

Municipal Governments and Sustainable Communities:
A BEST PRACTICES GUIDE

2004

FCM-CH2M HILL

Sustainable Community Awards

CH2MHILL



Canada





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FCM-CH2M HILL Sustainable Community Awards Best Practices Guide 2004

Each year, case studies of all submissions to the FCM-CH2M HILL Sustainable Community Awards that win or receive honourable mention are published in this Best Practices Guide for distribution to municipal governments across Canada. The Guide also includes summaries of all other submissions received.

The Awards Best Practices Guide 2004 is available electronically through FCM's Sustainable Communities Knowledge Network at: <http://kn.fcm.ca>. Click on **FCM-CH2M HILL Sustainable Community Awards** on the left navigation bar. For copies in other formats, please send your request to communities@fcm.ca.

Cette publication est disponible en français sous le titre *Prix des collectivités viables FCM-CH2M HILL : Guide des pratiques exemplaires 2004*.

Honouring excellence and innovation in municipal service delivery that contributes to a sustainable future

Across Canada, municipal governments are taking actions that reveal a deeper understanding of sustainable community development. Truly sustainable projects start with a shift from one-project, "silo" thinking to a more holistic, integrated approach where economic, social and environmental factors are inextricably linked.

These actions are celebrated each year with the **FCM-CH2M HILL Sustainable Community Awards**.

The Centre for Sustainable Community Development, housed at the Federation of Canadian Municipalities (FCM), encourages leadership and innovation using sustainable principles and practices. The Centre offers programs to build capacity and encourage best practices, such as Partners for Climate Protection and Community Energy Missions; financial assistance through the Green Municipal Funds' grants and loans; and networking Tools such as the Sustainable Communities Knowledge Network at <http://kn.fcm.ca>

CH2M HILL, one of Canada's largest full-service engineering firms, offers a wide range of design, engineering and environmental services in water and wastewater, environmental remediation, energy and industrial systems, telecommunications and transportation.

CH2M HILL is committed to the principles of sustainability and is working, both within the organization and with clients, to integrate the concept of sustainable development into all projects and corporate activities.

CH2M HILL also supports the American James C. Howland Awards for Municipal Enrichment, managed by the National League of Cities, to recognize the contribution of cities and towns towards improving environmental quality of life. Profiles of winners are available at <http://www.nlc.org>.

Sponsorship

The Government of Canada, through the Climate Change Action Fund, also supports the Awards through funding for Partners for Climate Protection.

Additional sponsorship is also provided by Transport Canada and FCM's Green Municipal Funds.

For more information about participating as a sponsor, contact the FCM Awards Office at:

FCM-CH2M HILL Sustainable Community Awards

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INTRODUCTION



WHO CAN APPLY

- FCM municipal members; and
- Participants in Partners for Climate Protection.

Municipalities of all population sizes are encouraged to apply.

Each municipal government

may submit a maximum of two projects.

AWARDS ELIGIBILITY CRITERIA

To be accepted by the Awards office, submissions must meet the following criteria:

- projects must demonstrate innovation and excellence in one of the award categories (buildings, energy/renewable energy, solid waste, sustainable community planning, sustainable transportation, wastewater, and water);
- applicants must follow the Guidelines found in the Application Form; and
- projects must have been completed within two years of the date of application or be in the final stages of implementation.

Projects that encompass more than one sustainable community development issue are encouraged.

HOW SUBMISSIONS ARE JUDGED

Awards submissions are reviewed and judged by a panel selected by FCM. In addition to meeting the Awards eligibility criteria, each submission is judged with special attention to the following elements:

- demonstration of an integrated planning and/or decision-making approach that recognizes the triple bottom line or encompasses more than one issue;
- innovation and excellence (e.g., how, and to what extent, the project improved upon previous approaches);
- demonstration of environmental and social benefits, and their impact on the community;

- demonstration of economic benefits and cost effectiveness, where applicable, including how the project has changed how economic and planning decisions are made at the municipal level;
- partnerships created or supported by the project (e.g., multi-departmental co-operation, private sector partnerships, community engagement, etc.);
- sustainability of the project (e.g., relationship to the municipality's sustainability goals, land-use plans, etc.); and
- communications and promotional activities (internal and external).

AWARDS RECOGNITION

Winners and honourable mentions are recognized in the Best Practices Guide and at an Awards ceremony at FCM's Annual Conference and Municipal Expo™.

FOR MORE INFORMATION

Consult FCM's Sustainable Communities Knowledge Network (<http://kn.fcm.ca>) for more information or contact the Awards office:

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Submissions to the FCM-CH2M-HILL Sustainable Community Awards this year demonstrate that municipal governments are leading the way to sustainable community development. In every region of Canada, municipal governments are adopting innovative strategies and practices that meet a “triple bottom line” of economic, environmental, and social goals.

This year’s award-winning projects reflect the continued commitment of municipal leaders and their partners to improve the quality of life in their communities. Since the Awards program was launched in 2000, many municipal governments have applied numerous times--some have been recognized as winners more than once! These same innovators are leading the way in other FCM initiatives, ranging from building green infrastructure with support from the Green Municipal Funds to developing a greenhouse gas reduction plan through participation in Partners for Climate Protection.

I encourage you to identify innovative projects in your community so that all FCM members can learn and benefit from the vast wealth of expertise across the country. By showcasing the “best of the best”, we hope to spark the imagination of other communities across Canada and encourage them to see firsthand the many benefits to be gained by investing in sustainable community development.

Ann MacLean

President

Federation of Canadian Municipalities



CH2M HILL in Canada is proud to partner with the Federation of Canadian Municipalities to recognize the achievements of forward-thinking municipalities across the country.

This *Awards Best Practices Guide* highlights the remarkable efforts made by municipal governments across the country in several categories. Clearly there is great enthusiasm and many specific drivers encouraging the adoption of sustainable business practices in Canada. After several years of observing the creativity of communities based on their FCM-CH2M HILL Sustainable Community Awards submissions, we continue to see progress in the field of sustainability. We expect to see even greater benefits as sustainable ideas continue to be adopted, modified, and improved upon by others.

Municipal leaders are often the champions of these efforts—however, many others in our communities can be active in creating, developing, and delivering sustainable solutions. Through strong leadership, public involvement, and innovative programs and ideas, municipal governments across Canada are improving the environment in significant ways and obtaining tangible results.

Whether you are a civic worker, community leader, city planner, or an interested citizen seeking the benefits of sustainability in your community, we hope that the FCM-CH2M HILL Sustainable Community Awards—through this *Awards Best Practices Guide*—will inspire you and your community to achieve new levels of sustainability in 2005 and beyond.

John Murray
President
CH2M HILL Canada

2004 Winners

BUILDINGS

City of White Rock Operations "Green Building"

Population: 18,000

SUMMARY

Reclaiming an abandoned wastewater treatment plant, the City of White Rock built a new operations building that is expected to reduce energy costs by 40 per cent. The old treatment tank walls served as the building's foundation and all new building materials were purchased from within a 500-km radius to reduce transportation-related emissions. Much of the salvaged material from demolition was reused, diverting about 97 per cent of construction waste from landfill. The building was oriented for a southern exposure to take advantage of passive solar heating and lighting and features an energy-efficient building form and envelope, natural ventilation systems, rainwater reuse and other water conservation measures, as well as water source heat pumps.

BACKGROUND

In 2000, the City of White Rock's council passed legislation declaring its intent to pursue and promote sustainable objectives in all its city planning and development. "One of council's goals, in particular, was to reduce energy consumption and costs," said Wayne Baldwin, the city's chief administrative officer.

Council enshrined this goal in its *Official Plan*, stating that "The city will support green building initiatives that incorporate environmentally advanced design and energy systems." A bylaw also commits the city to conduct its affairs in an environmentally responsible manner, and several other city policies support initiatives that reduce energy costs and address issues of air quality. White Rock joined FCM's Partners for Climate Protection in 2001, a program that commits municipalities to a municipal and community-wide program to reduce greenhouse gas emissions.

White Rock identified an old sewer treatment plant as an ideal candidate to support its objective to showcase new green building techniques, and also to provide a more pleasant work environment for its employees. With a relatively small tax base, however, money for large capital projects was limited.



PROJECT DEVELOPMENT

The city received a grant from FCM's Green Municipal Funds to study how it could refurbish the sewer treatment plant into a new operations building.

The plant, built in the 1950s, was decommissioned in the 1970s and the site and the office continued to function as the city's public works yard.



An architectural firm experienced with the LEED (Leadership in Energy & Environmental Design) Green Building Rating System was retained to suggest a number of strategies that could reduce the environmental impact of the proposed new building, suggest technologies and techniques that could be used, and determine the cost. The study was completed in March 2002 and its findings presented to city council.

During this time, White Rock had also applied for project funding through the Canada-BC Infrastructure Program and received a grant of \$898,000 in federal and provincial funding. The city funded the difference for this \$1.5 million project.

The community, and the staff who would ultimately work in the building, were involved in the design stage. At the time, the project was quite controversial because the site was in a residential area. "It's ironic because it used to be a sewage treatment plant," said Mr. Ted Haight, acting operations director. "There were people who wanted the building located somewhere else but the new design was such an improvement over the old one that people found it more attractive, and that ultimately led council to move on it."

City council approved the project and construction began in the summer of 2002 and was completed in March 2003.

PROJECT DETAILS

The White Rock Operations Building consists of work spaces for nine employees, a crew lunchroom, washrooms and change rooms, shared work space for an inspector, a foreman and three facility employees, a first aid room, and two meeting rooms.

The facility was built on top of the plant's old foundations. "That was the biggest opportunity found during the feasibility study," said Mr. Baldwin. Ted Haight estimated the savings from this opportunity alone to be between \$40,000 and \$50,000.



CITY OF WHITE ROCK, BRITISH COLUMBIA

Reusing the foundations turned into a critical issue when White Rock applied for funding through the Canada-BC Infrastructure Program, which has strict criteria for refurbishing buildings.

Mr. Baldwin explained that if the city had not been able to use the old foundations, it would not have received the grant. “Our engineer argued for it and the Infrastructure Program actually ended up rewriting its criteria to allow for it.”

The building includes several innovative architectural strategies and mechanical systems, some of which include:

- an energy-efficient building envelope, including a green roof;
- stormwater capture and storage (the water is reused for flushing toilets, washing city vehicles, and in landscaping);
- a water source heat pump that provides the majority of the heat to the building;
- a new hot water heater with 85 per cent thermal efficiency;
- programmable lighting fixtures; and
- the reuse of materials salvaged from the demolition of the old treatment plant.

Reusing building materials kept the overall costs down. In addition to using one of the treatment tanks to capture stormwater (the tank has a capacity of 340,000 litres), timber, wood decking and some insulation was also recovered in the demolition phase and reused.

The building faces south to capture passive solar heat and light. Shadow studies were used to design shading measures for each direction of the building. For example, on the east side, the roof overhangs and newly planted deciduous trees control morning heat gains and glare. The roof also overhangs on the south side and a nine-metre sunscreen, set lower than the roof eave, controls how much sun enters the building during summer months.

White Rock’s prevailing winds create negative pressures on the north and west sides of the building, promoting a natural airflow. Natural ventilation and cross-ventilation was augmented through strategically placed windows, which eliminate the need for air conditioning.

The green roof cuts heat loss and reduces peak stormwater runoff during wet weather. The city partnered with the Greater Vancouver Regional District (GVRD) to work on a two-year green roof study. “Our project gave the GVRD a chance to do a study and to make recommendations for future projects,” said Mr. Haight. “The results so far show how green roofs can reduce urban ‘hot spots’ and stormwater discharges.”

A water source heat pump heats the stormwater from the storage tank to supply much of the heat for the building, and additional heat is supplied through a solar tube collection panel. Rooftop solar panels produce electricity and the city entered into a two-year contract with BC Hydro to provide green power credits from the generation of electricity.

Indigenous plants were used to restore the area’s landscaping and the parking lot was constructed with porous materials that allow stormwater to be more easily absorbed into the ground.

Sustainable transportation features were added, such as bicycle racks and preferred parking for carpools.

Mr. Baldwin said that the project would not have been completed without the support of a few key people and city council. “Council had put aside money for the building’s replacement, but this wasn’t a conventional building,” he said, noting that it cost about eight per cent more to build than a typically-designed municipal facility. Mr. Baldwin and Mr. Haight also praised former Mayor Hardy Staub, Doug Stone, former director of operations, and Greg Scott, the city engineer, for helping to move the project forward.

RESULTS

- The building received a LEED Certified Gold rating.
- By carefully salvaging materials for reuse, 97 per cent of the construction waste from demolition was diverted from landfill. All new materials were purchased within a 500-kilometre radius to reduce emissions related to transportation.
- The combination of all the techniques used should result in an approximately 55 per cent decrease in operating costs and a 40 per cent reduction in energy requirements. The heat pump system alone is estimated to save over \$1,500 in energy costs each year.
- Using stormwater for toilets, landscaping, and truck washing will reduce annual water use by about 30 per cent (a reduction of almost 24,000 litres).
- The building cost more to construct than a conventional building, but with lower operating costs the payback is approximately 11 years.
- The American Institute of Architects chose the building as one of its Top Ten Green Projects for 2004. This award, plus the other recognition the building has received, has fostered a sense of pride in the community. “The community has a sense of ownership now and they want to know more about green issues,” said Mr. Baldwin.



LESSONS LEARNED

- **ASSEMBLE A GOOD TEAM.** The city used several outside consultants who had expertise in the techniques and practices now used in the operations building. The architectural consultants who designed the building also partnered with two other firms to design the solar array.
- **THINK LONG-TERM.** Mr. Haight noted that green projects often involve long-term thinking, so you have to be aware and ready for that. “You also have to involve your own staff, right from the start,” he said. “If you take a ‘think outside the box’ approach then you have the potential to do good green projects.”
- **SEEK FUNDING EARLY.** Although there is little the city could have done to speed up the grant process (from federal and provincial governments), Mr. Baldwin and Mr. Haight noted that seeking funding early can shorten a project’s time frame.

RELATED AND FUTURE INITIATIVES

Due to the success of this project, the White Rock Operations Building will be used in future as the “blueprint” for designing or retrofitting other municipal buildings. The city originally wanted to include a geothermal heat pump (which uses the Earth’s warmth for heating) as part of the building’s mechanical system, but the technology proved too expensive. “We would like to review that idea,” said Mr. Baldwin. “The economic barrier is high, but the payoff is huge and you can sell the idea on a sustainability issue.”

The use of porous materials for the building’s parking lot has also spurred the city to look at changing its engineering standards to provide more permeable surfaces on city streets.

PARTNERS AND COLLABORATION

Internal

Operations Department
City Advisory Design Panel

External

Canada-BC Infrastructure Program
Busby & Associates Architects Ltd.
Greater Vancouver Regional District (GVRD)

PROMOTIONAL ACTIVITIES

An open house was held for the public when the building opened. City staff promote the new techniques and practices to White Rock’s development community and to the general public through its publication, *Leading by Example*, available on the city’s Web site. Residents and tourists alike have toured the building. “We’ve had busloads of people come to look at it,” said Mr. Baldwin. “It serves as an example to a wide range of people, not just those in the White Rock area.”

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Turbogenerator Installation at the Waste-to-Energy Facility

Population: 2,000,000

SUMMARY

Since opening in 1988, the GVRD's Waste-to-Energy Facility (WTEF) has disposed of 250,000 tonnes of waste annually, about 20 per cent of the total solid waste disposed of in the Greater Vancouver area. In order to create electricity from the steam produced by the facility, the GVRD installed a 25-megawatt (MW) turbogenerator. The project resulted in annual revenues of about \$5.3 million through the sale of electricity, lower costs associated with waste disposal, and greenhouse gas (GHG) emission offsets of 66,000 tonnes. Over 150 full-time jobs were created over the two-year construction period, and the SEEgen (Social, Economic and Environmental generation of electricity) project was designed for easy access and modification for a future project that will include a district energy system.

BACKGROUND

A participant in FCM's Partners for Climate Protection (PCP) since 1996, the Greater Vancouver Regional District (GVRD) is a recognized leader in sustainable community initiatives. The GVRD consists of 21 individual member municipalities and takes a very active role helping its members to co-ordinate PCP-related and other sustainable development activities. GVRD has submitted numerous successful applications to the Green Municipal Funds (GMF).

For example, the GVRD partnered with the City of North Vancouver on an eco-industrial park; with the City of Burnaby on a study to examine parking supply and other sustainable transportation opportunities for commuters; and with the City of Vancouver on a sustainable streetscape project that aims to protect fish habitat.

The GVRD's waste-to-energy facility (WTEF) is located in the City of Burnaby and provides waste disposal services to about two million people, disposing of about 250,000 tonnes of garbage every year, or 20 per cent of the total municipal solid waste disposed of in the Greater Vancouver area. The WTEF has state-of-the-art pollution control and has had many 'first' successes in its industry: the first in North America to implement a treatment for mercury reduction and the first in Canada to install an aqua-ammonia injection system for NOx reduction. This project is the first of its kind in Canada to sell both steam and electricity from the combustion of MSW. The WTEF is also

the second facility of its kind in North America to be certified by the International Standards Organization for Environmental Management Systems (ISO 14001).

This project is one of many initiatives that the GVRD has undertaken to fulfill its vision of providing cost effective and environmentally safe waste disposal and recycling services. It also complements the objectives set forth in several of the GVRD's long-term planning strategies. The WTEF operates under the direction of the GVRD's *Solid Waste Management Plan* and is committed to continual improvement in environmental and social responsibility and cost-effective operations.

PROJECT DEVELOPMENT

The WTEF produces steam during the combustion process and, since opening in 1988, a nearby paper-recycling mill had been using about two-thirds of the steam in its paper dryers. The revenue from steam sales partially offset the WTEF's operating and capital costs. In July of 2000, the mill was forced to shut down two of its three machines due to economics, thus decreasing its demand for steam and prompting the GVRD to look for another solution.

After researching various options, the GVRD decided to install a 25-megawatt (MW) turbogenerator (a combined turbine and generator) at the WTEF. The turbogenerator would use the steam to create 15 MW of electricity, while still providing steam to the paper-recycling mill with little or no additional impact to the environment. Revenues from the electricity produced would be used to keep disposal costs down for GVRD taxpayers. "We also wanted to provide an 'insurance policy' on the revenues from the steam if the paper recycling mill ever shut down permanently," said Chantal Babensee, the GVRD's senior project engineer.

Since the WTEF is located in Burnaby, the City of Burnaby was involved in the approvals process and for the necessary building permits. "The project also established a basis for a future eco-industrial network in Burnaby," said Ms. Babensee, explaining that the GVRD used this opportunity to study the feasibility of a district heating system that could supply heat to the new Burnaby Business Park, a project that received a grant from FCM's Green Municipal Funds.

PROJECT DETAILS

The turbogenerator project—dubbed SEEgen, an acronym for Social, Economic and Environmental generation of electricity—began operating in July 2003. The GVRD funded and managed the project, while Montenay Inc., the operator of the WTEF, provided technical expertise and construction management. BC Hydro assisted in the design and construction phases and buys the electricity generated.

A feasibility study was first conducted to ensure that the needs of Norampac, the paper-recycling mill, were met while providing a consistent amount of electricity to BC Hydro. This presented a technical challenge depending on whether or not Norampac increased or decreased production, or shut down entirely.

Design and construction considerations, therefore, needed to consider the impact on the steam supply to Norampac and also ensure that all modifications and additions were designed within the existing footprint of the facility to minimize the impact on the surrounding community and parkland.

Technical members of the project team visited facilities in the U.S. and Europe to learn from their experiences and innovations. Studies were also conducted to evaluate noise and visual impacts. The WTEF's high voltage line was eventually installed underground, greatly reducing the visual impact of the project to the community. The WTEF's air-cooled condenser was designed to use less process water, and both the condenser and the turbine operating floor were elevated to make more efficient use of space. Specially designed fan blades kept the ambient noise in the surrounding parkland to a minimum.

To be economically feasible, the turbogenerator—manufactured in the Czech Republic at a cost of \$7.6 million—was designed to allow full use of the steam, extracting steam at a lower pressure for the mill, and using high-pressure steam to produce electricity. In fact, if the mill were to be shut down, all of the steam would be used to produce electricity, providing even more revenue.

Boiler modifications were made to increase heat recovery and the quality of the steam. These modifications—which included a superheater—required Norampac to make changes to its equipment to allow for the decrease in steam pressure. “They were very co-operative during scheduled shutdowns when we couldn't provide them with steam,” said Ms. Babensee. “We worked with them to develop an alternate source of steam, and to their credit, they saw the benefits and took the short-term pain knowing it would help us both in the long-term.” As part of the agreed to changes, Norampac was able to permanently shut down its steam plant.

A section was added to the WTEF to house the turbogenerator, which is approximately 15 metres wide by 35 metres long. Upgrades to the existing combustion control system optimized the steam conditions in order to generate as much electricity as possible.

During the early phases of the project, Montenay asked the Pembina Institute, an environmental policy research and education organization, to train WTEF employees. “It was the first sustainability training we took and it was an introduction into how

we should be thinking and how we could improve,” said Ron Richter, plant manager for Montenay, Inc. “It created the right atmosphere from the beginning.” Pembina also prepared a life cycle value and sustainability assessment to evaluate the economic, environmental and social impacts of the WTEF.

The project cost about \$36 million and Ms. Babensee reported no difficulties from the political level. “This was a capital intensive project and the GVRD Board was very supportive throughout the entire process.” The project's estimated payback is nine years.

Ms. Babensee is enthusiastic about her work. “Waste-to-energy is good!” Ms. Babensee concluded. “Once you see a project successfully completed there's more of a push to see what else you can do.”

RESULTS

- An annual reduction of 66,000 tonnes of GHG emissions by displacing BC Hydro's use of fossil fuels to generate the equivalent amount of electricity.
- 15 MW of electricity have been added to the BC Hydro grid. The minimum annual revenue from the sale of electricity is estimated at \$5.3 million.
- Eliminated emissions associated with the paper recycling mill's oil burning steam plant. The plant was permanently shut down, saving the paper mill up to \$1 million.
- Nitrous oxide emissions have been reduced as a result of increased combustion control efficiency.
- Over 150 full-time construction jobs were created over the two-year construction period, and four full-time operational jobs.
- The SEEgen project won a PowerSmart Excellence Award in May 2004, a 2003 award for the best large energy facility from the American Society of Mechanical Engineers, and a 2003 award from the Association of Professional Engineers and Geoscientists of B.C.

LESSONS LEARNED

- **SHARE THE RISKS.** The GVRD stated that the best decision it took was the sharing of risks and responsibilities by using a partnership approach. Risk areas were allocated to the partners that had the relevant expertise to manage them. For example, the GVRD took control of municipal solid waste flow management during construction and built relationships with the waste haulers.

- **RESEARCH WITH AN EYE TO THE FUTURE.** Ms. Babensee stressed the importance of conducting a thorough investigation of how the technology will be used. “To make it more integrated, we modified the design of the turbine so that in future it could supply district heating,” she explained. “If we hadn’t done that at the time, it would be financially impossible to do it later.” Looking at all future opportunities will help the GVRD double the use of the energy for a bigger payback.
- **EDUCATE YOUR PARTNERS ABOUT SUSTAINABILITY ISSUES.** The Pembina Institute was approached to provide training for all WTEF employees to reinforce the principles of sustainability and to ensure that those principles were taken into consideration during the design, planning and operating stages. “We wanted them to have that mindset from the beginning,” said Ms. Babensee.

RELATED AND FUTURE INITIATIVES

The GVRD is now looking to generate electricity from the water supply in the Capilano watershed and is working with the private sector to look at ways of reducing carbon dioxide (CO₂) emissions from the WTEF’s stack. The company they are dealing with has experience in doing similar projects where the recovered CO₂ is used to make calcium carbonate, a material used as a whitening agent in paper making.

As a result of the investigations for its *SEEGen* project, the GVRD also applied for and received a GMF grant to study the feasibility of a district heating project using heat from the WTEF.

“With regard to district heating, we have a lot of excess energy at the WTEF plant that we could utilize to power greenhouses, for example, which use a lot of fossil fuel energy,” said Mr. Richter. A feasibility study has shown that a district heating system using the WTEF’s excess energy has a potential to further reduce GHG emissions and other common air contaminants by 26,200 tonnes annually.

The GVRD’s commitment to sustainable community development extends well beyond energy-related projects. Over the course of several years, the GVRD has received GMF grants and loans for other innovative projects, such as recovering heat from municipal sewers to heat buildings, purchasing 200 trolley buses that are powered by renewable energy sources, and a pilot program that encourages commuters to take public transit and then drive a “Station Car” to and from work.

In addition, the GVRD’s *Century Urban Systems Plan* uses the latest tools and concepts for green infrastructure and energy planning and was chosen to be part of Canada’s submission to the 22nd World Gas Conference in Tokyo in 2003. This long-term sustainability strategy also received GMF funding.

PARTNERS AND COLLABORATION

Internal

Engineering and Construction Department:

- Contracted Services Division
- Major Projects Division

Policy and Planning Department:

- Regional Utility Planning Division
- Demand Side Management Division

Communications and Education Departments

External

Montenay Inc.

Norampac Inc.

City of Burnaby

BC Hydro

Pembina Institute

PROMOTIONAL ACTIVITIES

Although no formal public consultations were held, no complaints from the public have been received. That being said, the WTEF hosted more than 200 tours to members of the public and media throughout the construction and start-up of the project.

The project team prepared news releases and fact sheets, and the project was covered in daily and community newspapers, local and national television, and in the journal of the Association of Professional Engineers and Geoscientists of British Columbia. BC Hydro also highlighted the project on its Web site.

GVRD staff was kept up to date through Intranet postings and on the GVRD Web site, and presentations were given to some staff members. The GVRD also shared the details of this project at the 2003 conference of the Solid Waste Association of North America and at the 2003 North American Waste-to-Energy Conference.

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SOLID WASTE

Solid Waste Management Plan

Population: 9,752

SUMMARY

The City of Selkirk's Solid Waste Management Plan increased diversion rates by an average of 44 per cent and helped to lengthen the life of its landfill. The landfill was due to close in 2002, so the city adopted a wide-ranging plan that addressed business, commercial, institutional and residential waste issues. A combination of municipal purchasing policies, material ban bylaws, the construction of a new transfer station, and fee-based garbage collection as well as bag limits has diverted residential waste by 38 per cent and self-haul waste by 51 per cent. The city also initiated a three-phase centralized composting program, beginning with a subsidized residential backyard composting program. Its goal is to divert 50 per cent of waste by 2006 and 85 per cent by 2011.

BACKGROUND

The City of Selkirk has approximately 3,500 residential garbage collection points (single and multiple family dwellings) and about 300 businesses. Before adopting its *Solid Waste Management Plan*, the city was throwing close to 8,000 tonnes of waste into its landfill every year.

In 1989 the city's waste collection contract with BFI Canada was due for renewal. A city councillor, Bunny Cooper, wanted to begin a waste diversion program and urged city council to request that BFI, as part of its contract, begin collecting recyclable material. City council endorsed the idea and in 1990 BFI began a blue bag recycling program in partnership with ARC Industries, a training centre for mentally challenged adults.

In 1997 the city completed a feasibility study to expand its landfill. The city's landfill was due for closure so the city purchased a 70-hectare site adjacent to it for its expansion. Unfortunately, because the site was in another municipality, a conditional use permit was refused and the landfill was closed in November 2002.

PROJECT DEVELOPMENT

Although the origins of the city's *Solid Waste Management Plan* date as far back as 1990, it wasn't until the landfill closure date became closer that the city hired a consultant to review existing waste reduction programs in Manitoba and elsewhere. The intent was to use that information to create a waste management plan for Selkirk that could also be used as a model by other Manitoba communities.



CITY OF SELKIRK, MANITOBA

A detailed waste composition study was not completed but a preliminary assessment revealed that much of Selkirk's waste could be recycled or composted. At the time, residential and commercial waste was collected weekly, based on a rotating five-day cycle and the city was diverting about 10 per cent of its waste through the blue bag program. The city also separated selected waste streams at its landfill, such as tires and certain appliances.



The city set up a task force comprised of the mayor, two councillors, and the director of operations to develop the plan. The plan took about a year to complete and its major objectives were to increase waste diversion by 30 per cent by 2003, by 50 per cent by 2006, and 85 per cent by 2011.

PROJECT DETAILS

The task force studied the information compiled by its independent consultant. "Initially the consultant recommended building a larger transfer station to handle all of our waste," recalled Randy Borsa, the city's director of operations. Mr. Borsa toured a variety of transfer stations with the consultant and found that most communities that were similar in size to Selkirk and within 40 kilometres (25 miles) of a major landfill had their waste directly hauled to landfill.

The city chose this route, using BFI as its waste contractor who in turn uses Metro Recycling of Winnipeg as the recycling contractor. It also opted to downsize its current transfer station. The station is now used to store recyclables before they are sent to Metro Recycling, to house its residential composting program, and to provide a drop-off for leaf and yard waste, tires, waste oil, scrap metal, and hazardous materials. The city also operates a freon removal service for refrigerators and air conditioners at the transfer station.

To augment the consultant's findings, the city also studied waste trade magazines and researched Web sites in jurisdictions throughout Canada, the United States and Europe. "We wanted to assess current trends, goals and accomplishments in waste minimization," Mr. Borsa explained. "In general, most had blue bag or blue box programs, composting, and most stressed the importance of an education program."

The city wanted to promote activities that would avoid the generation of waste and be convenient for residents. Reducing waste had environmental, as well as economic benefits, as landfill-tipping fees would be reduced as waste production decreased.



CITY OF SELKIRK, MANITOBA

The city moved from blue bags to blue boxes and changed its recycling pick up from bi-weekly to weekly. Recyclable materials include paper, cardboard, cans, glass, and certain plastics. Each residence was provided with a blue box and, depending on their needs, apartment complexes were provided with one large recycling bin for every 10 units.

In conjunction with the blue box program, the city imposed a two bag or can limit on residential garbage to encourage people to reduce waste at the source. Residents purchase tags—at \$1 each—for any bag or can over the limit. Many residents were initially unhappy with this part of the program. “No one likes change, but once we explained the program they realized that it’s needed,” said Mr. Borsa.

The city provided a 50 per cent subsidy to residents to purchase a \$50 backyard composter. “With the cities of Winnipeg and Portage la Prairie, we were able to put in a joint effort and purchase the composters,” said Mr. Borsa. “We now have a waiting list of people who want them.” People who choose not to, or are unable to, compost at home have the material picked up with their curbside garbage also in the summer months. Leaf and yard waste, as long as it is in clear bags is picked up but also can still be dropped off at the transfer station. The material is composted on site and is used in city landscaping.

To launch the new initiatives, the city developed public awareness campaigns to educate the public about the changes in waste collection and to provide additional information. The city:

- sent newsletters to all city residents explaining the changes and offering tips on waste reduction, composting, and recycling;
- provided local radio and regional television media with text for public service announcements;
- provided pre-written articles and advertisements on waste management to the local newspaper; and
- set up a “Hot Line” to promote the new programs and a composting “Help Line” to offer advice and solutions.

The city eliminated commercial waste pick-up except for small businesses that must purchase the \$1 garbage tags for all their waste. In exchange for the eliminated pick up, the city reduced the business tax by 25 per cent, roughly equal to the amount businesses were being charged for garbage pick up. Businesses are responsible for disposing of their waste through independent haulers but the city continues to pick up their recyclable materials.

The project was financed by the city, with an additional \$25,000 grant from Manitoba Conservation’s Waste Reduction and Pollution Prevention (WRAPP) Fund. Revenues from the sale of recyclable materials offset the city’s operating budget, which is expected to decrease to about \$618,000 in 2004 from a peak of \$797,000 in 2003.

In Manitoba, the Manitoba Product Stewardship Corporation (MPSC) provides revenues to municipalities through the sale of recyclable materials. Municipalities file certificates showing the number of tonnes of materials recycled. The 2003 rate per tonne paid by MPSC to municipalities was \$152, netting the city close to \$100,000 in revenue. The rate decreased to \$145 per tonne as of April 1, 2004.

The Solid Waste Management Plan was launched on June 1, 2003. Between June and November 2003 the city landfilled just over 1,000 tonnes of waste, an almost 40 per cent reduction and 10 per cent higher than the city’s original goal.

RESULTS

- 387.8 tonnes of MPSC-approved products have been recycled.
- Recycling of other materials has also increased: 20 tonnes of metal, 3,037 tires, 4,080 litres of waste oil, and 805 litres of used fuel to name a few. Up until November 2002, these materials were sent to landfill.
- Implementing the bag/can limit and requiring residents to purchase \$1 tags for additional waste has promoted recycling and reusing.
- Business taxes were reduced in exchange for eliminating commercial waste pick up. “In some cases the business tax was as high as \$10,000 a year, so that’s a substantial decrease,” said Mr. Borsa.
- The city implemented a purchasing policy that favours products made with recycled content or that are recyclable or reusable. It also developed a by-law to ban certain materials from landfill.
- The city has reduced the number of employee hours at the transfer station. It has estimated that the reduction in part-time staff hours has already saved the city approximately \$30,000.

LESSONS LEARNED

- **LEARN FROM OTHERS.** The city’s consultant and city staff reviewed similar programs in several municipalities and toured several facilities. Learning from others helped the city plan its own needs and avoid the most common pitfalls.
- **HIRE AN INDEPENDENT CONSULTANT.** Mr. Borsa explained that the city’s consultant experience and knowledge of other programs (“been there, done that”) helped to decrease the amount of staff time that would otherwise have been required to research programs and opportunities.



- **CHANGE TAKES TIME.** Many residents were unhappy with the bag/can limit, and some had their blue boxes stolen. Mr. Borsa reported, however, that perceptions have begun to shift and that as residents become accustomed to the program, many of these problems will be resolved.

RELATED AND FUTURE INITIATIVES

As the *Solid Waste Management Plan* was being developed, the city was working on a full engineering study of all its municipal facilities. With a grant from FCM’s Green Municipal Funds, the city identified ways it could reduce energy use, greenhouse gas emissions, and improve its infrastructure.

The facilities studied included the city’s recreation complexes, civic arenas, and fire hall, public safety and public works buildings, and its sewage and water treatment plants. The study evaluated lighting upgrades, automated heating system controls, water conservation devices, solar heating technologies and mechanical system measures.

The study’s findings were presented to city council in November 2001, and after a revised financing proposal was developed, council approved the recommendations in the spring of 2003. “The consultant proposed taking the costs to do the first phase from the utility reserve and pay the reserve back through energy savings,” said Mr. Borsa. The city has now implemented some of the recommendations including the installation of a geothermal heat pump and a solar wall.

PARTNERS AND COLLABORATION

Internal

Operations Department

External

- Resource Conservation Manitoba
- City of Winnipeg
- City of Portage la Prairie
- Manitoba Product Stewardship Corporation (MPSC)
- Manitoba Conservation’s Waste Reduction and Pollution Prevention (WRAPP) Fund
- Manitoba Conservation’s Pollution Prevention Branch (SDIF) Fund

PROMOTIONAL ACTIVITIES

The city promoted the project through several means including:

- public information sessions;
- a survey through *Managing Selkirk’s Solid Waste Newsletter*;
- promotional materials, such as brochures, posters, story boards and displays;
- presentations at the 2003 Solid Waste Association of North America (SWANA) conference in Brandon, Manitoba and at the regional recycling meeting of MPSC in May 2003; and
- reproducible handout kits and booklets for public education on composting and a “how to” manual for other communities that detailed how to set up a community composting program.

Several articles about the solid waste management plan were also published in *The Selkirk Journal*, the city’s weekly newspaper.

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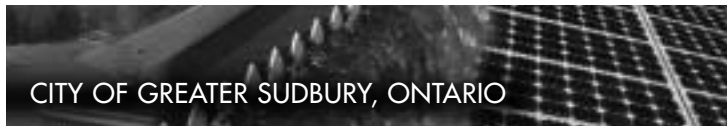
Additional Web sites:

Manitoba Product Stewardship Corporation: www.mpsc.com

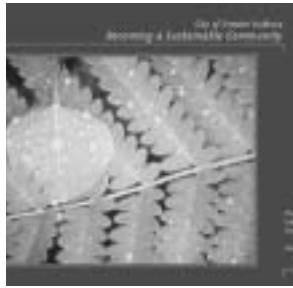
Resource Conservation Manitoba:

www.resourceconservation.mb.ca

To download a copy of RCM’s *Practical Strategies for a Home Composting Program: Toolkit for Manitoba Communities* click on:
www.resourceconservation.mb.ca/cap/resources.html



SUSTAINABLE COMMUNITY PLANNING



EarthCare Sudbury Local Action Plan

Population: 156,000

SUMMARY

The EarthCare Sudbury Local Action Plan is part of the City of Greater Sudbury's commitment to Partners for

Climate Protection. While developing the plan, the city discovered that it spent close to \$400 million each year on energy costs. The objective is to reduce those expenditures, while achieving other social, economic and environmental benefits. Under the plan's energy retrofit initiative, Greater Sudbury has already saved nearly \$1 million in energy costs and reduced greenhouse gas (GHG) emissions by 26 per cent. Greater Sudbury's community energy plan also outlines how it will become more energy self-sufficient through local green energy and renewable energy projects to be implemented within the next 50 years.

BACKGROUND

The City of Greater Sudbury has a legacy of environmental damage stemming from mining activities. Despite an impressive recovery, the city still had much work to do to enhance its environmental image.

Greater Sudbury joined Partners for Climate Protection (PCP) in 1997. While working on PCP's first two Milestones—developing greenhouse gas and energy use inventories and setting reduction targets—it discovered that it spent close to \$400 million annually in energy. Most of that money, and its spin-off economic benefits, leaves the community. The inventory work, coupled with council's desire to pursue the local benefits of environmental action, spurred the city to focus much of its efforts on the energy side.

In 1999, with the support of the International Council for Local Environmental Initiatives (ICLEI), Greater Sudbury began work on PCP Milestone Three to develop its local action plan: *Becoming a Sustainable Community*.

PROJECT DEVELOPMENT

Municipalities generate large amounts of GHG emissions. Greater Sudbury became involved in climate change issues because it wanted to make significant emission reductions by increasing energy efficiency and mobilizing its entire community to take action.

The energy use and GHG inventories showed how much money the community was spending on energy. "I was surprised by the

significance of transportation in our profile," Paul Graham, the city's plants engineer, recalled. "I didn't think it would be as high but it accounted for 27 per cent of our total energy."

A steering committee was formed comprised of two staff members and five city councillors. At the time, the city had not yet amalgamated with other regional municipalities and these councillors represented almost half of city council.

The committee first identified the key stakeholders from all sectors of the community, then approached potential partners and secured a commitment, one organization at a time. This type of approach is known as community-based social marketing (CBSM), which emphasizes direct contact among community members in order to change behaviour, by first identifying barriers to change, and then developing initiatives to overcome them.

PROJECT DETAILS

Greater Sudbury applied to and received funding from the Government of Canada's Climate Change Action Fund to proceed with its EarthCare Sudbury planning process. Council also set aside a budget of \$240,000 to cover staffing costs to finalize the plan.

By the spring of 2000, 38 community partners had signed the EarthCare Sudbury declaration, a commitment to support the city as it implemented its local action plan. "We didn't ask the partners for any money, just their intellectual power," said Mr. Graham. These partners represented many areas of the community—provincial and federal government departments and agencies, school boards, universities and colleges, businesses and industries, utility companies, and non-profit community organizations.

The planning process formally began in February 2001 with a day-long workshop. During the roundtable discussion, participants discussed the benefits of the process and began to develop the plan's vision, values, and goals. Following the session, over 100 participants from the 38 community partners volunteered to sit on five working groups: residential, industrial/commercial/institutional, municipal, public education and outreach, and business plan development.

The working groups identified 13 distinct areas for action and developed economic, environmental, and social objectives for each. The areas include land use planning, energy, transportation, air quality, solid waste, water and wastewater, eco-procurement, food, pesticides and soil.



The plan's three overall goals are to:

1. Enhance the environmental health of Sudbury and thereby improve the social and economic well-being of future generations.
2. Take environmental responsibility by carrying out local actions that contribute to community sustainability and the reduction of GHG emissions.
3. Share knowledge on progress with Greater Sudbury citizens and share knowledge and experience gained with other communities.

This process revealed that there were tremendous opportunities in energy-related projects and these would become fundamental to the EarthCare Sudbury plan. Greater Sudbury had already made great strides in energy efficiency with a building retrofit initiative, reducing energy costs by 30 per cent—an estimated yearly saving of \$1 million—and GHG emissions by 26 per cent.

As part of the process, the city developed a separate *Community Energy Plan* that aims to produce half of the community's total energy locally. It identifies a number of renewable energy opportunities, such as small-scale hydro projects, wind generation, capture and use of landfill gas, the use of biodiesel, geothermal projects, and a solar water heater program.

“The real challenge is structuring ownership models so that the revenue created by these projects stays in the community,” Mr. Graham explained. “If outside consortiums come in and build the projects, it's just like us giving away any other resource without economic benefit. The difference with our plan is that it involves a far more proactive approach that will require investment with the long-term benefit of a sustainable revenue stream.”

In May 2001, Greater Sudbury held a public forum to seek the community's input on the plan's draft goals and objectives. The public's feedback was incorporated into a second draft that was circulated to all of the community partners and working groups. The plan was refined and in December 2001 the city held a one-day meeting to review it.

Some communities that develop local action plans begin with easy, short-term actions that produce early results. Greater Sudbury took a different approach, opting to lay a solid foundation for implementation that will ensure long-term sustainability.

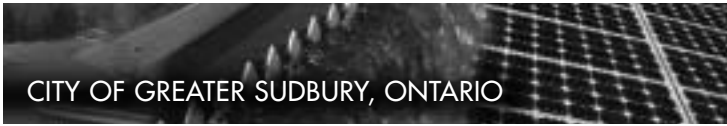
“The city has taken many actions on environmental innovation and energy initiatives but the priority is to establish the EarthCare Sudbury Institute,” said Mr. Graham. The Institute will be a community-based organization that will take the lead in implementing the plan's activities with EarthCare Sudbury partners steering its direction.

One of the Institute's goals is to create a sustainable revenue stream by charging members an annual fee. “The community partners would become members and the fee structure will be based on their ability to pay,” said Mr. Graham. “The aggregate of the annual fees could raise a significant amount of money without taking a toll on any one organization or taxpayers.”

The EarthCare Sudbury local action plan was finalized and adopted by city council in September 2003. The plan was launched on October 9, 2003 and a second declaration was signed, this time by 93 community partners.

RESULTS

- The plan aims to reduce GHG emissions by 30 per cent below 1990 levels within 15 years. Part of this goal includes a 10 per cent reduction in emissions from transportation sources.
- A monitoring program will establish the procedures to evaluate short- and long-term goals.
- The plan will be reviewed every five years to re-examine its goals, objectives, and targets, and to report on progress.
- The separate *Community Energy Plan* was supported by a grant from FCM's Green Municipal Funds (GMF). Through this work, Greater Sudbury received an additional GMF grant to assess wind turbine technology and has now established partnerships with Northland Power Inc. to develop wind farms.
- In 2002, Greater Sudbury was chosen as the site of the first Eco-Tourism Conference and Trade Show in Canada to mark the international year of Eco-Tourism.
- Working with Natural Resources Canada, EarthCare Sudbury launched an anti-idling campaign in October 2001 to reduce emissions by asking drivers to turn off their engines while parked.



LESSONS LEARNED

- **PARTNERSHIPS ARE KEY BUT NEED TIME TO DEVELOP.**
“The time it took to engage the partners was a surprise,” said Mr. Graham. “We thought it would be a one-year effort but it turned out to be two and half years.” He stressed, however, that this was one of the most important aspects in developing the plan. “Our partners were asked to sign a declaration to agree to join with the city to implement the plan and that built momentum.”
- **OBTAIN POLITICAL AND SENIOR MANAGEMENT SUPPORT.**
Political support for the plan was obtained very early on in the process. One of the reasons for this was the amount of money the community spent on energy use, which gave council an impetus to get behind the planning process. “You also need to bring senior management along,” said Mr. Graham. “There are such competing pressures on the operations of a municipality and it’s very easy for them not to focus on environmental action.”
- **ENVIRONMENTAL PLANNING HAS STRONG ECONOMIC DEVELOPMENT TIES.** As demonstrated by the inventory process, almost \$400 million in energy expenditures and related economic benefits left the community each year. Greater Sudbury recognized and understood the link between the environment and the economy early on and was able to use that connection to gain support from all of its partners, particularly the business community.
- **COMMUNITY-BASED SOCIAL MARKETING (CBSM) TECHNIQUES.** “An understanding of social marketing principles led us to use the declaration as an engagement tool,” said Mr. Graham, who credited FCM for introducing the city to the concept. “At one of FCM’s Sustainable Communities Conference we met Doug McKenzie-Mohr, the leading expert in CBSM principles. We’ve worked with him ever since.”

RELATED AND FUTURE INITIATIVES

Greater Sudbury is working aggressively on a strategy to attract environmental businesses to a new eco-industrial park. Mr. Graham gave the example of recycling companies. “What most municipalities do with plastics, for example, is collect them and then ship them elsewhere for recycling so the economic benefit is accrued in some other location. We want to retain some of those materials here and attract a company that can recycle them locally.” The city is also concluding negotiations with private sector partners to develop a biodiesel production plant, which will be the first tenant of the eco-industrial park.

Similarly, Greater Sudbury’s proposed biogas project will also attract new business to the area and create jobs. Municipal sewage sludge would be used to produce methane as an alternative energy solution. “The energy we create from biogas would also attract other businesses that want to relocate because it would provide long-term stable energy prices,” Mr. Graham explained. “Knowing the price of heating and cooling for a 20-year time frame is an appealing future.”

In addition, the Sudbury District Heating Corporation (a partnership between the city and Tormont Industries) launched Greater Sudbury’s first district heating system in 2000. The system generates five megawatts of electricity through natural gas generators and heat recovery technology. A six-megawatt project has also been developed for the Sudbury Regional Hospital.

Greater Sudbury also wants to develop a program to roll out the Government of Canada’s One Tonne Challenge. “We see that as an integrated program that will combine an entire portfolio of initiatives so that, when we do home visits (audits) we’re not just talking about energy reduction,” said Mr. Graham.

A full cost recovery of wastewater services was introduced on July 1st, 2001, which will help promote water conservation and enable the city to sustain this essential infrastructure and take advantage of government grants for water and wastewater projects.

Greater Sudbury has also received grants from the Green Municipal Funds (GMF) for a variety of other sustainable development projects. For example, the city’s *Strategic Energy Audit and Retrofit Plan* will audit all 175 municipal facilities and provide retrofit options. The aim is to reduce energy costs by 30 per cent over all, for an annual savings of about \$610,000 and a reduction of 11,000 tonnes of equivalent CO₂ annually. The GMF is also helping Greater Sudbury develop a comprehensive waste management plan that will include waste diversion, decreased emissions from collection vehicles, and landfill gas utilization.



PARTNERS AND COLLABORATION

Internal

Economic Development & Planning Services
Public Works

External

93 community, business, and government partners, some of these include:

- International Council for Local Environmental Initiatives
- Federation of Canadian Municipalities
- Government of Ontario
- Natural Resources Canada
- Laurentian University
- Science North
- Inco Limited
- Falconbridge Limited

PROMOTIONAL ACTIVITIES

City council was regularly updated on the plan's progress. Local radio stations provided ongoing coverage through a series of advertisements, and the city released success stories to print media along the way. Two EarthCare Sudbury inserts were also included in the local community newspaper.

EarthCare Sudbury partnered with Science North—a science centre and visitor destination for Northern Ontario—to develop a climate change “show” to raise awareness in the community. This multi-media object theatre is an appealing and effective discussion piece on climate change and its impacts and empowers visitors to take action. A travelling road show version will be showcased across Canada and the U.S., and in 2004–2005 a permanent version will go to the California Science Centre in Los Angeles.

EarthCare Sudbury worked closely with Laurentian University to obtain funding to establish the Climate Change Impacts and Adaptation Research Network (C-CIARN). C-CIARN is part of a national network with five regional offices across Canada. The funding will help the university bring researchers and stakeholders together to address key climate change issues.

EarthCare Sudbury also works with Greater Sudbury's local school boards, colleges, and universities to introduce sustainability issues into all levels of learning. The partners are now developing a public education and outreach strategy for the entire community, which will list a number of the actions identified in the plan.

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Additional Web sites:

EarthCare Sudbury: www.city.greatersudbury.on.ca/earthcare



SUSTAINABLE COMMUNITY PLANNING



Local Action Plan for Addressing Energy Management & Greenhouse Gas Emissions

Population: 8,200
permanent; 30,000
equivalent including tourists

SUMMARY

The Banff Local Action Plan aims to reduce the impacts of increased tourism on this national park community by mobilizing the municipal and private sectors and the community to take action to reduce energy consumption. From energy use and emissions inventories, the Town of Banff forecasted that as much as \$20 million per year in energy costs could be retained within the community by 2020, money that now leaves the town without being spent on the local economy. The town also evaluated how energy consumption across all sectors affects economic, social, and environmental issues. The plan was integrated with the town's corporate ISO 14001-compliant environmental management system, which will help to prioritize new practices that result in greater energy efficiency in the community.

BACKGROUND

As a national park community and part of a World Heritage site, the Town of Banff must balance the needs of its small population of permanent residents with the thousands of tourists who visit each year. Historically, Banff had a "shoulder season," with fewer visitors in spring and fall, but that has changed. "We still have peaks in the summer and during festive holidays over the winter, but our season is essentially year round now," said Jake Pryor, the town's environmental manager.

Population spikes affect how much energy the town uses. A limit of 40 megawatts (MW) of electricity coming up through the Bow Valley serves the town, three ski hills and the community of Lake Louise. "We're creeping closer to that limit every year," said Mr. Pryor, noting that any upgrades to the electricity system would have significant environmental and visual impacts. Previous approaches, however, had fragmented energy issues and pitted them against other environmental, economic and social needs.

The town therefore had two ways to deal with the issue: increase energy supply or reduce energy demand.

PROJECT DEVELOPMENT

In 1999, the town joined FCM's Partners for Climate Protection (PCP) and learned how it could better manage the energy needs of the community using the PCP framework.

An energy consultant prepared energy use and emission inventories, a process that took a year to complete. Results demonstrated how community-wide energy costs would double from about \$51 million in 2000 to over \$100 million by 2020 if the town adopted a 'business as usual' scenario. "Looking at the cost of energy is enlightening," said Mr. Pryor. "All but a small portion leaves the community and, aside from keeping warm and keeping the lights on, there are no other community benefits."

The findings were presented to town council which, as a result, set aside the resources needed to achieve PCP Milestone Three, the local action plan stage. "When an organization like FCM comes out with this kind of program councillors listen and appreciate that it's coming from a credible source," said Mr. Pryor.

The next phase involved hiring a communications consultant to help the town conduct a series of workshops and meetings with municipal staff, community residents, and the business community. The information gleaned in this stage helped the town decide on a range of municipal and community-wide actions to include in the local action plan.

PROJECT DETAILS

Consultations began in the fall of 2001. Workshops with municipal staff resulted in a building retrofit program and a list of other actions that the town itself could take to make the delivery of municipal services more energy efficient.

At community workshops, residents identified, then selected which initiatives they concluded were the most important, taking into account all the resources required for implementation and the potential benefits. In essence, residents used a triple bottom line of economic, environmental, and social factors to prioritize initiatives.

While historically, environmental issues were considered in isolation from other factors, the progressive, holistic approach used with residents was reiterated with the business community at a well-attended event sponsored by the Banff Park Lodge. Mr. Pryor explained that, as a well-respected hotel, the Lodge's endorsement of the process was crucial in making it credible to the rest of the business community.

"The business community is very conscious of the volatility of energy prices, so we asked them to consider how they could reinforce the local economy by exploring energy efficiency as a business development opportunity," said Mr. Pryor. Some opportunities include materials, technologies and expertise that will be needed locally and which could jump-start several new markets.



The town is less than three years away from ‘build out,’ (the limit on the permanent population and the amount of available commercial square footage) so its focus will be on redevelopment over the next few years. To address that challenge, the town developed a set of Green Site and Building Guidelines, a catalogue of energy management and other measures that reduce energy use, and held an open house with developers in May 2004 to see how those guidelines could be incorporated into the town’s land use bylaw.

Finalized in the summer of 2003, the local action plan includes a listing of all existing community-wide and municipal initiatives, while proposed measures are divided into four areas:

1. *Go for Green* to increase the use of sustainable and active transportation through carpooling, compressed work-weeks for municipal staff, and making the community more bicycle- and pedestrian-friendly.
2. *Alternative Fuels & Renewable Energy* to purchase more “green” energy, to use alternative fuels in vehicles, and to promote distributed energy opportunities.
3. *Energy Saver Buildings*, a retrofit initiative for municipal, residential, and commercial buildings.
4. *Energy Efficiency Education & Services* to provide energy-efficiency products to the community, to launch an anti-idling campaign, and to create a revolving fund out of energy savings that can be invested in other environmental initiatives.

All these initiatives include a timeline, roles and responsibilities, cost, and emission reduction potential.

The local action plan complements the Banff Community Plan, the town’s Environmental Stewardship Policy, Parks Canada’s Banff National Park Management Plan, and is integrated into the town’s corporate ISO 14001 (International Standards Organization) Environmental Management System (EMS).

Similar to the PCP process, ISO 14001 provides a framework that records objectives and targets, sets forth actions and responsibilities. The EMS formalizes the responsibilities outlined in the local action plan and provides a corporate accountability framework to get things done. The EMS can then be certified by an independent audit. “Using the ISO 14001 platform will ‘future proof’ us so that, when the time comes for EMS certification, we’ll be ready,” said Mr. Pryor.

“There are a handful of communities that have reached PCP Milestone Three but they’re not sure what they’re going to do with their plan because things tend to get implemented on an opportunistic basis which means some priority actions can fall through the cracks,” said Mr. Pryor. “By tying the local action plan to the EMS you get to both preplan and capitalize upon the opportunities at the same time.”

Council adopted the local action plan in September 2003. “Here in Banff we emphasize that it’s a path we’re taking, not a destination to reach,” said Mr. Pryor. “We listen to people, figure out who has the ability to do what, then reframe the issues so that everyone has a role to play. Share the responsibility!”

RESULTS

- Greenhouse gas emissions from municipal operations are expected to decrease from 6,660 tonnes (1990 levels) to 4,600 tonnes by 2009 as a result of the plan’s initiatives.
- The plan includes a monitoring and evaluation strategy to track progress project-by-project.
- The plan aims to retain up to \$20 million in the community by 2020 through energy reduction initiatives. “That money will be available for other business transactions and will not simply leave the community in energy costs,” said Mr. Pryor.
- The town has incorporated solar energy in its operations building. Other energy management opportunities include small cogeneration or microturbine projects that could be used in hotels for heating and air conditioning.
- The town’s municipal buildings program shows that by completing over \$400,000 in retrofits it will save \$70,000 a year in energy costs. The local action plan recommends that these yearly savings be used to create a revolving fund to implement other environmental projects.

LESSONS LEARNED

- **INVOLVE THE BUSINESS COMMUNITY AND RESPECT THEIR NEEDS.** Holding a lunch-time meeting worked well for the busy business owners who participated. A well-respected hotel also sponsored the event, which helped make the process more credible. All the largest energy consumers attended including hotels, the Banff Centre, and Mineral Springs Hospital.
- **POLITICAL INVOLVEMENT SPEAKS VOLUMES.** At the business meeting, the mayor and three councillors attended. “That means a lot to the business community to see their elected officials supporting a particular process,” said Mr. Pryor. “They made a concerted effort to make it a mainstream economic issue.”
- **PROVIDE GENUINE COMMUNITY ENGAGEMENT OPPORTUNITIES.** Banff is characterized by a high turnover rate in population as people come and go for jobs, depending on the season. “With so much rented property a lot of people can feel disempowered about what they can and can’t do to be more efficient,” said Mr. Pryor. All residents were invited to join the workshops and provide their ideas and feedback. “You learn a lot about your



community by doing this, not just in terms of numbers but their motivations, their willingness to pay for certain things, and what they are personally committed or able to do.”

- **Leverage the community’s strengths.** The town expects to use the energy savings from its building retrofit program for other environmental projects, demonstrating how short-term investments can be plowed back into the community for long-term benefits. There is also a role for the thousands of tourists who visit Banff each year. “We can leverage the influence of tourists by having Park Radio talk about the things that we are doing. That helps inform tourists and generates marketing opportunities for businesses,” said Mr. Pryor.

RELATED AND FUTURE INITIATIVES

In 2005 the town will begin its five-year review of the *Banff Community Plan* and Mr. Pryor believes that the local action plan indicators will be very useful during that process. “We’ll be able to see the current state of the community, how it will evolve in future, and help us prioritize our resources,” he said.

The town purchases electricity for its municipal operations through an agreement brokered by the Alberta Urban Municipalities Association (AUMA). Twenty per cent of the total purchase is “green” energy—electricity generated through renewable means. A community initiative identified in the plan involves “bulk buying” whereby community-related organizations can join the town’s aggregated agreement to benefit from bulk-purchase pricing.

In this and other proposed initiatives, the town considered emission reduction credits (ERCs) as part of the payback. The GHG reductions resulting from green energy purchases could be sold as credits in an international emission trading system, estimated at \$10 per tonne. By 2006, the town estimates that it would be eligible for \$6,000 in credits for every 10 per cent of its electricity purchases in green power.

With financial assistance from FCM’s Green Municipal Funds, Banff is also planning to construct nutrient-removal facilities as part of an upgrade to its wastewater treatment plant. The upgrade would allow the plant to remove phosphorus and ammonia as nitrogen, greatly reducing the amount of chemicals left in treated wastewater that is discharged into the Bow River. Parks Canada has asked the town to demonstrate environmental leadership by setting tougher standards for nutrient removal than the ones that the Alberta Environment Ministry currently requires. The study will explore technical options to achieve much higher standards to protect the environment in a national park setting.

PARTNERS AND COLLABORATION

Internal

Environmental Management

External

Banff Park Lodge
 Banff/Lake Louise Hotel Motel Association
 Federation of Canadian Municipalities
 Canada Mortgage and Housing Corporation
 Parks Canada
 The Sheltair Group Resource Consultants Inc. (Vancouver)
 Praxis Inc. (Calgary)

PROMOTIONAL ACTIVITIES

The community was engaged through a series of interactive workshops that educated them on the results of the energy and emission inventories and provided an opportunity for feedback and suggestions. Municipal staff and council were engaged in each step of the consultation process. In addition, Park Radio recorded the consultation sessions and created information pieces that they aired regularly.

Leaflets were mailed to every household, and community posters and local newspaper articles also informed the public about the plan’s progress. The town’s Web site contains the results of the consultation process and copies of the local action plan.

CONTACT INFORMATION

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Web site: www.town.banff.ab.ca (the local action plan can be found by clicking on “Special Initiatives”)

Additional Web sites:

Alberta Urban Municipalities Association:

www.munilink.net/main.asp

Canada Mortgage and Housing Corporation:

www.cmhc-schl.gc.ca

The Sheltair Group Resource Consultants Inc.:

www.sheltair.com

Praxis Inc.: www.praxis.ca

You can also download a copy of Banff’s local action plan from FCM’s Sustainable Communities Knowledge Network at <http://kn.fcm.ca>. Click on Partners for Climate Protection, then Municipal Participation.

SUSTAINABLE TRANSPORTATION

Ribbon of Steel—A Multi-use Trail and Streetcar Corridor

Population: 666,000

SUMMARY

The City of Edmonton converted abandoned CP Rail lands into an aesthetic and vibrant corridor to promote increased physical activity and to manage inner city traffic volumes. The *Ribbon of Steel* is a multi-modal transportation corridor that serves the city's downtown core. It includes a multi-use trail for pedestrians and cyclists, a historic streetcar runs parallel to the trail, and there is access to the underground light rail transit station. It connects to existing trail systems at either end, notably Edmonton's busiest non-motorized transportation corridor, which has more than 1,100 active transportation crossings per day for nine months of the year. Installed lighting complies with the RCMP's *Crime Prevention through Environmental Design* principles and 25 per cent of daily traffic volumes on an intersecting roadway have been rerouted away from the corridor.

BACKGROUND

The City of Edmonton has been active on many sustainable development fronts over the past decade. From a landfill gas capture and use project, to local action planning, the city is proud of its record on environmental protection. The city won an honourable mention from the 2003 FCM-CH2M HILL Awards for its *Integrated Waste Management System* and has also been a participant in FCM's Partners for Climate Protection (PCP) since 1995.

In 1999, the city approved its *Transportation Master Plan (TMP)*, which supports a balanced transportation system for cyclists, pedestrians, public transit, and automobiles. The plan augmented several other strategies developed by the city, such as the *Bicycle Transportation* and *Capital City Downtown* plans.

These latter plans had identified a section of abandoned Canadian Pacific (CP) Rail lands as a potentially important active transportation corridor. The corridor is bound by apartment buildings, commercial properties, and parking lots, and runs along the edge of the city's downtown.

"A lot of people choose not to go downtown and pay for parking, so the corridor would give people the option to walk or ride downtown," said Claire Stock, one of the city's transportation engineers.

In addition, rehabilitating the lands for active transportation would help to revitalize the urban core and extend the infrastructure for a historic streetcar that now runs parallel to the multi-use trail.



CITY OF EDMONTON, ALBERTA

PROJECT DEVELOPMENT

One of the goals of the TMP was to develop non-motorized transportation facilities along abandoned and active railways and utility rights-of-way. A citywide 62-kilometre multi-use trail corridor network and implementation strategy was prepared; the Ribbon of Steel is the most critical connection.



In mid 2000, the city initiated a strategic planning study to review and design an active transportation corridor on the abandoned CP Rail lands. The study included a full geotechnical review of the area, environmental testing, and cost estimating, followed by more detailed concept level design development.

The city's project team presented the study's findings to city council in 2002. "We had two councillors from the ward where the corridor is located who had been very active throughout the project," recalled Ms. Stock. Following review and recommendation by council's transportation sub-committee, council immediately approved the plan. "It wasn't even discussed, it went straight through."

Prior to its development, a grid network of roadways, the underground Light Rail Transit (LRT) and public transit buses serviced the area. Heavily used trails on Edmonton's High Level Bridge and through Railtown (a mixed-use commercial/residential development) finished at either end of the corridor. Due to a number of one-way streets and a busy arterial road, trail users were left stranded between the trail systems and the downtown.

Running along a short segment of the former rail corridor was a historic streetcar, operated by the Edmonton Radial Railway Society, a volunteer organization. The *Ribbon of Steel*—so named to pay homage to the area's rail history—would widen the corridor and provide the necessary infrastructure to accommodate safely the extended streetcar service and a multi-use trail.

Construction began in May 2003 and was finished that October.

PROJECT DETAILS

The *Ribbon of Steel* is a multi-modal transportation corridor that connects to two existing trails, one at each end, and to one of the city's LRT stations. The asphalt trail is multi-use, providing a smooth pathway for pedestrians, cyclists, and inline skaters alike. Plazas were constructed to serve the streetcar line, and new lighting and landscaping was introduced. In addition, two of the city bus routes that serve the area provide racks that carry bicycles.

"People are happy to have the link because it's an attractive alternative to travelling on roads," said Ms. Stock. She explained that, prior to the trail's construction, people often had to get on and off the existing trails and this was especially inconvenient for cyclists.



CITY OF EDMONTON, ALBERTA

The city believes that developing a network of multi-use trails, free of automobiles, is a modern approach to transportation and recreation. The trail corridors are the equivalent of arterial roadways, a dedicated system that connects all areas of the city to the downtown and to the North Saskatchewan River Valley. The *Ribbon of Steel* is the central connection between north and south Edmonton.

The trail had to be integrated with the surrounding roadway network, resulting in several changes to traffic operations that gave priority to trail users and the streetcar. For example, on the one intersecting roadway a zebra crosswalk was installed and a heavily used left turn onto the roadway removed. The same roadway also underwent a “road diet” where three narrow traffic lanes were reduced to one in each direction.

The *Ribbon of Steel*'s design standards exceeded the guidelines suggested by the Transportation Association of Canada. For example, prior to construction, the grade on one of the trail-to-road connections was very steep and would effectively bar access by persons with a disability. The project team designed the grade at five per cent, below the disabled access guidelines of eight per cent. Although this meant considerable excavation to install a 60-metre long retaining wall, the trail is now readily accessible to all residents.

Safety was also a major feature of the design. The city commissioned an independent safety audit, and followed the RCMP's *Crime Prevention through Environmental Design* principles to ensure adequate lighting along the corridor. Light pollution had been identified as an issue in the area, so the new light standards are covered, directing all light downward.

The *Ribbon of Steel* has been operating for only a year, but area businesses are already seeing the benefits of increased foot and bicycle traffic. “There are at least two restaurants that back on to the corridor that are planning to put in patios,” Ms. Stock reported. One developer is also planning to turn a parking lot into a mixed-use commercial and residential site. The market value of residential apartments along the corridor is also expected to increase.

Although health benefits are often difficult to quantify, the trail gives thousands of Edmonton residents the chance to be more active. An increased number of residents are using the corridor to commute downtown and, for their “mental health,” many office workers in the area enjoy the corridor during lunch breaks. “We even had a company that contacted us that wants to put in a memorial bench for one of their employees.”

The Edmonton Radial Railway Society has also benefited. As a key partner, the project gave them a higher profile and the opportunity to educate residents about Edmonton's history.

The total project cost was \$2.3 million, with one-third coming from each of the federal, provincial, and municipal governments.

Most of the funding was spent on widening the corridor to accommodate the trail and new streetcar rails, with approximately \$350,000 spent to conduct the geotechnical surveys and to develop the trail design.

“We were faced with the problem of not enough funding,” Ms. Stock said, “so we had to scale back some things. But now that the main features are in, more can be added at a later date.”

RESULTS

- Construction was completed in October 2003, so preliminary usage levels at the time the FCM-CH2M HILL Sustainable Community Award was announced were based on winter conditions. One of the existing trails that connects to the *Ribbon of Steel*, however, is one of the busiest cycling and pedestrian routes with over 1,100 crossings per day most of the year. City officials expect higher volumes of users and will be monitoring usage levels over the course of 2004.
- Before construction, the two existing trails in the area were unconnected. Inline skaters had to use narrow sidewalks and cyclists were restricted to on-road routes on one-way streets. The *Ribbon of Steel* eliminated the need to cross two roadways by utilizing a road closure and an underpass from the former railway operations.
- Roadway modifications rerouted 25 per cent of daily traffic volumes from an intersecting roadway, and lane sharing between cyclists and motorists on that roadway has improved.
- The complexity of the project challenged all staff associated with the project. City staff noted that roadway designers enjoyed the innovative work and realized that designing for cyclists and pedestrians can be as detailed and intricate as for motorized vehicles. The construction staff were also exposed to new techniques and thus expanded their expertise.

LESSONS LEARNED

- **STRATEGIC LAND USE PLANS AND POLICIES ARE CRITICAL.** Ms. Stock said that having the various strategic plans already in place gave the project team the leverage they needed to complete the project. Because of those plans, it was recognized that the *Ribbon of Steel* was a critical component of the city's long-term trail network and the lands were protected accordingly.
- **STUDY EXISTING TRANSPORTATION NETWORKS FOR OPPORTUNITIES.** Many municipalities have abandoned rights-of-way or utility corridors that could be used for similar trail projects. “In Alberta, we have lots of oil pipeline corridors for example that are informally used by cyclists and pedestrians, so you have to consider all of the land's uses,” said Ms. Stock.



- **CONSIDER ALL THE POTENTIAL USERS.** The city took great effort to ensure that persons with disabilities had access to the trails. However, Ms. Stock reported that the city did not actively incorporate any measures for children. “It would have been good to have some seating areas just for them, or things to play with.”
- **MAKE IT FUNCTIONAL AND AESTHETICS WILL FOLLOW.** The city’s immediate goal was to make the trail functional for all. As funding becomes available, other amenities, such as interpretive and historical panels and more landscaping will be added.

RELATED AND FUTURE INITIATIVES

The city continues to work on completing the full 62-kilometre multi-use trail corridor network. It plans to extend the southern trail corridor in 2006, which would link the downtown to a popular shopping and entertainment district. To the north, further development on lands owned by a private institution is in the planning stages and will include trail connections along the municipal easement.

To promote the *Ribbon of Steel*, the city will design new maps to show all of the trail connections. This will likely be done in conjunction with the city’s Community Services department, responsible for parkland and community issues.

In the fall of 2004, the city will revisit and update its *Bicycle Transportation Plan* and prepare a *Pedestrian Transportation Plan* to complete missing links in its sidewalk inventory.

Early in 2003, Edmonton completed its local action plan, through its arms-length organization, CO₂RE. With funding from FCM’s Green Municipal Funds (GMF), the city completed GHG and energy use inventories as part of its commitment to PCP, and has now set out the deliverables for a community-wide action plan. These deliverables focus on improving energy efficiency, introducing alternative fuels and new municipal policies that would support these types of actions. This accomplishment marks Edmonton as one of the first Canadian municipalities to complete milestone Three of PCP’s Five Milestone Framework.

The city has also gained an international reputation in the field of waste management. In 2003, for example, the city won an honourable mention in the FCM-CH2M HILL Sustainable Community Awards for its *Integrated Waste Management System* and, with a grant from GMF, is now studying how to recover energy from its existing solid waste composting facility and materials recovery facility. In addition, the city has partnered with a consortium of academic, industry, government, and research partners, to build a waste management Centre of Excellence. The centre will provide researchers from around the world with laboratories to test new ideas, from composting methods and recycling equipment, to sociological studies on behaviours in waste management.

Edmonton has received several grants and loans from GMF for several other projects. These include: a project to wash and reuse sand used on city streets in winter, which will reduce waste going to landfill; a study to determine how waste heat from melted snow, removed from city streets, could be used as a source of cooling; a study to assess options for removing ammonia from its wastewater treatment plant; and a study to determine the effectiveness of constructive wetlands for treating urban stormwater runoff.

PARTNERS AND COLLABORATION

Internal

Transportation & Streets
 Planning & Development
 Community Services
 Asset Management & Public Works

External

Infrastructure Canada-Alberta Program
 Edmonton Radial Railway Society

PROMOTIONAL ACTIVITIES

Municipal staff attended several community association meetings in the neighbourhoods adjacent to the corridor to provide residents with information about the project and to gain their feedback. The design proposals were also presented at two public open houses.

Presentations were made to the Downtown Advisory Board and concept plans were provided to the board’s Urban Design Review Panel to ensure that the project was compatible with their initiatives.

Ongoing communication occurred between the city and the Edmonton Radial Railway Society, and roundtable discussions were held with interested stakeholder groups such as Alberta TrailNet, the Running Room, the Cyclists’ Advisory Committee, and Community Greenways. The project was also promoted through radio, in community newsletters, and in daily newspapers.

CONTACT INFORMATION

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 Edmonton Radial Railway Society:
www.edmonton-radial-railway.ab.ca
 CO₂RE: www.co2re.ca



Pollution Prevention and Control Plan

Population: 114,000

SUMMARY

An expanded sewage treatment plant in the City of Thunder Bay will virtually eliminate pollutants from treated effluent. As part of the city's Pollution Prevention and Control Plan, the facility uses biological aerated filtration to provide secondary treatment and a nitrification process to substantially eliminate ammonia from the treated effluent. Ultraviolet disinfection is being introduced to eliminate chlorine. These works were funded through a user pay sewer rate system and a grant from the Canada Strategic Infrastructure Fund. Thunder Bay is the first Northern Ontario municipality to introduce electricity cogeneration using sludge gas generated by treatment processes, which eliminates the waste of surplus gas and reduces the need for natural gas. The city also set water conservation targets for the next 15 years and has approved a goal to generate a reserve fund of \$10 million—through the user pay system—over the next seven years, once the \$91 million plan is completed.

BACKGROUND

The City of Thunder Bay, located at the head of Lake Superior, has been very proactive over the years with respect to water source protection, winning numerous awards for its water conservation initiatives. Even the city's logo, *Superior by Nature*, attests to the priority it places on environmental protection. Since 1997, the city has also been a participant in FCM's Partners for Climate Protection.

Lake Superior is the cleanest of the Great Lakes, but in the mid to late 1980s Doug Scott, the city's manager of engineering, reported that there were some "shocking examples of water and air pollution from industry."

These examples, among others, helped spur both Canada and the United States to sign an agreement in 1986 to protect water quality in the Great Lakes. The agreement committed both countries to work on action plans to address problems in 43 "areas of concern," so named because the areas contained contaminated sediment, inadequately treated wastewater, non-point source pollution, or degraded habitat. Thunder Bay was identified as one of these areas.

PROJECT DEVELOPMENT

By the 1990s, the city's wastewater treatment plant provided primary sewage treatment and phosphorous removal, enough to meet provincial regulations. The Province of Ontario's Municipal Industrial Strategic Abatement Program had, however, targeted Thunder Bay for the addition of secondary treatment over the next 15 years.

The cost of introducing secondary treatment was formidable—an estimated \$80 million—but its implementation would remove up to 95 per cent of suspended solids and biological oxygen demand (the demand on oxygen in the water caused by organic material). At that time, and until May 2004, there has been no requirement by the province to use a nitrification process to remove ammonia. The city knew that it would eventually need to upgrade its facilities and so, in 1990, city council introduced a sewer surcharge on water rates. The surcharge would create a reserve fund that would finance the additional facilities.

"It was one of the best things city council did," said Mr. Scott. "Before that, the costs were borne by property taxes. The reserve fund now pays for all capital and operating costs for the sewage collection and treatment system and it's meant that we've only had to increase water rates by about five per cent every year."

In 1993, the city formed a partnership with the federal and provincial governments under the Great Lakes 2000 Cleanup Fund to develop its *Pollution Prevention and Control Plan* (PPCP). The plan recommended the addition of secondary sewage treatment processes and improvements to combined sewer overflows and to trunk sanitary sewers to eliminate sewage overflows into nearby rivers and into Lake Superior. These works also greatly reduced the likelihood of basement flooding, which had been common in wet weather.

In 1995, a State of the System Report was finalized that determined the extent of contamination of Lake Superior and other tributaries from municipal discharges. Recommended measures to reduce contamination were made and pilot studies conducted to determine the most appropriate technology for the new sewage treatment facilities.

The PPCP was approved by city council in 1999. Several more years passed before the city had the funding required to implement its pollution prevention initiatives fully.



PROJECT DETAILS

The key elements of the city's PPCP are:

1. Collection system management, including manhole and closed circuit television sewer inspections (commenced in 1993).
2. A program to reduce the extent of the city's combined sewer system (commenced in 1993).
3. Upgrades to combined sewer overflows to reduce overflows and prevent the discharge of solids.
4. New trunk sanitary sewers to eliminate overflows.
5. Secondary sewage treatment at the city's wastewater facility.

With a planned budget of \$56 million over the next 10 years, city council approved the PPCP in 1999. In 2003, the city applied for and received \$25 million in funding under the Canada Strategic Infrastructure Fund to help complete the planned upgrades and enhance the treatment facility by:

- adding a nitrification process that would substantially eliminate ammonia from treated effluent prior to its discharge to the Kaministiquia River (near the river's mouth at Lake Superior);
- converting the existing chlorine gas disinfection system to an ultraviolet system to eliminate chlorine; and
- adding facilities to generate electricity from the gas generated by the treatment processes.

Thunder Bay is the first Ontario municipality to use biological aerated filtration for municipal wastewater treatment, according to Degrémont, the Quebec water treatment engineering firm that built and installed the system. Mr. Scott explained how the system works. Water and sewage is pumped into tanks that are filled with crushed kiln-fired clay and a biological film grows on the surface. Bacteria thrive in the film. These millions of "bugs" consume much of the organic matter in the sewage and virtually eliminate ammonia from the treated effluent.

Although using closed circuit TV to inspect sewers is a relatively common practice, the city upgraded its computer software to allow staff to assess the entire system and to prioritize upgrades and cleanings. Not only does this help the city keep abreast of sewer conditions, it helps in planning road reconstruction. "With the system we will be able to integrate the rehabilitation of our sewers with the rehabilitation of roads and watermains. This makes our overall asset management program more cost effective," Mr. Scott explained.

The PPCP also includes changes to the city's operations, such as more frequent cleaning of catch basins, regular cleaning and flushing of sewers where solids can build up, and training programs for its staff.

Water conservation initiatives are also a critical factor to reduce flows in the system and to reduce the cost of sewage collection

and treatment. Other improvements to the water system will decrease excessively high pressures in the overall system, which will reduce water lost through breaks and leaks. The city works closely with EcoSuperior, a local non-profit organization, which provides a host of conservation initiatives, such as rebates for low flow toilets and rain barrels, and free water audit services. Mr. Scott also reported that the city will begin a water conservation program that targets the industrial and commercial sectors later in 2004.

The city has already incorporated some of the best practices found in the National Guide to Sustainable Municipal Infrastructure, a publication produced by the National Research Council and the Federation of Canadian Municipalities. "We're still digesting a lot of it," said Mr. Scott. "We've assigned project engineers to review the chapters and give us their conclusions on what we should be doing differently."

Construction of the new sewage treatment facility is about one-third completed. City council has set a goal to complete all components of the PPCP within seven years and generate a reserve fund of approximately \$10 million over the same period.

It is a testament to the city that a wide array of government, business, and community organizations reviewed and supported the PPCP. Some of those groups include Fisheries and Oceans Canada, the Ontario Ministries of the Environment and Natural Resources, the North Superior Training Board, the Thunder Bay Remedial Action Plan Public Advisory Committee, the North Shore Steelhead Association, Ontario Healthy Communities Coalition, and the Thunder Bay Chamber of Commerce.

The city's accomplishment is that much more impressive considering that it is, in fact, not even required to provide secondary treatment. In a letter of support, the Ontario Ministry of Environment applauded the city's plan, stating that it "demonstrates a strategic shift in going beyond compliance. Once the plan is complete, the city will be looked upon as a leader in environmental protection at the municipal level throughout North America."

RESULTS

- With the expansion of the sewage treatment plant eliminating most pollutants, Thunder Bay should be removed as an area of concern by the end of 2004 or early 2005.
- All chlorine and almost all ammonia have been eliminated from treated effluent.
- The sewer surcharge will generate a reserve fund sufficient to finance all aspects of the PPCP and create additional reserve funds for future needs.



CITY OF THUNDER BAY, ONTARIO

- Virtually all basement flooding has been eliminated and there has been a substantial decrease in sanitary and combined sewer overflows during wet weather.
- The city won the 2003 Ontario Water Works Association award in recognition of its comprehensive water efficiency program.

LESSONS LEARNED

- **BE PROACTIVE, NOT REACTIVE.** In the past, the city operated under a *status quo* approach of simply meeting provincial regulations without looking further ahead. “Broader planning must be done sooner so that you don’t have sudden surprises,” said Mr. Scott. In particular, he cited the reserve structure that the city set up as a tremendous benefit in helping to provide sustainable financing.
- **MAKE ASSET MANAGEMENT A PRIORITY.** Transportation & Works (the department responsible for the PPCP) has set the standard for the city with this project and has influenced how other departments view asset management issues. For example, the city’s Parks & Recreation department is now reviewing the condition of all its buildings and identifying what upgrades will be needed. “Using asset management, you can plan upgrades in a way that will avoid any spending surprises.”
- **BIG PROJECTS NEED BIG MONEY.** Mr. Scott said that, these days, it is almost a certainty that large infrastructure projects will require some level of funding from senior governments and that municipal governments should be prepared for what can be a lengthy funding process.

RELATED AND FUTURE INITIATIVES

As part of the upgrade to its wastewater facility, the city plans to introduce technology that will generate electricity using the sludge gas (methane) that is generated by the plant’s wastewater treatment processes. Methane has 21 times the global warming potential as carbon dioxide. A consultant has been retained to design the plant and early estimates reveal that the city could save as much as \$400,000 a year in electricity costs by using the surplus gas. The city also hopes to earn carbon credits under the Kyoto Protocol.

In 2001, the city enacted a sewer use control bylaw to ensure that pollutants that cannot be treated at the wastewater plant are kept out of the sanitary sewer system. The city is researching similar bylaws in other Canadian municipalities and abroad and will update its bylaw if warranted.

“We’re also considering tapping the methane gas in our landfill,” said Mr. Scott. The City of Greater Sudbury made a presentation to the city in May of 2004 on how they plan to capture landfill gas and use it for heat and to generate electricity. “One of their ideas is to try and attract new industrial development, particularly those with large amounts of waste. The benefits of low-cost waste handling and lower cost energy may prove to be a major incentive towards industrial development.”

PARTNERS AND COLLABORATION

Internal

Transportation & Works Department

External

Ontario Ministry of Environment

Environment Canada

Thunder Bay Remedial Action Plan, Public Advisory Committee

Infrastructure Canada

EcoSuperior Environmental Programs

PROMOTIONAL ACTIVITIES

The funding from Infrastructure Canada, confirmed in August 2003, produced a flurry of articles in local newspapers about the project. These included articles in *The Chronicle-Journal* (the city’s daily newspaper), *This Month*, the city’s monthly report to the citizens of Thunder Bay, and news releases and backgrounders from both the city and the Government of Canada.

CONTACT INFORMATION

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WATER

Official Plan Amendment: Rouge North Management Area

Population: 209,000

SUMMARY

An amendment to the Town of Markham's Official Plan aims to protect, enhance and expand the 4,700-hectare Rouge Park, its tributaries and its watershed, as well as increase forest land and vegetation cover to support the town's commitments to clean air and greenhouse gas (GHG) emission reductions. A number of stakeholder meetings resulted in 10 ecological criteria that are applied to all new land use developments to determine the Rouge Park boundaries. Criteria are based on specific characteristics of the watercourse that enhance the link to other watercourses and natural features. By using a scientific approach, the town can protect all Rouge River watershed tributaries, while new urban development guidelines help developers and communities integrate the park as a community design feature.

BACKGROUND

Over the past several years, the Town of Markham has gained a reputation for sustainable community planning. In 2003, for example, it won an FCM-CH2M HILL Award for its *Markham Performance Measures Document*, a compendium of environmental, design, transit, and pedestrian supported criteria that helps staff, the community and developers assess development proposals. The document, now a part of Markham's 2003 Official Plan, will help the town build a more sustainable urban community.

The town joined FCM's Partners for Climate Protection in 2003 and has begun work on creating energy use and GHG emission inventories, the first milestone of PCP's Five Milestone Framework.

As far back as 1993, the town identified its commitment to environmental protection with the *Natural Features Study*, a framework and a series of targets designed to protect natural features and enhance vegetative cover. In 1995, the town joined the Rouge Park Alliance and supported a voluntary partnership to bring the Rouge Park north from its north Toronto boundary through Markham along the Rouge River tributaries. The town believed that this framework would create a higher standard of water protection while still allowing for appropriate growth and development.

PROJECT DEVELOPMENT

The 4,700-hectare Rouge Park was created in 1994 and includes forests, meadows, ponds, wetlands and beaches. It extends from Lake Ontario to the north Toronto boundary and, with a donation of land from the Province of Ontario in the spring of 2004, the Rouge Park is now the largest natural urban park in North America.



The Province of Ontario created the park's initial management plan, with the lands managed by a non-government organization called the Rouge Park Alliance (RPA). The Town of Markham was one of the RPA's first partners.



One of the objectives of this management plan was to extend the park north through the Towns of Markham, Richmond Hill and Whitchurch-Stouffville along the tributaries of the Rouge River to the Oak Ridges Moraine, while continuing to protect the ecological integrity of the park's resources. To meet that objective the RPA began development of what would ultimately become the *Rouge North Management Plan* in 1995.

In 2001, the RPA approved the final management plan, which included a number of recommendations to protect the park and its resources and to make it more publicly accessible. Town council subsequently approved the plan, in principle, in July of 2001 and directed its staff to work with the RPA to clarify some of the implementation measures recommended and to conduct additional public consultations.

Over the next two years, municipal staff, the RPA, and other community stakeholders and agencies refined the ecological criteria by testing them on a demonstration site in Markham. This allowed Markham to verify the incremental application process and demonstrated that the ecological criteria were reasonable and responded to and protected the specific site conditions of the watercourse. The plan's overall goal is summed up as follows:

To protect, restore and enhance the natural, scenic and cultural values of the park in an ecosystem context, and to promote public responsibility, understanding, appreciation and enjoyment of this heritage.

PROJECT DETAILS

The town's geography is characterized by a system of small drainage features and headwater streams in the north that feed into a system of larger creeks and rivers towards the south. "This is important to consider," said Lilli Duoba, the town's senior project co-ordinator for environmental planning. "More and more information has come to light over the last decade about the importance of these small headwater streams to the health and sustainability of the entire watershed system."

To protect the headwaters, therefore, the town and the RPA undertook three distinct steps:

1. Developed the Rouge North Management Plan using a partnership-based model with several stakeholders.

2. Established the 10 ecological criteria that support the objectives of the plan in consultation with the public.
3. Prepared the policies and the Official Plan Amendment to give the Rouge Park planning process statutory authority.

The management plan is the “blueprint” that guides the extension of Rouge Park North in order to create a continuous park along the Rouge River corridors. An outside consultant was hired to prepare the plan, in partnership with all government, business, and community stakeholders.

Since the park’s creation in 1994, existing town policies had allowed for a 10-metre buffer setback adjacent to watercourses through the development approvals process. But this policy merely created a uniform corridor that did not necessarily protect sensitive species or accommodate other land uses.

“It was an arbitrary standard,” said James Baird the town’s commissioner of development services. Some groups, he explained, wanted to increase the buffer to 30 metres, but this didn’t always make sense in the case of small streams that don’t follow a straight course, or which include significant vegetation or are linked to other natural features.

Instead, during the development of the management plan, the RPA took a science-based approach and adopted 10 ecological criteria that must be met in order to determine the buffer zone around any type of development. The criteria include such things as the existence of watercourses and floodplains, wetlands and other environmentally significant areas, habitats for threatened or endangered species, cultural and archeological resources, and forest conditions.

Ms. Duoba explained how the criteria work. “They’re applied one at a time and each criterion provides a layer or boundary. Once all the criteria are applied the widest line from the watercourse becomes the Rouge North boundary.” Each of the criteria recognizes the unique ecological characteristics of the river and stream corridors, while providing a means to protect, restore and enhance the natural ecosystem.

“There was quite a bit of tension and trade-offs throughout the process,” Mr. Baird reported. “But we believe we have the right criteria and have worked very closely with environmental groups and landowners to perfect them.” The criteria were tested on a demonstration site over a one and half year period. “The criteria did what we hoped to achieve in protecting the resources, while still allowing enough land for future development,” said Ms. Duoba.

Urban design guidelines that are compatible with the town’s other land use planning policies were developed as part of the management plan. “We have made a lot of progress in recent years in refining our community plans in areas adjacent to urban spaces,” said Mr. Baird. “We have been implementing the urban design guidelines in new communities and doing it consistently so that developers know the rules in advance.”

The project’s most important aspect, however, is the sheer number of people involved in the public consultation process. From third-party expertise, such as the Urban Development Institute, landowners, and the Toronto Region Conservation Authority, to a series of community, stakeholder and technical meetings, issues and concerns were addressed as they arose.

“It did take a considerable amount of time, but all the parties were at the table every step of the way,” said Ms. Duoba. Ms. Duoba also cited the support of town council as a major factor in the project’s success. “They took the issue very seriously and because we have a community that wants very high standards of protection, they really responded to the pulse of the community.”

On September 30, 2003 town council adopted the *Rouge North Management Plan* as an amendment to its *Official Plan*.

RESULTS

- The Rouge North Management Plan is a major structural element in the town’s overall land-use planning and environmental policies. It provides a major “green” corridor throughout the entire Greater Toronto Area, including the Oak Ridges Moraine, and is aligned with the town’s environmental goals.
- The ecological criteria allow the town to base its land use decisions on a series of real conditions and avoid the use of arbitrary buffer zones.
- An environmental land acquisition fund was set up to purchase certain priority sites within the park boundaries. “When the region’s transit was amalgamated into York Region Transit (in January 2001) this freed up \$2.4 million in funding as a compensation for our assets,” said Mr. Baird. This money was used to create the fund.
- The town and its partners have all funded projects that address restoration, rehabilitation, and erosion control of watercourses, some of which were undertaken at considerable expenses. The town expects a significant decrease in water resource impacts, which will also reduce costs, as a result of the plan.
- The plan’s policies will help increase the forest and vegetation cover, currently one of the lowest in the Greater Toronto Area, and support Markham’s ongoing commitments through its Clean Air Committee.
- The plan identified a number of programs and recommendations to guide long-term implementation. Examples include a Trails and Public Access Program, a Natural and Cultural Heritage Program, and a monitoring program.
- The process affected how senior levels of government view land uses in the area. The Province of Ontario, for example, will work with the RPA to study the entire watershed area, building upon the town’s work in order to create a corridor between Markham and Pickering. Transport Canada also owns thousands of acres of land that are associated with the



Pickering Airport and this work has influenced how the federal government will plan its future land uses.

- The town has won several awards for this project including a 2003 Federation of Ontario Naturalists award.

LESSONS LEARNED

- **ENGAGE PARTNERS EARLY IN THE PROCESS.** The earlier that all stakeholders are involved, the easier it is to pinpoint critical issues and reach consensus on a way forward.
- **BREAK ISSUES INTO SMALLER PARTS.** Since a project of this scope is an enormous undertaking it cannot be done effectively unless the various issues are broken down. “You really have to structure your teams and working groups effectively, and then apply an analytical process to deal with each issue,” said Mr. Baird. The town also concluded that with each meeting and stakeholder event the learning curve lessened and the community comfort level rose.
- **SCIENCE-BASED APPROACH ENSURED FAIRNESS.** Using hard data enabled the RPA to address stakeholder concerns in a fair and balanced manner, while still meeting its objectives to protect, enhance, and restore the Rouge Park’s natural features. The ecological criteria provided greater certainty to the process and predictability, and a manual was produced to identify the step-by-step process.
- **PERSEVERE!** The success of the *Rouge North Management Plan* process was due to patience, commitment and integrity, and required a substantial investment in time. Mr. Baird described the process as long and, at times, frustrating. “But we didn’t give up. We stuck to it and the public benefits are huge.”

RELATED AND FUTURE INITIATIVES

The town received final approval of the *Rouge North Management Plan* Official Plan amendment by the Region of York, but this approval is subject to appeal by landowners. “We are in the process of talking to other public agencies and consultants and will meet with appellants to see if there are any revisions we can make to the document that we can both live with,” Mr. Baird said.

Markham is also working on developing the monitoring program that will ensure that the town is able to gauge and quantify the success of these policies over time. It has also requested that the Rouge Park Alliance seek funding from the provincial government to develop a strategic plan to assist with the acquisition of significant Rouge Park lands.

On other sustainable development fronts, the town is developing a smart growth community called Markham Centre. With a planning area of almost 405 hectares (1,000 acres), Markham Centre will be North America’s largest greenfield project and feature a distinctly urban character with high-density development. With assistance from FCM’s Green Municipal Funds, the town and Markham Hydro created Markham District Energy

Inc. (MDEI), an arms-length organization that will produce heat and power for the new Centre. MDEI already provides power to two of the town’s major employers: IBM and Motorola.

PARTNERS AND COLLABORATION

Internal

Development Services
Environmental Planning

External

Rouge Park Alliance
Toronto Region Conservation Authority
Urban Development Institute
Ontario Ministry of Natural Resources
Ontario Realty Corporation
Town of Whitchurch-Stouffville
Region of York
Town of Richmond Hill
Several community stakeholders groups and individual landowners

PROMOTIONAL ACTIVITIES

Since 1996, over 160 public consultations were held in the development of the management plan. Stakeholders included landowners, public and environmental interest groups, and the development community. The Official Plan amendment process also engaged the public and several agencies in over 15 stakeholder, technical, Rouge Park Alliance, and Development Services meetings.

Where site-specific or highly technical issues were identified, meetings were held with the concerned parties. Larger meetings and workshops resulted in significant progress to resolve matters by ensuring that all parties had an opportunity to provide input. Formal and informal meetings with town council were also held throughout the process.

Individual stakeholders also informed the public about the amendment through their own Web sites.

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Additional Web sites:

Rouge Park Alliance:

www.rougepark.com/about/alliance/rp_alliance.php



WATER



Niagara Water Quality Protection Strategy (NWQPS)

Population: 410,000

SUMMARY

The Niagara Region developed the NWQPS in partnership with the Niagara Peninsula Conservation

Authority and the Ontario Ministry of Environment to protect water quality in a 2,500-km² area. The region first examined water-related activities and characteristics in more than 145 separate watersheds and incorporated all of the data into one comprehensive database. The strategy was then developed with roles and responsibilities of various government departments and public agencies clearly laid out, and a long list of prioritized actions was identified. The NWQPS has proven most effective in co-ordinating water management efforts among the Region's water agencies and stakeholder groups and has resulted in several best management practices being applied to sensitive environmental areas. The strategy also included a public education program designed to increase water efficiency.

BACKGROUND

The Niagara Region is, quite literally, surrounded by water—Lake Ontario, Lake Erie, the Niagara River, and of course, Niagara Falls, one of the natural wonders of the world. Comprising 15 urban and rural municipalities (12 local area municipalities, Regional Niagara and parts of the neighbouring City of Hamilton and Haldimand County), the Niagara Region has many agricultural, tourist and other businesses that put pressure on local water resources.

Several different organizations influence water management, including the Ontario Ministries of Environment, Natural Resources, Fisheries & Oceans, various non-government organizations, and the municipal governments themselves.

The region's water strategy began as an idea in early 2001. "The region and its partners discussed the need for a watershed-based plan to address issues of water quality," recalled Ian Neville, the region's commissioner of public works. "What happened in Walkerton did have an influence. But initially we started the water strategy because so many agencies were working on various components and creating overlap that it became obvious that we needed to co-ordinate our efforts."

The strategy complements the region's *Water and Wastewater Master Servicing Plan* as well as *Smarter Niagara*, and the region's sustainable business plan, which identifies water as a high priority.

PROJECT DEVELOPMENT

The Niagara Region took the lead in managing the partnerships needed to develop the strategy. This was challenging at times, but the region recognized that the strategy would be stronger by having a wide range of expertise and experience to draw on.

In the fall of 2001, regional staff met with the Niagara Peninsula Conservation Authority (NPCA) and the Ontario Ministry of Environment (MOE) to discuss water management issues. This was the beginning of a multi-stakeholder partnership that would result in the *Niagara Water Quality Protection Strategy (NWQPS)*. The following summer, staff from the region and the NPCA made presentations to municipal councils to solicit their participation as well.

In developing the strategy, the region organized the process into four stages:

1. Collecting and assessing background data.
2. Characterizing the study area.
3. Developing the management strategy.
4. Creating an implementation framework.

PROJECT DETAILS

The region created a steering committee, which reflected the broad variety of participating stakeholders, to co-ordinate the process. The committee, comprised of senior staff, political representatives, the NPCA general manager, the MOE district manager and agency representatives, provided guidance for the consultant teams and a technical review committee.

From October 2002 to January 2003, the technical review committee collected information on the entire Niagara watershed into one database. "Data collection was a large part of the development process," said Mr. Neville. "We brought in experts from nine different technical areas and that helped us to identify gaps and then how to fill those gaps." Well over 1,000 documents, including maps and reports, were input into the database.

Staff then characterized the study area (2,424 square kilometres in size) to understand the influence of human activities, past and present, on the area's water resources. The information collected in this phase, from January to March 2003, resulted in a summary of issues and preliminary opportunities.

Having accomplished these two phases, the NWQPS team developed an integrated management strategy and implementation framework.

First, the team established six strategy areas, each with its own economic, environmental and social objectives:

1. Human health
2. Natural environment



3. Property risk and liability
4. Recreation
5. Commerce
6. Agriculture

All the strategy areas had numerous issues and opportunities associated with them, so the team made a long list of actions, alternatives and priorities for each. The team also identified 24 core issues to be addressed, including beach closures, lack of public awareness, low surface water levels, shoreline and stream erosion, and the impact of emissions from transportation.

Next, the NWQPS team developed a plan to implement 11 “Action Programs.” These programs ranged from education and awareness building, to a groundwater study, agricultural best practices, and land-use planning. Each program is composed of a mandate, what is currently being done, a list of potential initiatives, and short-term priorities (0 to 5 years). In total, over 300 new actions have been proposed.

For example, under the Land Use Planning action program, the region is undertaking a wetlands classification program that will expand its parks and open spaces systems. Within five years, the program aims to create new policies to protect water sources, such as locating large livestock operations and landfills in areas that will lower the risk of water contamination. Other proposed actions include creating a regional wetlands policy and standardizing land use regulations affecting water resources across the watershed.

It is a rare accomplishment to develop such a comprehensive strategy in such a short period of time. Typically, watershed plans focus on a few key issues and do not take the multi-faceted approach adopted by the region. The region’s process took 15 months and identified public health, natural environment, property risk and water-use issues.

“We purposefully developed the strategy on a tight schedule so that we could quickly identify and characterize key issues and implement responses,” Mr. Neville explained. “But this is a ‘living’ document that provides a long list of actions that will be developed over the next 30 years.”

To ensure that the strategy is implemented, regional council appointed a Water Strategy Implementation Committee to direct the collective efforts of departments, agencies and community groups in achieving water management goals.

Regional staff encountered surprisingly few problems in developing the strategy. Although the data collection phase took longer than expected, developing the actual strategy and implementation plans so quickly reflects the level of commitment by the partners. “We negotiated a reasonable agenda with the stakeholders because we knew it was going to be an involved and complicated process,” said Mr. Neville.

The public consultation process was also a critical success factor and the region formed seven advisory committees. Over 60 community groups actively participated, expressed their concerns and provided input into the strategy. “Their involvement was key and we were concerned that there wasn’t enough time built into the process for their input,” said Mr. Neville. “But the public recognized the need for stewardship because our future depends on water.”

RESULTS

- Established a watershed co-ordinating body, the Water Strategy Implementation Committee, to oversee all water management issues. Prior to adopting the strategy, many stakeholders had an influence over the Niagara Region’s water resources. By co-ordinating efforts and applying best practices, the strategy identified sensitive environmental areas and the committee works to ensure that the most appropriate methods are used to protect and restore them.
- Created the NWQPS database, which handles all watershed data, from a catalogue of existing information. Updated and consistent data will be added as it becomes available and will be used to pinpoint problem areas and to prepare annual progress reports.
- The strategy addresses the needs of over 145 individual watersheds in the Niagara Region to improve water quality and address human health issues and environmental quality.
- The community is much better informed about the need for water protection and how to use water more efficiently.
- The strategy includes 11 key action programs with over 300 separate actions in the form of projects, studies and policies that will be implemented over the next 30 years.
- The strategy summarized all the municipal, provincial and federal regulations and policies and recommended how those policies can be refined to address future issues.

LESSONS LEARNED

- **DEVELOP A CO-OPERATIVE APPROACH.** The region’s multi-disciplinary approach involved all watershed agencies, each bringing different knowledge and expertise to the table.
- **LINE UP RESOURCES EARLY.** The region obtained the resources it needed from all its stakeholders early in the process and will rely on the partners’ long-term commitments.
- **CHAMPIONS.** Early in the process, Mr. Neville discussed the need for a water protection strategy with the region’s Medical Officer of Health and the General Manager of the NPCA. “They planted the seed and said that we needed an overriding strategy as opposed to dealing with issues on a one-on-one



NIAGARA REGION, ONTARIO

basis.” Representatives from the NPCA and the Public Health department sat on the steering committee.

- **GET COMMUNITY “BUY IN.”** Mr. Neville stressed the need to fully embrace the community to maintain their interest and dedication. “It’s important that all the stakeholders see the ‘light at the end of the tunnel,’” said Mr. Neville. “You can’t expect them to participate in something that goes on and on.”
- **CONCENTRATE ON ACTION.** Developing a long-term strategy is important, but having some short-term actions that produce results also helps maintain community interest.
- **FOCUS ON THE END GOAL.** Mr. Neville recommended that municipalities “start with the end in mind.” With the goal of protecting Niagara’s water resources at the forefront—and using a structured framework that all partners approved of—the region maintained stakeholder interest and commitment that will ensure the strategy’s long-term success.

RELATED AND FUTURE INITIATIVES

The 11 Action Programs are laid out in detail in the region’s publication, *Water for Life in Niagara*. It will cost roughly \$250 million over the next 30 years to implement all the initiatives and different programs will be implemented and funded through different governments or agencies. For example, the NPCA began a monitoring program to study the area’s groundwater resources, while the region has plans to upgrade its water and sewage treatment systems.

The Niagara Children’s Water Festival was a direct result of the NWQPS and has now become a popular annual event. The festival is designed to educate children about water conservation, protection and related environmental issues. “It’s important to involve youth in water protection and conservation because they take those messages home to their parents,” said Mr. Neville.

The Niagara Region also partnered with the City of St. Catharines, Ontario to study new wastewater treatment technologies, funded in part by FCM’s Green Municipal Funds. Currently, all of the municipalities in the Niagara Region use combined sewer overflows to handle sanitary and storm overflow during rainstorms. Overflow water is discharged directly into streams or other bodies of water, often releasing harmful pollutants. If suitable, the new treatment technology could avoid the need to pump the overflow water to the wastewater plant for treatment, and would separate many organic pollutants from the wastewater before it is discharged. The project would reduce the discharge of pollutants and cut the city’s energy consumption and greenhouse gas emissions, because it eliminates the need for increased pumping by the existing wastewater treatment plant and by pumping stations.

PARTNERS AND COLLABORATION

Internal

Regional Niagara Public Works Department
Regional Niagara Planning and Development Department
Regional Niagara Public Health Department

External

Niagara Peninsula Conservation Authority (NPCA)
Ontario Ministry of Environment
Ontario Ministry of Agriculture and Food
Niagara Escarpment Commission
Environment Canada
Brock University
Niagara College
Niagara District Public and Catholic School Boards
Ontario Power Generation
Niagara Chamber of Commerce
City of Hamilton
Haldimand County
All local area municipalities comprising the Niagara Region

PROMOTIONAL ACTIVITIES

Regional staff developed an NWQPS area on the region’s Web site, a quarterly newsletter, and distributed key documents related to the strategy to the general public, including *Water for Life in Niagara*, the document which sets forth the details of the 11 action programs.

The NWQPS was first launched at a meeting held in October 2002 at which Paul Muldoon, executive director of the Canadian Environmental Law Association, was the keynote speaker. Over 60 community organizations attended. In July 2003 an open house and public forum was held, with Gord Miller, the environmental commissioner of Ontario, providing the keynote address. That summer, the region also held its first Niagara Children’s Water Festival.

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2004 Honourable Mention

SUSTAINABLE TRANSPORTATION

You Can Clear the Air: Grade 3 Curriculum Supplement

Population: 480,000

SUMMARY

You Can Clear the Air, a supplement to the Grade 3 curriculum, is part of the implementation plan of the Region of Waterloo's *Transportation Master Plan*. With the intent of raising a new generation of travel-wise citizens, the program educates children about issues related to the use of motor vehicles and air pollution. The teachers' guide includes games, activities, facts and exercises and, to date, 690 students have been part of the program. If only five per cent of these students make a change in their travel habits—by encouraging their parents not to drive them to school—about half a tonne of greenhouse gas (GHG) emissions will be diverted every year. The region expects the most significant impacts to come in the future when this generation of students is in a position to make their own travel choices.

BACKGROUND

The Region of Waterloo is made up of three urban municipalities—Cambridge, Kitchener, and Waterloo—and four rural townships—North Dumfries, Wellesley, Wilmot and Woolwich.

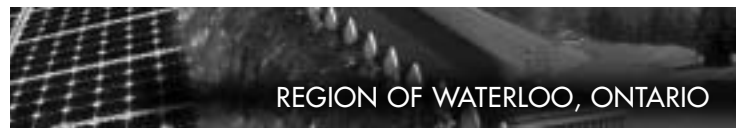
Waterloo Region has a history of environmental leadership. In 2002, for example, the region won the FCM-CH2M HILL Sustainable Community Award for its *Protecting Water Supplies at the Source* program, and in 2001 for its *Transforming Greenhouse Gas into Renewable Energy* program.

Like other fast growing urban communities, the region has struggled with issues of poor air quality, increased traffic congestion, and worsening incidences of obesity and asthma. To address these issues, the community asked the regional government to place more emphasis on reducing automobile use.

PROJECT DEVELOPMENT

You Can Clear the Air began with a direction by regional council as part of the *Region's Transportation Master Plan* (RTMP), adopted in 1999. The RTMP identified 13 action steps, one of which was to educate the public about transportation demand management (TDM) initiatives. *You Can Clear the Air* was seen as one way to educate a new generation of residents about the effects of their travel choices.

The short-term goal of the project was to introduce a TDM educational tool for local teachers. "For a community our size, regional council was very forward-thinking when they said that they wanted to look to a future of reduced automobile use," said JoAnn Woodhall, TDM planner.



REGION OF WATERLOO, ONTARIO

The region had developed a similar curriculum package for water conservation, so the project team began by studying the water department's experiences and the resources that they developed.

In January 2002, regional council allocated approximately \$25,000 (over two years) to the project, most of which was used to hire an independent consultant—who had experience in the design and delivery of public, adult training, and youth education programs—to research, prepare and help test the materials.

The region's transit authority, Grand River Transit (GRT), came onboard as a project stakeholder early on because the region wanted the program to include an opportunity for students to learn more about public transit; Grade 3 was seen as the ideal time. GRT staff provided valuable in-kind services that are not accounted for in the program budget.

Community-based social marketing (CBSM) principles were used when creating the materials. CBSM emphasizes direct contact among community members in order to change behaviour by first identifying barriers to change, and then developing initiatives to overcome them. "To get a message across, you need the voice of people who are already in contact with the group you want to change," explained Ms. Woodhall. "This really hit home to me when developing this program because teachers can help establish the 'norm' among students."

PROJECT DETAILS

Over a six-month period in 2002, the curriculum materials were developed, with feedback from GRT, and were then presented to co-ordinators at the two Waterloo school boards and to regional council.

In the fall of 2002, the region held a workshop for teachers who had volunteered to participate in a pilot to test the materials. Based on their feedback, the final product was fine-tuned throughout the spring of 2003 and the program was launched that fall. "It was about an 18-month timeline," said Ms. Woodhall. "It was important to take the time necessary to provide a high quality product. It's something we really believe in here at the region."

You Can Clear the Air has three components:

1. A 100-page Teachers' Guide
2. A GRT bus tour
3. "Our Kids Say...Travel Wisely" promotional campaign





REGION OF WATERLOO, ONTARIO

The Teachers' Guide is filled with facts, activities, exercises and games that show children how their, and their parents', travel choices affect the air they breathe. The Guide meets Province of Ontario curriculum guidelines, and teachers can use the materials to address strands in social studies, health and physical education, English, arts, and science and technology study areas.

One of the most popular exercises is called "Put a sock on it!" where the students cover up a car's tailpipe with a sock to see how much pollution a car emits. "One of the classes used their principal's sport utility vehicle as the test vehicle and both he and the students were shocked by how dirty the sock was!" recalled Ms. Woodhall. "One teacher even kept the sock and used it to get the message across to other teachers months later."

Other activities encourage students to learn outside of the classroom, such as keeping a log of their family's weekly travel behaviour. Many of these exercises help to prepare students for their trip on a GRT bus.

Teachers schedule the bus tour directly with GRT. A GRT tour facilitator and the teacher plan a route and a map is sent to the teacher ahead of time so that the children can follow along once they are on board. A driver and a GRT facilitator accompany the children on the tour, and GRT sends a bus that is fully accessible so that all students can take part.

Before boarding, GRT staff members explain to the students the important things about riding public transit, such as boarding safely, how a driver can help in case of an emergency, and that roads could take up less space in the community if more people took public transit.

Then it's off on the tour! Children pay the "fare" with poems, pictures, or songs and are given a checklist of things to watch for, for example, how many cars are on the road and how many people are in each car, the different traffic and crosswalk signals, and neighbourhood features like churches, hospitals, and schools.

All of this is designed to give children a better sense of their local geography and make them more comfortable using public transit. "The project is rooted in the real world," said Ms. Woodhall. "It pertains to the immediate environment and lets students see their neighbourhood in a new way—both literally with the bus trip, and figuratively." At the end of the tour day, each student receives a small gift pack that includes an activity booklet, a fridge magnet, a bus schedule for the area, and a reflector light.

In "Our Kids Say...Travel Wisely" campaign, students' artwork is used to create advertising boards on GRT buses, and has also been used to complement news articles and other regional publications, such as an upcoming cycling brochure.

It can be difficult to measure the success of programs that are aimed at changing long-term behaviour, but there are indications that *You Can Clear the Air* has changed students' perceptions.

Teacher Peggy Dieterle, who was involved in the pilot phase, reported that even months after the unit had been introduced, her students were still noticing examples of poor behaviour and offering solutions. In a letter to the region, Ms. Dieterle said: "In conversations with parents, they mentioned that their children were eager to share information and some students have been asking their parents to turn off their cars instead of letting them idle."

Going beyond its municipal boundaries, the region has made the program materials available on CD-ROM and distributes it to transit services companies, public health officials, and other TDM professionals. "We'd love it if people across Canada incorporated the program into their schools...with some background work, they too can experience the results!"

RESULTS

- Over 690 Grade 3 students have heard the messages of the program, and all requests for GRT tours have been filled. If only five per cent of these students can encourage their parents to let them walk or bike to school, about half a tonne of GHG emissions would be eliminated every year.
- The Teachers' Guide gives teachers the facts and tools to help students learn more about air pollution, its effects, and their role in making transportation choices. It is available in CD-ROM format to any organization, upon request.
- An excellent relationship was developed between the region's transportation planning department and GRT to help deliver the bus tour segment of the program, which will help in future collaborations between departments.
- "Our Kids Say...Travel Wisely" informs the wider community of the importance of sustainable transportation.

LESSONS LEARNED

- **COMMUNITY-BASED SOCIAL MARKETING.** CBSM was a key part of this program, ensuring that students heard the messages from trusted sources.
- **CHAMPIONS.** Senior management "buy in" and strong partnerships helped to remove any potential concerns. Graham Vincent, director of transportation planning, was particularly effective in providing feedback and encouragement to the project leader.
- **ALLOW FOR FEEDBACK TIME.** Before launching the program, the materials were piloted with 13 teachers to gain their insights, ideas, and suggestions. Project staff realized that, because teachers' workloads are often quite heavy, they needed to build in additional time for feedback.



- **MAKE COPIES AVAILABLE.** The project team provided at least one copy of the materials to every school in both school boards. In addition, they prepared a CD-ROM for any other organization that requests the information.
- **ENSURE A LONG SHELF-LIFE.** The project team will periodically update the Teachers' Guide as new information becomes available, and circulate the updates to schools.
- **BE AWARE OF WHAT OTHERS ARE DOING.** Ms. Woodhall advised finding out what local transit providers and citizen groups are already doing since they may already have an educational component to their services.
- **BE SENSITIVE TO CURRENT EVENTS.** "EcoTracks," a program that encourages children to walk to school together, is a feature of the program. However, it was not widely implemented during the pilot due to an incident involving the assault of a student that occurred around the same time. The region believes strongly that this is a vital part of the program as it addresses the safety concerns held by parents, which contributes to their decision to drive their children to and from school.

RELATED AND FUTURE INITIATIVES

The region is now developing further curriculum materials for a Grade 5 supplement that address the transportation issue from an energy perspective, and in the future are looking to a Grade 8 supplement on land use issues.

The region is also developing a feedback mechanism where teachers, parents, and students can offer suggestions on improving the program. The tool will allow the region to notify teachers of program updates.

The region's Official Plan will soon be amended and will include a review of policies to improve walking, cycling and transit components, with the goal to increase the use of sustainable transportation. Other initiatives underway, meant to support this goal, include:

- conducting a sidewalk inventory to identify infill priorities;
- approving an updated cycling master plan;
- launching an employee travel options program; and
- reviewing land use and transportation policies in conjunction with development applications.

Waterloo Region was selected as one of eight Canadian municipalities to receive funds from Transport Canada's Urban Transportation Showcase Program. The region plans to create the "Central Transit Corridor Express," a 33-kilometre long corridor that will connect downtown areas, two universities, office complexes, major hospitals and regional shopping centres. The CTC Express will be integrated with other transit services and linked to sustainable modes of travel, including improved pedestrian amenities and bicycle access on transit.

PARTNERS AND COLLABORATION

Internal

Planning, Housing and Community Services—Transportation Planning
 Transportation and Environmental Services —Transit Services (GRT)
 Corporate Resources

External

Waterloo Region District School Board (public)
 Waterloo Catholic District School Board
 Greenest City
 Active & Safe Routes to School (a program of Go for Green)

PROMOTIONAL ACTIVITIES

Articles about the program appeared in the daily newspaper, *The Record*, in *Newsline*, a GRT publication and in the region's *Environews*, a newsletter delivered to every household in the region. The local Active & Safe Routes to School co-ordinator gave permission to have their program referred to in the Teachers' Guide as a complementary initiative and have reciprocated by agreeing to mention the *You Can Clear the Air* unit in their meetings with teachers.

The "Our Kids Say... Travel Wisely" artwork reflects the messages of clean air and sustainable transportation and are used as GRT bus advertisements. The region plans to make this an annual part of the program and prepare a media announcement in June of each year. The region is also developing a strategy to promote the program at community and teacher events and to continue offering teacher workshops each year.

CONTACT INFORMATION

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Region of Waterloo

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Additional Web sites:

Greenest City: www.greenestcity.org

Go for Green: www.goforgreen.ca

Active & Safe Routes to School:

www.goforgreen.ca/asrts/home_e.html

Grand River Transit: www.grt.ca

Transport Canada, Urban Transportation Showcase Program:
www.tc.gc.ca/programs/environment/utsp/menu.htm



WASTEWATER



Wastewater Treatment Plant

Population: 2,600

SUMMARY

For years, raw sewage had been dumped into the harbour of the Town of Lunenburg. The town's new

treatment plant uses a combination of grit separation, biofilter reactor, digester, dissolved air floatation tanks, and ultraviolet light to treat sewage before discharging the cleaned, disinfected water back into the harbour. The sludge produced by the treatment plant is turned into compost at a regional composting facility. With sewage now being diverted and clean, treated effluent flowing back into the harbour, the harbour will naturally clean itself within three to five years. Municipal officials believe that the clean up will play a major role in the future redevelopment of the town's historic waterfront.

BACKGROUND

The Town of Lunenburg is best known for being the home of the Bluenose, the fastest sailing ship in Canadian history. This historic town—formally established in 1753 as the first British Colonial settlement in Nova Scotia outside of Halifax—places a high priority on water and water quality, as demonstrated by its motto, “Healthy Harbour, Healthy Community.”

Over the last decade, the town had initiated several waste management and beautification projects, such as composting, recycling and park rehabilitation. In 1995, after being designated a World Heritage site, the town commissioned a team of international professionals to develop a *Community Cultural Plan*.

The plan identified a major problem: sewage was still pumped directly into the harbour. Much of the town's economy is based on fisheries and on tourism, and the plan showed how Lunenburg's polluted harbour had become a disincentive to new development, which would undoubtedly affect the future growth and prosperity of the town.

PROJECT DEVELOPMENT

The town began to address the problem as far back as 1990. First, a lift station was built to prevent sewage from entering the Back Harbour. Between 1998 and 2000, several new sewer pipelines were installed in various locations to carry effluent to new pumping stations. But to make all of these initiatives work effectively, the town needed a full-scale sewage treatment plant.

Funding for environmental protection projects can often be difficult for small communities. However, as one town official put it: “Having the town as a World Heritage site—one of only 13 in Canada and one of only two in urban areas—attracted awareness of the problem and funding as a special case since the community's population is very small.”

With the strong leadership of Mayor Laurence Mawhinney, who pushed the project forward as a community team effort, the project proceeded with the following goals:

- Short-term: Divert all outfalls (holding areas into which sewage flows) to a new treatment plant by the end of 2003 so that raw sewage no longer empties into the Front Harbour. Connect all residences and commercial areas to the system by the end of 2004.
- Long-term: Have a naturally-cleaned harbour as a result of the project within three to five years in order to open up new economic development opportunities, particularly along the waterfront area.

PROJECT DETAILS

Building on the pollution prevention initiatives already underway, the project began in the fall of 2001 with the design and tendering of the town's first sewage treatment plant. Representatives from the Nova Scotia Department of Environment and Labour sat on the town's technical steering committee during the development stages. Construction began in 2002.

The plant is one of the first facilities of its kind in Canada to combine two technologies specifically to treat sewage: a biofilm reactor and a dissolved air flotation (DAF) system. Project staff and the town's engineering consultants searched for similar projects in Canada—which would have made troubleshooting problems easier—but could find no other municipality that used this specific combination of sewage treatment technologies.

First, tiny bubbles separate solids from wastewater, bringing them to the surface to be skimmed off. The clarified wastewater is then treated using ultraviolet disinfection to minimize the amount of chlorine required. Finally, the cleaned water flows back into the harbour.

Treated effluent is tested daily to meet provincial guidelines and effluent standards have been met during all dry weather days; some additional work is now underway to meet the standards during heavy water flow days.



After the solids are skimmed off, they are trucked to a composting facility and held in a lagoon until the fluid evaporates. They are then put through a composting facility and the final compost produced is sold to the public and used in municipal landscaping.

The town also incorporated green building practices into the plant, such as maximizing natural light and using energy-efficient lighting fixtures. The plant was also designed so there is no actual pumping of effluent in the plant itself. Instead, effluent flows by gravity, which will help reduce electrical costs. The facility opened in September 2003 and some additional work was completed in the summer of 2004.

Getting to this final phase, however, took a concerted effort to find the necessary funding and to educate residents and the business community about the importance of the project.

Building a sewage treatment plant is expensive, particularly for small municipalities that have limited access to funding. The town received almost \$3.5 million from the Canada-Nova Scotia Infrastructure Program and close to a \$1.2 million loan from FCM's Green Municipal Funds to cover construction costs. "This is a remarkable achievement for the town," said Mayor Mawhinney. "We are grateful for all the support offered by the community and the other orders of government that has made this facility possible."

Obtaining funding was a lengthy process, so the project had to be phased in as funding was identified. In addition, the town introduced quarterly sewer billing for all residential and commercial properties to create a sustainable revenue stream to offset the facility's future operating costs.

The town held several public information sessions for residents and included updates in its newsletter *Water Watch*. Local newspapers also followed the project's progress. Community support is very high and the town has received no negative comments from the public.

The town also worked with the business community to educate them about the sewer system and to ensure that they put only approved products into it. The town enacted a new sewer use bylaw—developed using a model bylaw provided by the Province of Nova Scotia—which requires sewage pretreatment if commercial users do not comply, and a compliance program that gives users a reasonable amount of time to comply.

The true measure of success is, of course, that raw sewage is no longer dumped into Lunenburg's harbour and the effects are already noticeable. For example, during the first phase of the

project, the town began diverting sewage from the Back Harbour to the Front Harbour, with the results immediately apparent to the public.

"This new facility will enable Lunenburg to move forward in the development of new economic diversification," said Mayor Mawhinney. "It will provide an environmentally friendly harbour, which is both a boon to the traditional industries as well as to the growing market for ecotourism and cultural reflection."

RESULTS

- Sewage is no longer dumped into harbour and, within three to five years, the harbour will naturally clean itself as a result of this project. Visibility through clouded water has already improved from about one metre (four to five feet) in 2003 to over three metres (10 to twelve feet) in 2004.
- The town had no sewage treatment in place prior to this project. Although there are no direct financial benefits, the operating costs of the plant will be reduced due to the use of ultraviolet irradiation of effluent, rather than chemical treatment, and the composting of sludge.
- Quarterly sewer billing will pay for all of the facility's operating costs. Currently, the billing does not fund 100 per cent of the project. The town has built up a small reserve to ensure that the sewage rates do not increase; however, there was a \$78,000 shortfall during the 2003–2004 fiscal year.
- Most of the town's houses and businesses, which had been pouring untreated waste directly into the harbour, are now connected to the sewage treatment system. For example, High Liner Foods Inc., located outside the town in Lunenburg County, entered into an agreement with the town to have its sewage treated, giving an additional benefit to the adjacent municipality.
- A clean harbour will play a major role in the future development of the town's historic waterfront.

LESSONS LEARNED

- **SET REALISTIC GOALS.** The town's long-term goal to construct a sewage treatment facility was met by carefully considering operational, financial and eventual outcomes. Town officials stressed that it was important to be persistent and to use all angles necessary to heighten the importance of the project.



TOWN OF LUNENBURG, NOVA SCOTIA

- **COMMUNITY SUPPORT IS KEY.** The town kept the entire community informed through meetings and information materials, and worked closely with the business community to ensure compliance with the new use sewer bylaw.
- **NEW TECHNOLOGY: PRO & CON.** The two technologies employed had never before been used in combination to treat wastewater. Although the process needs some fine-tuning, it has produced noticeable results much sooner than expected because the town was able to remove sewage and return cleaned water to the same area in the harbour. However, there was little information from other municipalities that the town could rely on to troubleshoot problems and, as a result, the time to commission the plant took longer than expected. The next time this combination of technologies is used in another community, therefore, the work done in Lunenburg will be invaluable.

RELATED AND FUTURE INITIATIVES

The Province of Nova Scotia designated the town a model pollution prevention (P2) community—for its high rate of waste diversion and composting—and the town’s best practices are shared with other municipalities. The three-year P2 project involves developing actions that residents and businesses can take to reduce water consumption and at-source waste reduction to reduce overall sewage volumes for treatment. The project includes educational materials, home environmental audits, public displays, and school programs.

The P2 project also includes a Green Business Network (GBN). The Network includes representatives from the Town of Lunenburg, the Department of Environment and Labour, Lunenburg Board of Trade, local businesses and Environment Canada. It promotes the environmental and economic benefits of adopting pollution prevention efforts in small- to medium-sized businesses in Lunenburg.

In one GBN initiative, world-renowned environmental expert Robert Pojasek, an adjunct professor at Harvard University’s School of Public Health, was asked to make a presentation to the Lunenburg Board of Trade on how pollution prevention can benefit the business community. “Lunenburg is a working town that enjoys many tourists,” said Tony Cox, former co-chair of the Board. “Having businesses on board to prevent pollution is very important to our town. Many of our businesses are situated within close proximity to the harbour and are already very conscious of waste, but there’s always more that we can do.”

PARTNERS AND COLLABORATION

Internal

Town Council
Town Manager/Clerk and Finance Department
Public Works Department

External

Canada–Nova Scotia Infrastructure Program
Nova Scotia Department of Environment and Labour
Federation of Canadian Municipalities
Parks Canada
Bluenose Atlantic Coastal Action Plan
Lunenburg Board of Trade

PROMOTIONAL ACTIVITIES

The town held numerous meetings to inform the public about the types of technology to be used, the cost to taxpayers, and the location of sewage treatment plant. Public input was also sought at each stage of construction and, as a result, the plant’s location was moved to address public concerns that it was too close to residential areas.

The project was a regular part of the town council agenda every month during all phases of development, design, and construction. Monthly meetings were held with the town’s partners, sometimes as often as weekly, for several years to keep all government levels updated.

The plant includes an interpretive area that explains the sewage treatment process, allowing the public, especially school-aged children, to learn more about the plant and the value of a clean community. Public tours have also been given and will continue in future. For the last four years, the town has kept a table of display units at its Town Hall where the public can track the progress of this, and other, municipal projects.

CONTACT INFORMATION

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Web site: www.explorelunenburg.ca

Additional Web sites:

Green Business Network:

www.gov.ns.ca/enla/envin/p2/lunwaterp2.asp

2004 Award Submissions

BUILDINGS

CITY OF BARRIE, ONTARIO

Population: 115,000

East Bayfield Community Centre Energy Efficient Design

The City of Barrie's used the federal Office of Energy Efficiency's Commercial Building Incentive Program (CBIP) standards to build a state-of-the-art recreational facility. The HVAC (heating, ventilation and cooling) system uses ground source heat pumps, boilers and a cooling tower, and in-floor radiant heating. All the waste heat generated is recirculated to heat other parts of the building. Skylights and translucent panels take advantage of day lighting as much as possible, and change rooms and storage areas were equipped with occupancy sensors. As much as 260 tonnes of equivalent CO₂ and operational costs of between \$115,000 and \$135,000 will be saved each year. The project also spurred the city to form a permanent building committee that will oversee all aspects of energy efficiency in new buildings as well as in retrofits of existing buildings.

**Contact: Barry Thompson,
Energy and Environment Officer,
(705) 739-4220**

CITY OF RICHMOND, BRITISH COLUMBIA

Population: 168,000

Power Smart Initiatives

The City of Richmond undertook a series of energy-efficiency initiatives in several municipal facilities to reduce energy, operating and maintenance costs and to improve user comfort. Projects included lighting retrofits and control upgrades in community, cultural and seniors' centres, converting traffic lights to a light emitting diode (LED) system, and setback controls on heating, ventilation and cooling systems. Setback controls alone saved an estimated \$34,000 in electricity costs, while the switch to LEDs saved \$85,000 in energy and maintenance costs. Adjustments to program controls in seven facilities saved an additional \$40,000 in electricity costs. Annual reductions in greenhouse gas emissions have been estimated, conservatively, at approximately 500 tonnes.

**Contact: Phil Hogg,
Manager, Facilities Operation and Maintenance,
(604) 244-1243**



CATEGORY SUMMARIES

CITY OF VANCOUVER, BRITISH COLUMBIA

Population: 550,000

Building the Future:

A Sustainable Works Yard

The City of Vancouver's works yard has been redeveloped as part of a sustainable residential community that combines housing, jobs, integrated transportation and proximity to the downtown core. The area will also include the future home of the 2010 Olympic athletes' village, which will ultimately become part of the housing stock. The city used LEED (Leadership in Energy & Environmental Design) Green Building Rating System as the framework and as an evaluation tool to retrofit several of the buildings on the site. The buildings feature ground source heat pumps, water conservation measures, recycled building content and energy-efficient lighting. Combined, the buildings use 40 per cent less energy, 60 per cent less potable water, and 95 per cent of construction waste was recycled. The new building practices have also been incorporated as regulatory pilots for the city's building officials.



**Contact: Peter Bremner,
Facilities Development Engineer,
(604) 871-6720**

RED DEER COUNTY, ALBERTA

Population: 19,000

Red Deer County Administration Building

In the design of its expanded administration building, Red Deer County used locally available materials and technology. The building was oriented to take advantage of passive solar gains and a dark-coloured roof absorbs additional heat. Using no fossil fuels and little electricity to operate, geothermal pumps heat and cool the building and heat all the water required. A well was installed to use untreated water in both the atrium and the water wall, which humidifies the building. Waterless urinals save up to 40,000 litres of water per urinal per year. The new facility is so efficient it no longer requires a property management firm to deal with the mechanical and structural systems, saving the county \$50,000 annually.

**Contact: Frank Peck,
Director of Operations,
(403) 350-2163**



**TOWN OF STONY PLAIN,
ALBERTA**

Population: 10,500

Town Administration Building

The Town of Stony Plain explored every cost-effective and environment-friendly avenue when it initiated its Town Administration Building

project. The old building lacked the space required for 19 full-time staff and council members, and required major upgrades to its mechanical system and roof. The new building features improved envelope insulation, high performance windows and doors, natural ventilation, a heat recovery wheel, groundwater cooling, water conservation methods, and occupancy sensors on lighting controls. Preliminary estimates show that the building will use 50 per cent less energy than a similar reference building, which exceeds the guidelines of the Model National Energy Code for Buildings, and will reduce annual energy costs by almost \$10,000.

**Contact: Phil Hamel,
Town Manager,
(780) 963-2151**

ENERGY

**DISTRICT OF WEST VANCOUVER,
BRITISH COLUMBIA**

Population: 42,000

Micro Hydro Generation

Two individuals initiated this project by asking the District of West Vancouver to support an alternative energy project at the Eagle Lake and C2 Reservoir. A Pelton Wheel turbine uses the water's embedded energy, which is often dissipated within the distribution system, to generate 1.2 million kWh per year (20 per cent of the district's corporate consumption) with no environmental impact. The district partnered with Pacific Cascade Hydro to design and construct the facility, and, in the first 10 years of operation, the district will retain 75 per cent of the net operating income. That will increase to 100 per cent after 20 years. West Vancouver expects to recover its investment in less than six years, and, over the 20-year life of the agreement, net revenues are expected to be \$700,000.

**Contact: Raymond Fung,
Manager, Utilities,
(604) 925-7159**

**SUSTAINABLE COMMUNITY PLANNING
CITY OF CALGARY, ALBERTA**

Population: 925,000

Corporate ISO 14001 EnviroSystem

The City of Calgary is one of the first Canadian municipalities to achieve corporate-wide ISO 14001 registration, the highest standard for environmental management systems. The city had a history of inconsistent environmental management and fines for environmental infractions. By using a triple bottom line decision-making approach, which involved all of the city's business units, the city increased its operational efficiency, reduced its environmental impact, and saved millions of dollars. Over 80 per cent of the city's environmental performance targets were achieved including a 2.2 million litre reduction in water use, and a street lighting retrofit initiative that reduced annual costs by \$2 million and CO₂ emissions by 16,000 tonnes. A cross-departmental team of staff representatives also meets regularly to address and resolve specific corporate-wide environmental issues.

**Contact: Zennon Zalusky,
Acting General Manager, Utilities and
Environmental Protection,
(403) 268-5733**

CITY OF EDMONTON, ALBERTA

Population: 666,000

Carbon Dioxide Reduction Edmonton (CO₂RE)

CO₂RE is the City of Edmonton's local action plan to reduce greenhouse gas emissions (GHG) and is part of the city's commitment to Partners for Climate Protection. A steering committee of 20 members from the private sector, the municipal government and community groups developed the action plan to reduce GHG emissions in every sector of the city—industrial, residential, and commercial. Action items for each sector were produced, and one of its first outreach programs involved 400 municipal employees taking advantage of the federal Office of Energy Efficiency's EnerGuide for Houses home audit program to reduce GHG emissions. CO₂RE has estimated that an eight-year investment of \$23 million to implement the full plan will save the city \$40 million by 2012.

**Contact: Mark Brostrom,
Environmental Engineer,
(780) 496-5992**

CITY OF HAMILTON, ONTARIO

Population: 503,000

Vision 2020: Building a Strong Foundation (BASF) Phase I

The City of Hamilton's BASF linked four strategic plans into one framework that considers all economic, social and environmental elements. The framework provides a consistent foundation for all new policies and actions by the city, and helped streamline nine "directions" for change—among them, land-use planning, greenspace and rural area protection, and expanded transportation options—that were developed by the community and formally adopted by council. Before adopting BASF, the city's strategic planning process was isolated and often focused only on the benefits relevant to one department or program. Today, an interdepartmental team works co-operatively on projects, maximizing the use of staff and financial resources as well as making better use of volunteer time from the city's stakeholder groups.

Contact: Linda Harvey,
VISION 2020 Co-ordinator,
(905) 546-2424

CITY OF NORTH VANCOUVER, BRITISH COLUMBIA

Population: 45,000

City of North Vancouver's Official Community Plan (OCP)

The City of North Vancouver's 2002 OCP was a significant departure from its 1992 plan, which was primarily used as a land-use planning document. Over the decade between plans, the city had adopted many sustainable policies and actions, so the new plan reflects this change in approach and direction. City staff first prepared a series of background papers that addressed the city's key issues, and then held extensive public consultations, which attracted hundreds of residents. The OCP has resulted in many new city practices, from sustainable development guidelines for developers, such as green building practices, and a sustainability indicators and monitoring program.

Contact: Paul R. Penner,
Planner,
(604) 990-4207

CITY OF OTTAWA, ONTARIO

Population: 800,000

Ottawa 20/20 Growth Management Strategy

When 11 rural and urban municipalities were amalgamated in 2001 to form the new City of Ottawa, the city took advantage of the opportunity to take a more integrated approach to planning. Ottawa 20/20 is the result of an intensive two-year community consultation process that combined five growth management strategies. The consultation process focused on smart growth principles rather than the sheer mechanics of municipal planning. Ottawa 20/20 linked all of the city's strategic priorities and has helped shaped long range financial and community planning. Some of its key features include a focus on compact urban development that would limit urban sprawl and make growth "pay for itself," providing efficient public transportation, and preserving and restoring natural areas.

Contact: Ned Lathrop,
General Manager, Planning and Development Department,
(613) 580-2424, ext. 25659



DISTRICT OF NORTH VANCOUVER, BRITISH COLUMBIA

Population: 83,000

Maplewood Eco-Industrial Partnership Project

The Maplewood project is part of the District of North Vancouver's local action plan and combines eco-industrial networking with sustainable community planning. The 300-hectare community will mix commercial, residential and institutional land uses to make better use of its resources. A team of specialists helped the district and its community partners develop ideas and planning strategies, and an implementation strategy is now being prepared. Ideas include cogeneration facilities, energy conservation measures, and the use of excess hydrogen from area industries for alternate fuel and energy production. These measures are expected to reduce electricity and natural gas consumption by 40 and 60 per cent respectively and greenhouse gas emissions are expected to be reduced by 50 per cent.

Contact: Ken Bennett,
Manager – Environmental Services,
(604) 990-2445



MUNICIPALITY OF CHELSEA, QUEBEC

Population: 6,600

Chelsea's Strategic Development Plan

Chelsea's Strategic Development Plan responds to the needs of its citizens and meets provincial requirements.

Educational and training initiatives

under its waste management strategy has reduced residential waste from about half a tonne per person in 1994 to about a third of a tonne per person in 2003. H₂O Chelsea, the plan's water research and monitoring program, includes septic tank cleanouts, wetlands protection, watershed management, and groundwater testing and surveys. Over 600 residents have had their water tested as part of the program. In 2004, volunteers will travel the entire municipality gathering information to provide municipal authorities with the data they need to make informed decision on local water resources. Chelsea was also one of the first municipalities to ban the use of pesticides for aesthetic purposes.

**Contact: Alpin Bourgeois,
Director of Technical Services,
(819) 827-1124**

REGIONAL MUNICIPALITY OF PEEL, ONTARIO
Population: 1,000,000

Managed Competition Process

The Regional Municipality of Peel has saved money by implementing a managed competition process. The process encourages the private sector to compete with public works staff to provide the highest quality services at the lowest cost in a competitive, fair and open environment. The region has saved about \$400,000 from all contracts that have gone through the process—taking into account staff bids versus a vendor's bid. Less tangible benefits include allowing employees to concentrate on core activities and increasing competition among the private sector to lower the overall costs for public works projects. The region believes that its employees are its greatest resource and provides courses and training for staff so that they are able to bid on future contracts.

**Contact: Mitch Zamojc,
Commissioner of Public Works,
(905) 791-7800, ext. 4395**

REGION OF WATERLOO, ONTARIO

Population: 470,000

Planning Our Future: Regional Growth Management Strategy (RGMS)

Managing the pressures for growth while maintaining a high quality of life was the Region of Waterloo's foremost challenge. The region rose to the occasion with the RGMS, a strategic framework that will guide decision-making to the year 2041, a timeframe that far exceeds most official plans. Phase One included a "big picture" assessment and approach that combines intensified growth in urban areas with targeted greenfield development. Phase Two refined these options using an extensive public outreach process. Some initiatives are already well underway, such as the mapping of significant wetlands and a regional scale energy model. The region is also collaborating with neighbouring municipalities to preserve moraine areas through increased source water protection.

**Contact: Larry Kotseff,
Commissioner of Planning, Housing &
Community Services,
(519) 575-4001**

TOWN OF MILTON, ONTARIO

Population: 31,500

Eco-Tech Village Pilot Project: Urban Design Charette

The Town of Milton seized the opportunity to cement its vision of a sustainable urban village by holding a design charette with its private, public, and community sectors. Through workshops and discussion papers, the town had been fine-tuning the concept since 2001. Charette participants were divided into three teams with each team developing practical and realistic options for the "Eco-Tech Village," while bearing in mind the market acceptance and financial viability of the project. Participants reviewed a multitude of options including greenspace, land use, and transportation corridors. Once built, the Eco-Tech Village will be pedestrian-oriented with a balanced mix of energy-efficient homes and businesses, a common urban square, district energy systems, and many other ecologically sustainable features.

**Contact: Mario Belvedere,
Chief Administration Officer,
(905) 878-7252**

SOLID WASTE

CARIBOO REGIONAL DISTRICT, BRITISH COLUMBIA

Population: 66,000

Garbage on the Rocks: Redeveloping an Industrial Site into a Sustainable 3P Landfill

Cariboo Regional District had searched for an acceptable landfill site since 1991. When Gibraltar Mines Ltd. was forced to close its operations in 2001, it approached the regional district with the idea of siting the landfill on a waste rock dump area. Redeveloping an industrial site was cheaper than constructing a new landfill because the area already has roads, a surface and groundwater monitoring system, and a leachate treatment system, which will be used to irrigate reclaimed mine areas. The public-private initiative also addressed the public's concerns about property devaluation and environmental degradation, and there will be no land-use conflicts with wildlife, forestry, agriculture, recreation or future mining activities.

**Contact: Gordon Gillette,
Manager, Administration
(250) 392-3351**

CITY OF MEDICINE HAT, ALBERTA

Population: 52,000

Frac Sand Recycling Project

The City of Medicine Hat has developed a system to reuse a waste project generated by the natural gas industry. When gas wells are “fractured”—a process in which fluid carrying a propping agent is forced into cracks formed by applying hydraulic pressure into a well formation—“frac” sand is created. Instead of dumping the sand, the city devised a system at its landfill to capture, dewater and recycle the frac sand generated by all gas companies operating in southeast Alberta. In the fall of 2001, the city partnered with 3R Sand, which had developed a process to wash and filter silt and clay from the frac sand. This process makes the frac sand suitable for repeated use in fracturing operations, while the separated silt and clay is used as landfill cover.

**Contact: Dave Leflar,
Manager, Landfill and Waste Division,
(403) 529-8172**

CITY OF PRINCE ALBERT, SASKATCHEWAN

Population: 35,000

Solid Waste Management System

A fully compliant landfill facility is the result of a year-long review of the City of Prince Albert's solid waste management system. The new facility consists of contained landfill cells, a leachate piping and treatment system and a material recovery facility. At the facility, the city also composts dewatered sludge from the sewage treatment plant and processes concrete and rubble into gravel for reuse in street maintenance operations. Every tonne diverted to the material recovery facility increases net revenues by \$93/tonne and reduces operating expenses by \$14/tonne, for a net gain of \$107/tonne. The city also switched from using centralized recycling depots to curbside residential recycling pick up. Residential collection results show that participation is almost four times more effective with the curbside system.



**Contact: Gordon Molnar,
Public Works Engineer,
(306) 953-4900**

CITY OF TORONTO, ONTARIO

Population: 5,000,000

Green Bin Program and Yellow Bag Programs

The Green Bin Program for residents was introduced in 2002 along with the Yellow Bag program, for small commercial businesses, to collect, transfer and process source separated organics. New and retrofitted collection vehicles allowed the City of Toronto to switch from single stream to dual stream collection, which in turn reduced the number of vehicle collection passes required on collection days. The organic materials are taken to the city's anaerobic digestion processing facilities, and in 2003 about 33,000 tonnes of organic material were diverted from landfill. The city is also measuring the feasibility of using the methane gas produced at the facility as a renewable energy source and for electricity generation.

**Contact: Katie Tulk,
Senior Analyst,
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**CITY OF WINNIPEG,
MANITOBA**

Population: 630,000

***Easy Access for All: Residential
Recycling Program***

Almost 200,000 apartment residents, community club members, and small business owners that were once served by recycling drop off depots in the City of Winnipeg now enjoy weekly recycling service. The program started in 2001 with flexible service delivery options like blue boxes, carts, and bins. A voluntary program, Easy Access for All has a 90 per cent participation rate. Recycling has increased to 50 per cent in four years and over 36,000 tonnes of waste have been diverted from the city's landfill. The sale of recyclable material accounts for additional city revenues of over \$6 million per year, offsetting the cost of the program to about \$2 per person per year.

**Contact: J. Dan McInnis,
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**REGIONAL MUNICIPALITY OF HALTON,
ONTARIO**

Population: 375,000

Non-Profit Diversion Credit for Reuse Subsidy Policy

The Regional Municipality of Halton's credit and reuse subsidy policy has diverted materials from its landfill, and in doing so has extended the life of the landfill. If non-profit organizations, such as the Salvation Army, Habitat for Humanity, WasteWise, Goodwill, and the Burlington Reuse Centre, did not operate reuse programs, the region would still need to collect and dispose of materials as part of its waste management program. The policy provides up to a \$50,000 credit to non-profit organizations. The region estimates that the program will divert about 8,000 tonnes of materials in 2004, the equivalent of about three and a half weeks per year of landfill capacity saved.

**Contact: Rob Rivers,
Director of Waste Management Services,
(905) 825-6000**

REGIONAL MUNICIPALITY OF PEEL, ONTARIO

Population: 1,000,000

Three Bag Standard Program

The Region of Peel's user-pay garbage system has reduced waste and increased revenues. Residents were provided with free tags and reminded of the three-bag limit in the first phase of the program. In the second phase, any containers or bags over the limit were left behind with an information sticker. In the third and final phase, any household that exceeds the three-bag standard must pay \$1 per garbage tag or be subject to a fine under a municipal bylaw. The program has resulted in increased recycling rates by 9 per cent and decreased the amount of residential waste produced by 11 per cent. In addition, the revenue generated by the selling of recyclable material together with the sale of garbage tags resulted in a net saving of \$49,000 in 2003.

**Andrew Pollock,
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**SUNSHINE COAST REGIONAL DISTRICT,
BRITISH COLUMBIA**

Population: 26,000

Solid Waste Management Plan: A Road Map to Sustainability

Over the next several years, the Sunshine Coast Regional District (SCRD) will use its solid waste management plan to measure how waste management programs impact greenhouse gas (GHG) emission reductions. A 14-member task force, struck by the regional district, is currently reviewing a number of initiatives. These include a bioreactor that would speed up decomposition of materials in landfill cells, a methane gas extraction system that would beneficially use the landfill gas, a redesigned recycling program, yard waste and co-composting projects, and the use of alternate landfill cover. Using baseline figures from 1996, the SCRD estimates that the cumulative effect of these projects will reduce GHG emissions by about 32,000 tonnes annually.

**Contact: Steve Lee,
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SUSTAINABLE TRANSPORTATION

CITY OF BRAMPTON, ONTARIO

Population: 370,000

Environmental Stewardship Program: Focus on Renewable Biodiesel Fuel

The City of Brampton became the first Canadian municipality to switch its entire municipal fleet to biodiesel. All the city's vehicles—including transit buses—use a blend of soybean oil and low sulphur diesel, which allows more oxygen into the fuel, producing a more complete burn in combustion engines and fewer emissions.

According to tests performed by Ontario's Drive Clean Emissions program, the B20 blend (20 per cent biodiesel) reduced emissions by 25 per cent. A B50 blend used in the summer months was estimated to cut emissions by 50 per cent. Brampton is also investigating a blend of ultra low sulphur diesel with biodiesel, which could reduce emissions by up to 94 per cent.

Contact: Dennis Cutajar,
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CITY OF MONTREAL, BOROUGH SAINT-LAURENT, QUEBEC

Population: 1,039,534

Saint-Laurent Commuter Management Centre

The Saint-Laurent Commuter Management Centre is a "one-stop shop" for information on alternative transportation modes. Before amalgamation with the City of Montreal, the City of Saint-Laurent was the second-largest industrial city in Quebec, with 110,000 single-occupant vehicle commuters each day. The Centre's mission is to reduce transportation-related emissions by offering employer programs such as inter-company carpooling programs and "Info-transport" booths at workplaces. The Centre worked with the Metropolitan Transit Agency to install bike racks at Saint-Laurent train stations and to improve public transit service. It has also partnered with the Province of Quebec's transport agency, the Montreal and Laval transit corporations, and numerous private businesses, including IKEA, Nortel Networks, Canada Post, and Bombardier.

Contact: Alan DeSousa,
Mayor of Borough Saint-Laurent, City of Montreal,
(514) 855-6000



CITY OF RICHMOND, BRITISH COLUMBIA

Population: 168,000

Community Mobility Strategy

The City of Richmond's Community Mobility Strategy has improved safety and community transportation choices through a number of projects and initiatives. Richmond's trail strategy plans to move from the simple infrastructure needs of the city-wide trail system to focus on health and community benefits. Seventy-two per cent of residents already use the trail system regularly, and there is strong public support for an improved system. Fifteen of the city's 28 crosswalks were upgraded with better signage and lighting, and between 2000 and 2003 these crosswalks had the lowest number of pedestrian-related accidents. Designated routes, bicycle lanes, improved signage and pavement markings, and parking and storage areas are also planned as part of the cycling strategy.



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WASTEWATER

CITY OF BURNABY, BRITISH COLUMBIA

Population: 194,000

Byrne Creek and South Burnaby Watersheds: Business Surveillance, Inspection and Education Program

The City of Burnaby is saving the lives of coho salmon by removing water pollutants at the source. After five consecutive fish kills in the late 1990s, the city, Environment Canada, and the British Columbia Minister of Water, Land and Air Protection launched an investigation of local pollution sources. Using a combination of inspections and remediation activities the city tracked and then worked to remove pollution sources such as sediments, hydrocarbons, sanitary sewage, waste antifreeze, and oil. Under its education program, the city developed best practices guides for specific business sectors and a geo-database system to track pollution sources, fisheries and water quality data. The program has reduced the mortality rate of coho salmon and increased the number of returning salmon to Burnaby's watershed.

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**CITY OF CHILLIWACK,
BRITISH COLUMBIA**

Population: 70,000

Designing with Nature and Walking the Talk—Water Balance Management and Sustainable Subdivision Design

New subdivision design guidelines have helped the City of Chilliwack integrate stormwater management with land use planning. Chilliwack's sustainable subdivision strategy requires developers to adhere to strict design guidelines—such as new road designs and stormwater detention ponds—that protect the natural water base, property, habitat and water quality. The new designs help control the volume and rate of stormwater runoff and ensure adequate flood risk management, and promote infiltration and rainwater reuse so that rainfall is restored to natural pathways. The guidelines also protect the city from liability issues, and will save money in avoided costs, such as the elimination of conventional “big pipe” solutions and the rehabilitation of watercourses.

**Contact: Dipak Basu,
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CITY OF SARNIA, ONTARIO

Population: 71,000

Stormwater Management Facility

Responding to new residential development in the Perch Creek area, the City of Sarnia enlarged and converted an existing drain into an extended detention wet pond and constructed a new stormwater management facility. The facility manages the storm runoff from the new development and captures and treats the runoff from an adjacent development and a small, decommissioned landfill site, improving the quality of effluent discharged to Perch Creek and Lake Huron. Excavated material was used to create landscape features along an otherwise flat and uninteresting area. A recreational pathway runs beside the facility and a 30-metre long pedestrian bridge across the creek connects the path to a trail system.

**Contact: Peter Hungerford,
Director – Economic Development and
Corporate Planning,
(519) 332-0330**

CITY OF SASKATOON, SASKATCHEWAN

Population: 197,000

Southeast Sector Storm Water Management Master Plan

Increased development on a 450-hectare area southeast of the City of Saskatoon spurred the development of a stormwater management master plan. The area's main feature is a natural wetland. An interdisciplinary team of community and environmental groups, developers, and municipal staff developed the plan to respond to the needs of the new residents while restoring and protecting the wetland. Stormwater that is cleaned through the wetland will increase the quality of the runoff that is ultimately discharged to the South Saskatchewan River, and the wetland will provide additional wildlife and aquatic habitat as well as education and recreational opportunities for residents.

**Contact: W. C. Sexsmith,
Planning and Design Manager,
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WATER

CITY OF MONCTON, NEW BRUNSWICK

Population: 62,000

Watermain Cleaning and Epoxy Lining Project

The City of Moncton's watermain cleaning and epoxy lining project rehabilitated 12.2 km of watermains using a “no dig” technology. Rather than tear up city streets to replace the cast iron watermains, which still had at least 25 years of service, a drag and power boring technique was used to remove the heavy solidified deposits inside the pipes. An epoxy lining was then placed on the cleaned interior. The city ensured that all residents were well-informed of the project—holding a public meeting and hiring a plumber to visit each and every home and business in the affected area. The project eliminated the need to excavate and backfill streets, replace pipes and rehabilitate landscape. In total, almost \$5 million was saved in avoided costs.

**Contact: Kathryn M. Barnes,
Chair, Environment Committee,
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CITY OF SURREY, BRITISH COLUMBIA

Population: 348,000

Serpentine-Nicomekl Lowland Flood Control Project

The City of Surrey's lowlands area often experiences severe flooding during heavy rain events when the Serpentine-Nicomekl watershed overflows. With a capital investment of \$40 million over 10 years, the city will extend existing dykes, improve stormwater conveyance, and upgrade or construct new pumping stations. The city upgraded 70 km of existing dykes and worked closely with the agricultural community to create rights-of-way so that overflow waters drained properly. Soil-bearing strength, rooting depth, aeration and soil temperature were all improved as a result. With agricultural activity occurring on about 70 per cent of the lowlands area, the flood control project has had an extremely positive impact on Surrey's farming production.

**Contact: Paul Ham,
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GREATER VANCOUVER REGIONAL DISTRICT (GVRD), BRITISH COLUMBIA

Population: 2,000,000

The Little Mountain Reservoir Reconstruction

The Little Mountain Reservoir is the GVRD's largest and most important reservoir, but investigations during the 1990s found that the reservoir was not earthquake proof. To provide greater public safety and ensure a reliable drinking water supply, the GVRD demolished and reconstructed the reservoir. A new double roofing membrane minimizes water quality concerns and the reservoir was constructed with EcoSmart™ concrete, an environment-friendly concrete that uses less fly ash in its production. The new reservoir can withstand a maximum credible earthquake, has a 100-year service life and was built within the footprint of the old reservoir to minimize impact on surrounding park areas, and animal and plant life.

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REGIONAL MUNICIPALITY OF HALTON, ONTARIO

Population: 375,000

Water Meter Change Out Program

The Regional Municipality of Halton's water meter change out is a three-year program to replace gear-drive and gallon meters with cubic meter water meters and remote readers in 35,000 residences. Using remote readers eliminates estimated billing and the cost of inspectors entering homes to read meters, and customers will no longer need to call in water readings. The program ensures that all customers contribute equally to financing the water and wastewater system operations. Water conservation initiatives were also a part of the pilot program. One-third of the homeowners contacted installed early closing toilet flappers and low-flow showerheads that reduced water use, while more than three-quarters accepted other water-saving devices, such as faucet aerators.

**Contact: Bob McMurray,
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STRATHCONA COUNTY, ALBERTA

Population: 72,000

Regional Water Customer Group (RWCG)

The RWCG consists of 45 municipalities in the Capital Region of Alberta. Prior to 1995, EPCOR Water, the region's bulk potable water provider, had sole responsibility for monitoring water use and rates and billed each municipality individually. The first objective of the RWCG was to draw water from EPCOR at one customer class at a constant draw rate. Strathcona County is the RWCG liaison with EPCOR and is responsible for all monitoring, reporting, and system planning. Monitoring rates ensures accurate data and resulted in a \$551,000 rebate from EPCOR. This co-ordinated effort has increased water conservation and reduced power consumption requirements among all RWCG members and ensures that any reservoirs that may be experiencing low levels during dry spells have adequate water supplies.

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**TOWNSHIP OF LANGLEY,
BRITISH COLUMBIA**

Population: 87,000

Water Wise Public Education

Program for Sensitive

Groundwater Areas

Due to its heavy reliance on groundwater, the Township of

Langley initiated Water Wise, a door-to-door outreach program to educate and motivate residents to protect and conserve the drinking water supply. The value of the township's municipal water supply is about \$1.2 million and cost savings are expected in the long term from conservation measures and reduced sanitary treatment costs associated with less municipal water use. After receiving groundwater and conservation training, 24 volunteers visited homeowners with customized booklets of practical information. Over 2,000 households had been contacted by the end of 2003. The results of a survey conducted with these residents will guide future program planning and policy development.

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