scotia, Quebec, Ontario); protecting water quality (Manitoba, Ontario, Quebec); and strengthening community planning (Yukon, Nova Scotia). Municipal governments hold many of the levers to control emissions, including land use planning, public transit and waste management. The Partners for Climate Protection (PCP) program receives funding from the federal government to bring together 90 Canadian municipalities to reduce the local production of GHG emissions and improve quality of life. The PCP offers capacity building through workshops, tools such as inventory and projection software, and data collection support.

The Canadian Rural Partnership (CRP) initiative aims to better equip rural communities to participate in opportunities for sustainable community development.

C. Promoting Sustainable Land-Use Planning and Management: Strategic land use planning in British Columbia involves all levels of government, First Nations and a wide range of stakeholders, including the forest industry, environmental groups and tourism interests. To date, three regional and 15 sub-regional plans covering 73 per cent of the province have been completed. The outcomes of approved strategic land use plans are:

- the resolution of land use issues;
- a range of resource management zones that support investment certainty by defining where resource development can occur and to what extent;
- protected areas that protect the natural diversity of the province and recreational features;
- agricultural land zoning;
- settlement zones for the future needs of local communities; and
- information contributing to forest certification.

D. Promoting the Integrated Provision of Environmental Infrastructure: water, sanitation, drainage and solid waste management: See under Freshwater and Sanitation Profiles.

E. Promoting Sustainable Energy and Transport Systems in Human Settlements: All levels of government have implemented a variety of programs to promote energy efficiency, alternative transportation fuels and renewable energy.

The federal government's Action Plan 2000 on Climate Change contains a commitment to develop and deploy alternative energy in Canada, reducing both greenhouse gases and smog forming pollutants. Key elements include improved energy efficiency and use of alternative transportation fuels and renewable energy sources.

Energy: Canada's energy policies include sustainable development, energy diversification and improving efficiency in production and use.

Transportation: The Moving on Sustainable Transportation program supports projects that produce education, awareness and analytical tools on sustainable transportation. Federal and provincial governments have programs in place to reduce vehicle emissions. Recently, the Federal Government

announced a 10-year agenda for cleaner vehicles, engines and fuels. This agenda includes new vehicle and engine standards for diesel fuel used in trucks, buses and construction and agricultural equipment by 2004.

The Urban Transportation Showcase Program was developed to demonstrate, evaluate and promote effective strategies to reduce greenhouse gas emissions from urban transportation. This program will be delivered in partnership with the provinces and municipalities to promote effective sustainable transportation in Canadian communities.

Many municipalities are already taking action on measures to combat congestion costs and health effects of continued urban traffic growth. Most municipal master plans, particularly for larger urban centres, address traffic demand management in some form, including pedestrian/bicycle infrastructure enhancements, transit improvement and other measures to influence driving behaviour. There are also private sector and NGO initiatives, such as commute trip-reduction programs, active transportation promotion campaigns and car-sharing programs. While these initiatives all yield appreciable benefits, their scope is not broad enough to counter the trend of increasing urban car use.

Through a variety of initiatives, governments in Canada are advancing work on a number of projects, including: the production and use of alternative fuels and alternative fuel vehicles; the promotion of energy-efficient practices; the development of measures that reduce green house gas emissions (GHG); the improvement of fuel quality; and the development of new air quality standards.

The Government of Canada delivers several initiatives to increase the fuel efficiency of motor vehicles and to encourage the use of alternative transportation fuels (ATFs). Opportunities to improve the fuel efficiency of road transport include manufacturing more fuel-efficient vehicles, encouraging private and commercial owners to purchase more fuel-efficient vehicles and promoting more fuel-efficient driving and maintenance practices. As well, there are opportunities for passenger and freight users to employ more energy-efficient modes of transportation.

The Vehicle Efficiency Targets Initiative encourages manufacturers to produce vehicles that meet voluntary average fuel consumption targets for new cars, vans and light-duty trucks. The Personal Vehicle Program is an information program that encourages motorists to buy, drive and maintain their vehicles in ways that reduce fuel consumption, save money and benefit the environment.

The federal government also promotes the development and use of ATFs through its Vehicle Fuels initiative to promote the reduction of GHG emissions in the transportation sector through greater use of energy sources such as natural gas, ethanol, propane and fuel cells. In certain circumstances, financial incentives are provided. Present targets include a four-fold increase in current ethanol production and use by 2010. As well, the Canadian Transportation Fuel Cell Alliance works to develop fuel cell vehicles and fuelling pathways.

Action Plan 2000 also includes a Motor Vehicle Fuel Efficiency Initiative, targeting a significant voluntary improvement in new vehicle fuel efficiency by 2010, as well as a comprehensive public education campaign to promote 'green' driving.

F. Promoting Human Settlement Planning and Management in Disaster-Prone Areas: No information available.

G. Promoting Sustainable Construction Activities: The City of Toronto created the Toronto Atmospheric Fund (TAF) in 1992 with an endowment of \$23 million from the sale of city property to help Toronto meet its goal of reducing GHG emissions by 20 per cent by 2005. TAF has supported a number of innovative projects including the Better Building Partnership and the Clean Air Investment

Fund. The Better Building Partnership is a successful public-private partnership that promotes and implements building renewal and energy efficiency retrofits of industrial, commercial, institutional and multi-residential buildings. TAF is one of the many partners in the project that has implemented retrofits in over 450 buildings. Through this work 3,800 person years of employment were created, \$19 million was saved and carbon dioxide emissions have been reduced by 132,000 tonnes per year (City of Toronto, 2001). In October 2001, TAF has also agreed to fund the Clean Air Investment Trust that will finance energy efficiency initiatives. These energy savings projects will improve air quality, reduce GHG emissions and reduce expenditures on energy.

H. Promoting Human Resource Development and Capacity-Building for Human Settlement Development: See under Capacity-Building, Education, Training and Awareness-Raising.

Status: General: Within Canada, immigration now accounts for about 60 per cent of the country's total population growth. In the present context of low fertility and possible negative natural increase by 2024, immigration becomes the major factor in Canada's population growth. The settlement patterns of immigrants and refugees mean that the impact of population growth in Canada is highly concentrated in the largest urban centres. The number and proportion of the elderly population have been increasing, as people live longer and healthier lives. The population 65 years and over was 12.6 per cent in 2000. By 2050, this segment of the population will account for about 25 per cent of the total Canadian population.

Poverty: Applying a measure of poverty similar to that used by the United Nations (less than one half of median income), 11.5 per cent of the Canadian population lived in poor households in 1999.

This percentage is down from 12.0 per cent in 1996, but up from the all-time low of 10.2 per cent in 1989. The growth in average incomes in the latter part of the 1990s has contributed to a lower incidence of low incomes in Canada. This growth, however, has also coincided with an increase in market income disparity over the period. In 1989, the top 20 per cent of families received 41.9 per cent of total market income; in 1999 this figure stood at 44.4 per cent. At the same time, the share of income going to the 20 per cent of families with the lowest income decreased from 3.8 per cent to 3.5 per cent.

Urban settlements: Canada is a highly urbanized country: 80 per cent of Canadians live and work in urban areas, although since the country is large, there are significant regional variations. As a result of immigration, Canadian cities are also rapidly changing. Canada's largest city, Toronto, is now one of the most multicultural cities in the world. In 2000, Toronto received over 80,000 immigrants from more than 170 countries. Over 100 languages are spoken in Toronto, and by the year 2003, foreign-born residents will comprise more than half of Toronto's population of 2.4 million people.

Immigration reinforces Canadian urbanization trends and compounds housing and other infrastructure challenges in Canada's cities. The issue of increasing urbanization is highly complex. Whereas immigration may contribute to the trend, immigration is neither a cause nor a likely lever for influencing those trends. There are powerful historic, economic, social geographic and cultural forces at work in the background. Solutions will have to address this inherent complexity; attempts to lure immigrants to settle in smaller centers promise no strategic impact on the complex challenges that major urban centers present

Immigration policy is developed with sustainability in mind using concepts such as "absorptive capacity". Sustainability and absorptive capacity operate on several levels: the social will to welcome immigrants and embrace their diversity; availability of appropriate housing; ability of the educational infrastructure to adapt to the influx of students with different needs; flexibility and capacity of the health care system to respond to new health challenges such as those demonstrated by survivors of torture or newcomers with exotic illnesses; willingness of the political system at all government levels to include newcomers; capacity of the labour market to integrate

newcomers, benefit from their diverse skills and general attributes and promote them to their most effective levels; capacity of cultural institutions to embrace new art forms and make them Canadian.

The Australian example of integrating immigration, economic, income support and professional accreditation policies and programs may provide some clues. Canada's realities are more complex than Australia's, however. As a federal state with multiple jurisdictional challenges, it is more difficult to achieve the type of policy coherence and integration that Australia illustrates. The Maytree Foundation has presented a blueprint for such an integrated approach. The Maytree Model presents a daunting challenge for Canada, however. Canada will need to spend a couple of generations in concerted policy and program development involving all levels of government. The sustained will to achieve such an enterprise is Canada's biggest challenge.

Some Canadian projects and initiatives, specifically efforts to guarantee a minimum level of service of entry and getting established in the small urban centres, to help immigrants find a place in the community, are expected to produce results. Lessons from past attempts need to be drawn that can assist the creation of suitable conditions for retaining immigrants in the place of their arrival. This requires that all concerned parties work together toward these goals. This is the current strategy in supporting non-profit and community groups to develop a toolkit for this purpose. However this strategy will work only in the long term and delivers few if any results in the short term.

For the most part, Canadian cities are safe and clean. As Canada's economic engines, accounting for a substantial portion of the country's GDP, they provide the social, economic and physical infrastructure for business to develop, and for workers and families to live in secure and healthy neighborhoods. Health care in urban centres is accessible, diverse, and of high quality. Canadian cities also provide excellent education opportunities as most of Canada's best universities and colleges are in larger urban areas.

Canadian cities, however, also face complex, interrelated challenges that are having adverse effects on quality of life and long-term sustainability. These include urban sprawl, leading to rising energy consumption, greenhouse gas emissions, and the loss of prime agricultural land (more than 10 per cent of Canada's prime agricultural land has already been converted to urban uses); pollution to air, water and land; and related health issues that affect vulnerable populations such as the young, the elderly and the sick. Other interrelated issues confronted by Canadian communities include access to affordable housing, homelessness, income disparity, the downturn of traditional industries, inadequate infrastructure, immigration to urban areas, emigration of rural youth, and a shift in the skills required for a knowledge-based economy.

Over the 1990s, Canada's metropolitan areas continued to grow by spreading into formerly rural areas. Cities within commuting distances of the large urban centres of Toronto, Montreal and Vancouver grew especially quickly. This evolving urban pattern is linked to the changing nature of manufacturing, the growing share of services in the economy and shifting retail patterns. Manufacturing and service industries and retail centres relocate or are newly established in the suburbs and metro-adjacent satellite communities, leading to a new "multinucleated urban form," particularly around Montreal and Toronto.

Air quality is a major concern for large urban centers, particularly those located in the Windsor-to-Quebec corridor, the lower Fraser Valley (in British Columbia) and the southern Atlantic region. In summer, more than half of all Canadians are routinely exposed to ozone levels that are known to have adverse effects on health.

Another source of adverse health effects in general and particularly in urbanized regions is first- and second-hand smoking (SHS). Private dwellings fall outside the scope of any existing Canadian law,

although public education campaigns have targeted the concern that some 800,000 children under the age of 12 are exposed to SHS in their homes.

Canada launched a Tobacco Control Strategy: Along with prevention, cessation and harm reduction, 'protection' is one of the four strategic goals. A major theme of mass media advertising sponsored by the Tobacco Control Program (TCP) is protection from second-hand smoke, estimated to be a causal factor in the deaths of about 1,000 Canadians annually. The Non-smokers' Health Act restricts or eliminates smoking in all federal government and federally regulated workplaces (e.g., banks, inter-provincial transit) and prohibits smoking on passenger aircraft. Smoking in other public places and spaces falls within the jurisdiction of provinces and territories, or may be restricted by way of municipal by-laws. TCP supports the efforts of workplaces and municipalities in becoming smoke-free through the provision of information guides and toolkits addressing smoke-free policies. TCP plans to develop educational material for parents addressing SHS in homes and cars. As of Spring 2003, over 300 Canadian municipalities had non-smoking by-laws. As energy conservation measures in homes and workplaces continue to evolve, the issue of indoor air, including its pollution by tobacco smoke, can be expected to become increasingly critical, given the increased need for ventilation in such buildings.

Rural Canada: Many rural Canadians face rising economic and employment challenges. High transportation costs increase the costs of most goods and services. Fewer traditional jobs in primary resource industries and downsizing, and increased centralization within all levels of government, have reduced the number of suitable employment options. Maintaining adequate services and infrastructure (health, education) becomes more difficult when young people leave rural areas in search of better economic and social opportunities.

Single industry communities that depend on the exploitation of a single natural resource such as forests, minerals, agriculture or fish face particular sustainability challenges. There are approximately 650 such communities in Canada, dependent on the forest industry alone, and many more are dependent on other resource industries. While most may be geographically remote and distant from major population centres, they are intimately tied to the world economy and directly affected by swings in international commodity prices. When the resource upon which these communities depend is depleted, or becomes uneconomic, the social consequences can be profound. Several such communities have lost their economic foundation over the last decade (some mining towns in the North and some fishing communities on the East Coast), causing financial hardship, forcing re-settlement and often the loss of a way of life for the town's former inhabitants.

Land-use: Two key challenges facing land management are the urban sprawl caused by low-density settlements spreading around Canada's urban centres that consume vast quantities of land; and fragile ecosystems that raise a host of land management challenges.

Issues related to land remain the most intractable. The existing historic treaties cover everything from agreements to live in peace and friendship, surrenders of Aboriginal lands, health care and education. Modern treaties generally address land claims and self-government arrangements. Most land claims agreements recognize Aboriginal environmental management regimes, or establish co-management regimes between Aboriginal and non-Aboriginal people.

Energy: Canada is a world leader in the development and use of renewable energy sources. About 18 per cent of energy supply is from these sources, compared to an average of six per cent found in member countries of the International Energy Agency. Most of Canada's success is attributable to hydroelectricity. Data on energy use is published in an annual review of trends and related greenhouse gas emissions. Detailed information is available in Energy in Canada – located at <http://www.nrcan.gc.ca/es/ener2000/>.

Transportation: This pattern of urban sprawl has increased the demand for transportation services and, particularly, the private automobile. In 1992, there were 13.3 million passenger cars in operation in Canada, nearly one car for every two people, the highest rate of car ownership in the world next to the United States. In 2000, the number of cars/light trucks registered for use in Canada had increased to 16.8 million. By contrast, urban transit use remained essentially level during this same period.

Urban sprawl, traffic congestion and the ever-increasing number of cars in Canada are directly connected and all have an impact on human health and the natural environment. In Canada, transportation sources are responsible for 59 per cent of the emissions of smog-causing nitrogen oxides and 27 per cent of volatile organic compounds. Greenhouse gas emissions from transportation sources, primarily cars and light trucks, account for approximately 26 per cent of the Canadian total. It is expected that, with no further policy initiatives, 60 per cent of the projected growth in emissions from 2000 to 2010 will come from two sectors: transportation (31 per cent) and fossil fuel production (29 per cent). Indeed, it will be difficult to find a way to meet Canada's Kyoto target without significant action to reduce emissions from the transportation sector. This sector, counting both passenger and freight, is now the largest source of GHG emissions and is growing more rapidly than any other.

Canada has also had partial success in addressing air pollution from vehicles. While individual North American vehicles emit 97 per cent fewer hydrocarbons, 95 per cent less carbon monoxide and 83 per cent fewer nitrogen oxides compared to 1971, and Canada banned lead additives in gasoline for on-road vehicles in 1990, there are many more cars on the road and most jurisdictions have been slow to follow the lead of British Columbia in requiring reduced emissions from the entire vehicle fleet, including vans, light trucks and sport utility vehicles.

Capacity-Building, Education, Training and Awareness-Raising:

The Canadian Centre for Public-Private Partnerships in Housing (CCPPPH) within CMHC works with organizations and individuals from the non-profit and private sectors who wish to develop housing that is innovative or community-based or affordable. The CCPPPH offers advice, expertise and other tools, including interest-free Proposal Development Fund loans to help housing proponents with upfront expenses of developing their affordable housing project. In addition, the CCPPPH provides Seed Funding and training and can facilitate the financing of affordable housing through CMHC mortgage loan insurance. From 1997 to 2003 the Centre has helped facilitate the development of over 400 housing projects across Canada representing over 25,000 housing units.

A strategy for Aboriginal Capacity Development will involve CMHC in sharing knowledge and experience with Aboriginal groups to develop appropriate technical infrastructure and housing governance capability for running their own systems and for ensuring the sustainability of the final product.

A number of national, regional and local organizations and groups has been established to coordinate research and information transfer activities related to Canadian human settlement and housing efforts including the National Housing Research Committee, the Intergovernmental Committee on Urban and Regional Research, the Technical Research Committee of the Canadian Home Builders' Association, and the Institute for Research in Construction, as well as federal interdepartmental working groups and federal/provincial/territorial committees. Non-governmental organizations such as the Federation of Canadian Municipalities, Canadian Housing and Renewal Association, Cooperative Housing Federation, First Nations and Aboriginal organizations and others, are instrumental in information sharing.

The Aboriginal and Northern Community Action Program under the federal Climate Change Action Plan will work in INAC regions to develop a strategy and delivery program for training and education in community energy use and production for Aboriginal and northern community members.

Citizenship & Immigration Canada (CIC) promotes awareness of sustainable development and environmental issues through many of its publications, such as introductory guides to Canada for potential immigrants, welcome guides for newcomers to Canada and study guides for citizenship-ready residents. Its Citizenship Judges will begin to incorporate awareness of the environment in their speeches at citizenship ceremonies. CIC also aims to educate children and youth about sustainable development through modules and magazines for teachers, which include information on respecting and protecting the environment. CIC authors a youth-oriented website called "Citizine" to inform about Canadian issues, persons and products, a past issue of which showcased the theme of sustainable development, which is still available at www.citizine.ca

Energy: The Climate Change Action Fund allocated \$30 million over its first three years to the Public Education and Outreach Program (www.climatechange.gc.ca). Canadians are educated about the environmental impact of energy use and encouraged to adopt energy-efficient practices and alternative forms of energy. EcoAction 2000 provides financial assistance and advice to non-profit Canadian groups that want to undertake local environmental projects.

Education is a provincial/territorial mandate, with each jurisdiction designing its own curriculum. Science, environment, and geography curricula typically include units on energy, transportation, and climate change. In general, the private sector is the main communicator with teaching institutions regarding training programs.

Transportation: The \$150 million Climate Change Action Fund (CCAF) was established in 1998 by the federal government to help Canada meet its commitments under the *Kyoto Protocol* to reduce GHG emissions. It is intended to support early actions to reduce GHG emissions and to increase understanding of the impact, cost and benefits of implementing the *Protocol*. More than 100 projects are designed to raise public awareness about climate change and to encourage the public to take action. Some 25 per cent of these projects are related to transportation.

Some programs under the CCAF focus on shared transport. For example, the Canada Commuter Challenge encourages Canadians to leave their cars at home when going to work. Programs such as British Columbia's Commuter Connections promote ride sharing to reduce fuel consumption and emissions. Supported by CCAF, Commuter Connections is involved in providing rideshare programs for some 60,000 commuters in the province's most heavily populated areas.

In 2000, Transport Canada launched an internal Green Commute program to promote sustainable commuting behaviour among its employees in the National Capital Region. It is committed to expanding the program to its regional offices, and promoting adoption of the program by other federal departments across Canada. Moving On Sustainable Transportation (MOST) promotes greater awareness and the development of innovative approaches to sustainable transportation. To date, 26 projects have been funded, including Active and Safe Routes to School that encourages active modes of transportation to and from school. Environment Canada organizes voluntary vehicle emissions clinics in cooperation with various regional organizations in both the public and private sector.

Many of the provinces operate clean driving programs. For example, emissions testing and repair has become a mandatory requirement for vehicle registration and transfer of ownership under Ontario's Drive Clean Program. Environment Canada and Transport Canada worked closely with the Canadian Urban Transit Association, Bombardier, and other private sector partners to deliver a major nation-wide

sustainable transportation campaign in 61 Canadian cities. The campaign focused on informing the public about alternatives to single -occupant vehicles and highlighted the role of public transit in creating cleaner and healthier communities.

Information: *Land-use:* A wide range of environmental data and traditional ecological knowledge is collected by Canadian governments, academic institutions, Aboriginal peoples, private sector actors, and conservation groups. Some initiatives are:

The National Soil Data Base as the national archive for land resources information on soil, landscape, and climate. The information is created by land data analysis projects, and collected by federal and provincial field surveys.

- The National Topographic Data Base (Natural Resources Canada) digital data base covering the entire Canadian landmass. It contains the features normally found on topographic maps at the scales of 1:50 000 and 1:250 000.
- The Canadian Earth Observation Network (CEONet) and the National Atlas of Canada facilitate access to national-scale geographic information in digital and conventional maps. The maps reflect the social, economic, environmental, and cultural fabric of Canada.
- The National Land and Water Information Service (NLWIS) is a tool for better management of land and water resources by encouraging responsible environmental choices by those who make the day-to-day decisions on land and water management. This service provides online access to information on soils, landscape, hydrology, land use and other data required by producers, agricultural industry groups, municipalities and governments to manage Canada's land and water resources.
- GGeoConnections facilitates access to national-scale geographic information in digital and conventional maps. The maps reflect the social, economic, environmental and cultural fabric of Canada.

Energy: For more information energy-related legislation, please visit:

http://canada.justice.gc.ca/bireg/index_en.html. For information on programs, publications and data development, please consult: <http://oe.nrcan.gc.ca>. For information on Canada's Climate Change Plan, please visit: <http://www.climatechange.gc.ca>. The National Energy Use Database (NEUD) Initiative Database is at: <http://oe1.nrcan.gc.ca/dpa>. The Sustainable Cities Initiative makes geographical data available to Canadians through the Internet at: <http://www.sustainable.org>.

Transportation: Indicators will be developed by 2003/2004 to assist in making decisions and monitoring progress on sustainable transportation. Work is underway to continue improvement of a network to analyze, develop, improve and disseminate pollutant information inventories. For more information, see: <http://www.ec.gc.ca/pdb/cac/cacdoc/1995e/canada95.htm>

Research and Technology: Through Canada Mortgage and Housing Corporation's (CMHC) Healthy Housing and Sustainable Communities research, Canada develops healthy housing practices that reduce energy-consumption in low-rise and multiunit housing, lessen climate change, protect occupant health by improving the indoor environment and reduce resource use. To encourage sustainable community planning and design, CMHC has published Practices for Sustainable Communities which outlines principles, tools and Canadian case studies for the physical dimension of sustainable community development. With a variety of partners, CMHC is engaged in research into sustainable urban and rural development approaches which consider intensification, brownfield redevelopment and infrastructure support. CMHC is involved in research and information transfer exploring energy efficiency, technical research and building codes and the development, funding and operation of an array of national social and market housing initiatives. (www.cmhc-schl.gc.ca)

More than twenty partners across Canada, including home-builders associations, federal agencies, provincial governments and energy utilities have supported. The R-2000 Program for residential energy efficiency. Manufacturers have developed many unique building products, such as heat recovery ventilators, high performance windows and integrated mechanical heating and cooling systems. (www.chba.ca)

The Canadian Urban Research on the Environment (CURE) project supports information sharing and networking among municipalities to find solutions to urban environmental problems.

Land-use: Technological capacity related to land use planning is improving through initiatives such as the RADARSAT satellite and tracking system. Since completion in 1995, it has been used for such resource and environmental management as flood assessment, conducting mineral exploration, forest monitoring and ice monitoring. Two receiving stations have been built and are operated by natural Resources Canada, one in Quebec and the other in Saskatchewan.

Energy: Canada has identified the need to improve technological capabilities on cleaner fuels, and the application of these capabilities to improve performance. It is working with other countries facing similar challenges. In addition, there are research and development initiatives to improve market penetration and energy efficiency.

Because fossil fuels will continue to contribute significantly to the total global energy mix for the foreseeable future and the demand for these fuels will increase, Canada works on promotion, transfer, research and development, and use of advanced and cleaner fossil fuel technologies.

Research and development in hydroelectricity focuses mainly on small-scale hydroelectric projects with a capacity of 20 megawatts or less. Several different biomass technologies have been developed and demonstrated in Canada.

Work is underway on new coal conversion technologies to increase both the competitiveness and environmental acceptability of coal through increased overall thermal efficiency and reduced emissions. Other areas of clean production include the Microwave Assisted Process™, liquid-phase extraction, gas-phase extraction and chemical synthesis.

Transportation: Governments in Canada are working with the alternative fuel industry and major vehicle manufacturers to expand the use of propane, natural gas, methanol, ethanol, electricity, hydrogen, and fuel cells. Canada developed the world's first hydrogen-powered fuel cell transit bus.

Alternative Transportation Fuels is an initiative to encourage the production and use of alternative fuels and alternative fuel vehicles. It calls for economic and market studies, emissions and safety assessments, information and technology transfers, and assistance to industry to promote cost-effective applications. All major North American car manufacturers now have fuel cell programs. Automakers have indicated they will have limited production fuel-cell cars on the road by 2004. Electric vehicles are also expected to play a role in Canada's transportation energy future. Canadian researchers are developing and testing a range of technologies, including hybrid electric vehicles.

Transportation research is undertaken by a variety of government, non-government, and university groups.

Canada has been a leader in Intelligence Transportation Systems (ITS) development for several years. Some of the first ITS development occurred in Canada, including the world's first computer-controlled traffic signal system in Toronto. Transport ITS systems are yielding environmental benefits while increasing productivity. (See <http://www.its-sti.gc.ca>)

Financing: The Canadian housing finance system is part of the larger national and international capital markets and the federal government supports affordable housing through CMHC's housing finance

activities. CMHC mortgage loan insurance has helped one in three Canadians to access financing to purchase a home. In 2002, some 525,000 housing units were insured bringing total CMHC mortgage loan insurance in force to over \$224 billion. CMHC increases the supply of low cost funds for housing through the National Housing Act Mortgage Backed Securities (MBS) introduced in 1987 and the Canada Mortgage Bond Program (CMB) launched in 2001. In 2002, total annual securities guaranteed exceeded \$20.6 billion, bringing the total guarantees in force to \$45 billion.

In the last two years, the federal government has committed \$250 million to the development of two Green Municipal Funds. Managed by the Federation of Canadian Municipalities (FCM), these complementary funds are intended to encourage investment in innovative municipal projects. By leveraging investments from municipal, provincial and territorial governments, the Green Municipal Funds increase public/private partnerships and also recognize the strong role of municipalities in the promotion of sustainable development. Federal government committed to creating a Strategic Infrastructure Foundation, with a minimum federal commitment of \$2 billion, to fund large strategic projects; and confirmed \$680 million in funding for a capital grants program to alleviate the shortage of affordable housing.

Energy: Low Canadian energy prices have discouraged investments in energy efficiency and explain, in part, Canada's high energy intensity. Over the last decade, the federal government has stopped subsidizing energy "megaprojects." It still provides tax incentives to select renewable and efficiency energy technologies and financial support to the nuclear industry (\$156 million to the nuclear industry in 2000 and \$12 million to renewable energy technologies). The federal government has also recently provided support for renewable energy production, including an incentive for wind power (up to \$260 million over 15 years).

Cooperation: The Canadian International Development Agency funds urban-based development projects undertaken by a range of organizations. Local governments are also involved in international cooperation and the Federation of Canadian Municipalities (FCM) international program, with CIDA funding, has involved over 100 Canadian municipalities in 40 partnerships with local governments in 15 countries in Africa, Southeast Asia and Latin America. The Sustainable Cities Initiative (SCI) led by Industry Canada is a multi-partner public/private initiative to apply Canadian technology and expertise to priority urban sustainability problems in partnership with selected cities around the world. Canada also remains committed to the goals and principles of the Habitat Agenda and the Istanbul Declaration and believes that their successful implementation requires the involvement of government, local authorities, civil society organizations and others.

Canada's International Development Research Centre (IDRC) works towards improving human settlements around the world by supporting research, notably, on urban agriculture. Many governments now recognize the contribution urban farmers make to cleaner, healthier cities. Most, however, lack policies to integrate urban agriculture into sustainable urban management practices. IDRC's Cities Feeding People Program Initiative is trying to bridge that gap by supporting research and development activities that increase the food security and incomes of the poor while maintaining public health and a clean urban environment.

IDRC is seeking to create a better understanding of the constraints faced by urban farmers who are often hampered by unfavorable local policies and limited access to resources. Already, IDRC raised the awareness of municipal governments in Latin America and the Caribbean with the collaboration of the Urban Management Program of UN HABITAT.

From 1997 to 2001, they worked with municipalities and community organizations throughout the region to draw out best practices in relation to urban and peri-urban agriculture. It led to the signing of the Quito Declaration by mayors and urban professionals at the international seminar

Urban Agriculture in Cities of the 21st Century" that took place in Quito, Ecuador in April 2000. More than 52 cities from the region have given so far their support to urban and peri-urban agriculture.

Canada Mortgage and Housing Corporation works actively on housing finance projects abroad, assisting developing countries and countries in transition to develop their own housing finance systems and policies. Canada's system of mortgage insurance makes housing finance and housing accessible to segments of the population that would otherwise not even be eligible for mortgages, both domestically and abroad. Furthermore, the Canadian housing system "Under one Roof" provides an interesting model for countries that may just be taking their first steps towards establishing their own housing systems.

* * *