

Smart Initiatives:

Building
Municipalities
of the Future

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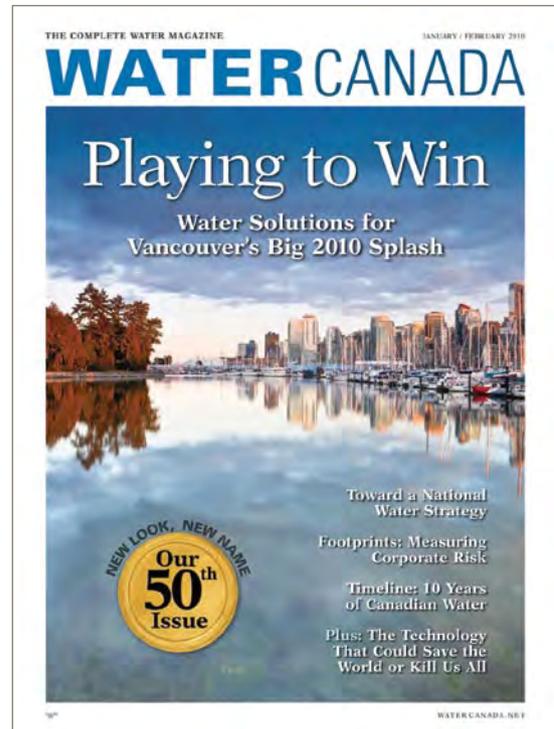


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The Infrastructure Renewal Magazine

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Smart Initiatives: Building Municipalities of the Future

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Funding Innovation

Through the Green Municipal Fund™ (GMF), the Federation of Canadian Municipalities (FCM) is proud to have supported some of the best green initiatives in Canada.

The Government of Canada endowed FCM with \$550 million to establish the Fund and, since 2000, it has been a long-term, sustainable source of grants and below-market loans for municipal governments and their partners. As we turn the corner of our tenth anniversary at GMF, we are pleased to highlight 10 excellent initiatives we have had the privilege to support. These initiatives—from large and small municipalities across Canada—are delivering significant environmental benefits, along with real economic savings and social benefits to their communities.

GMF provides below-market loans and grants, as well as education and training services to support municipal initiatives that improve air, water and soil quality, and protect the climate. Grants are available for sustainable community plans, feasibility studies and field tests, while a combination of grants and loans are available for capital projects. Funding is allocated in five sectors of municipal activity: brownfields, energy, transportation, waste and water. We share the lessons learned and expertise gained through these initiatives and provide training to encourage other communities to replicate their success.

To date, FCM has committed more than \$400 million to support over 730 sustainable community plans, feasibility studies, field tests and capital projects. GMF-funded initiatives have the potential to leverage almost \$2.2 billion of economic activity in nearly 350 communities across Canada.

We have consulted with stakeholders on how to improve our funding opportunities and we are making some significant changes that respond to the input we received. We have removed all deadlines to apply for grants and below-market loans for capital projects. Municipal governments and their partners can now apply whenever it best fits into their project cycle. We are also streamlining our application process to ensure shorter review and approval times, and we are revamping our application documents to be simpler and easier to complete.

In the current economic climate, GMF funding can play an important role in kick-starting municipal stimulus projects and other green infrastructure initiatives. Many of the new federal programs aimed at infrastructure require cost-sharing from municipalities and this provides another opportunity for us to help—GMF funding is stackable against federal funding and can be considered as the municipal share for eligible infrastructure projects.

Enjoy these examples of some of the best GMF-funded initiatives—proof positive that we are here and ready to help Canadian municipalities achieve their sustainability goals in 2010 and beyond.

Basil L. Stewart
President, Federation of Canadian Municipalities
Mayor of Summerside, P.E.I.

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Sectors Legend



brownfields



energy



planning



transportation



waste



water



Dockside Green: Brownfield to Sustainable Development

City of Victoria, British Columbia

Population: 78,057

Project Cost: \$930,000

GMF Support: \$350,000



“The inner-city brownfield development has become a tourist attraction all of its own, welcoming visiting government organizations and developers from all over the world.” —Stephanie Thatcher, Vancity

OVERVIEW Dockside Green is a 6.05-hectare former brownfield located in the heart of the City of Victoria. Owned by VanCity, the site is being developed as a model sustainable community, built to LEED®-Platinum guidelines. At build-out, Dockside Green will house approximately 2,500 residents in 1,100 dwelling units and contain about 1.3 million square feet of mixed residential, office, retail and light industrial space.

The site is helping Victoria to meet a number of goals: balancing economic prosperity, social development and environmental sustainability in all municipal activities; encouraging more growth in its centre through urban intensification and brownfield redevelopment; and developing brownfield lands with a triple bottom line approach.

Financial Benefits

Return on investment is difficult to measure as the project is in relatively early stages. Thus far, developers have reduced costs by choosing more efficient water and energy fixtures, which, while more expensive upfront, have downsized the sewage treatment plant by 50 per cent, dramatically reducing capital and operating expenses. Through a combination of efficiency measures, the Phase I buildings have achieved 53 per cent energy savings over the requirements of the Model National Energy Code for Buildings (MNECB).

Environmental Benefits

Dockside Green is striving to be the first greenhouse gas (GHG) neutral development from a building energy perspective and the first community ever to target LEED-Platinum certification for buildings developed in a master-planned community. Developers have backed up this commitment with a potential penalty of up to \$1 million

(\$1 per buildable square foot) payable to the municipality if the development does not obtain the LEED-Platinum designation for each building.

Reduced energy and water demands have limited the development's impact on municipal infrastructure. The completed project will save more than 70 million gallons of water, reducing water demand by 67 per cent, and will not require use of the municipal sewage or stormwater systems. In addition, 95 per cent of construction waste was diverted from landfill.

Lessons

VanCity, the project's developers, expressed four fundamental lessons learned in relation to the Dockside Green Project: work closely with all stakeholders, use a systems approach, obtain financial support for the development of sustainable infrastructure, and engage the community in the planning and design process.

By collaborating closely with all stakeholders, the team obtained the municipality's agreement not to charge residents for the sewage component of their water bills. A systems approach was crucial for identifying synergistic and innovative design opportunities, and to prevent delays in development of sustainable infrastructure. Mark Hornell, manager of the community planning division for the City of Victoria, says, “The Municipal Finance Authority of B.C., the province's central borrowing agency for the financing of municipal capital requirements, may have a key role to play in supporting these kinds of projects in their early stages. Open lines of communication meant that there was no opposition to development plans at rezoning, community and development permit meetings.”

Future

Dockside Green has given the City of Victoria a model for future sustainable development. The City is now in the process of developing the Victoria Sustainability Framework, which will build on existing planning documents to provide a comprehensive vision for long-term community planning and the greening of municipal operations. The framework will identify existing sustainability initiatives and prioritize areas where further work is needed—areas as diverse as waste collection, procurement policies, bicycle sharing and stormwater management.

VanCity is optimistic that the systems at Dockside will apply in other developments.



Street Sand Recycling Pilot Project

City of Edmonton, Alberta

Population: 730,372

Project Cost: \$6.6 million

GMF Support: \$618,923



“The recycled product is cleaner than new sand. It’s actually a superior product for less money.”

—Bob Dunford, City of Edmonton

Financial Benefits

“Our best hope was to break even, but we’re ahead of that,” says Bob Dunford, general supervisor with the City of Edmonton. Recycling street sand used for traction in winter has saved the City of Edmonton \$4.5 million, and the resulting product, recycled street sand, is suitable for reuse at a cost below market value for new material—it saves the City about \$1.75 per tonne.

Environmental Benefits

The Sand Recycling facility at the City of Edmonton’s Poundmaker Snow Storage site can process up to 150,000 tonnes of used street sand, removing contaminants such as salt, hydrocarbons and harmful materials. All but two per cent of sand is diverted from landfill. The process recovers up to 70 per cent of the material for reuse as traction aid for the following winter. This translates into an over 20 per cent reduction in total material landfilled.

Related benefits include reduced mining of virgin sand deposits, reduced fuel consumption, and related impacts of long distance trucking of sand.

Lessons

Spurred by new provincial regulations, the initiative offers an excellent example from which other Canadian municipalities can learn. Many municipalities share Edmonton’s challenges—increased growth, high disposal costs, filling landfills. Now they can share in its solutions.

Innovation

The pilot’s goal, in part, was to showcase ingenuity and offer valuable new knowledge for Canadian municipalities. And it succeeded. The new top-of-the-line facilities employ sophisticated waste handling systems while also providing space to conduct expert research into new waste processing technologies.

Future

Recycling has caught on in a big way in Edmonton—and the movement is expected to grow. A major electronics waste recycling facility is currently under construction at the Edmonton Waste Management Centre that will complement Alberta’s two- year-old electronics recycling legislation. The new facility is expected to process between 12,000 and 15,000 tonnes per year of e-waste. The branch has also set its sights set on graffiti management and increasing recycling among city businesses.

OVERVIEW This ten-year pilot has four major processing functions: primary processing of waste and recyclable materials where street sweepings are separated into three streams—litter (plastics, paper, wood, etc.), large aggregates (stones, etc.) and fine sands that continues to the washing system; sand washing and fine sand removal; fine sand recovery and de-watering; and final product stockpiling.

The large aggregate material is blended with crushed concrete and asphalt to produce base coarse aggregates used in roadway construction and maintenance programs. Plastics, paper and other non-aggregate materials are transferred to the City’s on-site composting and recycling facilities or landfilled as appropriate. The system has been designed for low energy and minimal water use and has a high potential for replication.

This initiative earned the project team the Transportation Association of Canada’s Environmental Achievement Award in 2004.



Centre in the Park (CITP) District Energy Strathcona Strathcona County, Alberta

Population: 82,511

Project Cost: \$7.84 million

GMF Support: \$55,000 (for initial feasibility studies)



resources. Buildings served by the Community Energy System now convert fuel at 80 per cent efficiency (versus the 65 per cent range typical of commercial-grade boiler systems). Fewer boilers and higher efficiency help to reduce the emissions profile of these buildings.

Innovation

While the technology of a central heating energy source has been around awhile for use in institutions, Strathcona County is the first community in the region to have a Community Energy System. The system has also been designed to support future conversion to newer, more efficient technologies and non fossil fuels, such as municipal waste, bio-fuels and surplus heat from an industrial source in Strathcona County.

The building's efficiency, innovation, stormwater management system, and low site disturbance, among other factors, earned it a LEED-Silver rating.

Lessons

Build-out of the residential and commercial components of Centre in the Park has slowed considerably due to the recent recession, resulting in a slower than anticipated customer connection rate. It is important to have a critical mass of customers, both to meet business objectives and to enable the system to work at maximum efficiency.

To attract customers in a market-based system, pricing has to be as good as or better than traditional heating. The County operates a gas-on-gas system and relies on fuel conversion efficiency and load diversification to offer value to its customers. Incorporating cogeneration or supplementing natural gas with a biomass fuel input would allow the system to achieve greater economic and environmental benefits.

Future

This system will be used as a model of sustainable development for future projects and policy development. Other County-owned buildings following the Energy Centre are now being built to LEED-Gold certification.

The county plans to explore alternative fuel sources, such as biomass, the municipal waste stream, and waste heat from industry or hydrogen. Electrical cogeneration, commonly referred to as combined heat and power (CHP), is a possibility. The county may also consider extending its system to other sites, such as Emerald Hills Urban Village (a new sustainable community under development with support from FCM's GMF) or the local hospital.

OVERVIEW Centre in the Park will be Strathcona County's first comprehensive sustainable community. Slated for development over the next few years, it will be a multi-use area comprising of residential buildings, retail services, walkways, a central plaza and public spaces. The vision is to create a pedestrian-oriented centre for Strathcona County within the heart of Sherwood Park that is focused on recreational, cultural, government and business activities and that encourages year-round use. Community design principles, including the triple-bottom-line approach and inclusion of a community energy system and a community centre, will be applied.

The 3,300-square-foot Energy Centre—the hub of the district energy system—was designed to complement the architectural style of Centre in the Park.

Financial Benefits

While building owners will realize benefits immediately, the County's investment is longer term. "The system has a 15- to 20-year payback," says Jeff Hutton, manager of Strathcona County's utilities department.

Environmental Benefits

Strathcona County's energy-efficient system reduces GHG emissions by 18 per cent (1,100 tonnes/year) when compared to traditional heating systems. It saves on energy costs, and conserves

Credit: Strathcona County

Drake Landing Solar Community

Town of Okotoks, Alberta



Credit: NPCan

Population: 17,145

Project Cost: \$4.5 million (solar seasonal energy storage and district energy system); \$2.2 million (supporting infrastructure and energy efficiency measures in homes); \$0.8 million (implementation problems and weather-related challenges).

GMF Support: \$2.58 million (grant amount); \$300,000 (loan amount)



Environmental Benefits

It is estimated that this community could reduce GHGs by five tonnes per year per house.

Innovation

The application of solar seasonal energy storage has never been done in North America. This type of project has been realized in several European countries over the past couple of decades, but with 50-65 per cent of each building's seasonal energy requirements met by solar energy devices (this community is designed to reach 90 per cent).

Lessons

Quail says additional slack should be built into the project timeline to allow for poor weather or labour interruptions. In addition, an integrated design approach was a key component in the implementation of new and innovative technologies and concepts. National and international technical support was critical for project implementation. Outside experts can provide advise and insight which can be invaluable to the project.

Future

"The Drake Landing Solar Community project was meant for technology demonstration and technology R&D," says Quail. "Through the learning experience and the knowledge gained from the first two years of operation, it has been demonstrated that the solar seasonal storage technology can work in Canada."

Replication potential is extremely high for projects of this kind, albeit with variations and potentially integrated with other technologies. However, the design and implementation of communities typically falls outside the responsibility of municipal governments. Municipal governments can be the catalyst or facilitator for many sustainable neighbourhood designs and help the project partners in working towards achieving LEED-Neighbourhood certification.

This development has motivated the Town of Okotoks to continue with additional alternative energy initiatives within its corporate facilities and has set precedent for the Town as community leader in environmental stewardship. The Town has also committed to purchasing 80 per cent of its energy from renewable energy sources, becoming the first Alberta municipality to purchase this high a fraction of green energy. At the end of 2009, the Town also implemented a Building Permit Rebate Program for Commercial, Industrial and Institutional Buildings that achieve various levels of LEED certification.

"We've been told it's the most ambitious solar project in the world." —Keith Paget, Sterling Group of Companies

OVERVIEW This 52-home seasonal solar district heating demonstration project is based on a European concept that the Technology for Early Action (TEAM) program of Natural Resources Canada wanted to test. The homes in the subdivision will get approximately 90 per cent of required heat and hot water from a district thermal solar heat source.

The project incorporates the key principles of the Town of Okotoks' sustainable development vision. The project, however, was not the catalyst towards sustainable development for Okotoks—the community had already created and implemented a sustainable Legacy Plan in 1998, which led to Okotoks being chosen for this unique R&D project.

In 2005, the Town of Okotoks was presented with a Gold Award in the Environmentally Sustainable Project section of the International Awards for Liveable Communities (LivCom) program, which is endorsed by the United Nations Environment Programme. In 2006, Okotoks won the FCM-CH2M HILL Sustainable Communities Award for Energy/Renewable Energy. In 2007, it won the CanSIA 2006 Solar Awards for Solar Thermal Project of the Year for the Drake Landing Solar Community.

Financial Benefits

The cost included a significant amount of one-time research and development that would not be necessary if the initiative was replicated in another community. "It would cost \$4 million if we did it again somewhere else," says Bill Wong, project manager at SAIC Canada and the project lead for Drake Landing.

Given the current natural gas price, for solar seasonal energy storage to be economically feasible, the technology needs to be implemented on a much larger scale (hundreds of homes instead of only 52) and integrated with other complementary technologies. "As the price of fossil fuel increases, the financial returns on this type of technology will be more attractive," says Okotoks municipal manager, Rick Quail.

Port Hawkesbury Civic Centre

Town of Port Hawkesbury, Nova Scotia

Population: 3,517

Project Cost: \$17.3 million

GMF Support: \$1.1 million (grant amount);
\$900,000 (loan amount)



Credit: Strait-Highlands Regional Development Agency

OVERVIEW This LEED-certified building is the centrepiece of renewal for Port Hawkesbury and its surrounding community of 30,000. It contains an NHL-size ice surface, a walking track around the perimeter of the ice surface, a convention centre for business seminars and other social functions, a crafts and quilt centre for promoting local artisans and a fitness centre.

Financial Benefits

The Town estimated that the energy savings from these initiatives would be \$117,750 per year, making the payback from these energy efficient upgrades 16.9 years. The forecast is based on constant energy pricing and is relative to a reference building that meets the MNECB.

The new Port Hawkesbury Civic Centre represents a 67.3 per cent energy reduction over the building it replaced. The reference building's total MNECB energy cost for all energy sources is \$211,852 and the building is total energy cost for all energy sources is \$89,007. That brings the total annual energy savings to \$122,845.

Environmental Benefits

Energy consumption will be reduced to less than 50 per cent of the reference building that meets the MNECB. In addition, there will be a significant reduction of carbon dioxide (CO₂) intensity. The new building has a footprint of 78.8 kilograms (kg) of CO₂ per square metre (m₂) while the old facility had a footprint of 296.4 kg of CO₂ per m₂.

Innovative

This is the first community centre in Atlantic Canada to use a Green Protocol to guide the designers in adopting best practice for material selection, and energy and water consumption (both less than half of traditional buildings). The building may be eligible for LEED-Platinum or five green globes out of five from Green Globes Canada. It's also the first arena in Atlantic Canada to use daylighting (with the locally-developed

Solera translucent glazing system). It's also the first to use a horizontal closed-loop heat exchanger to reject to the parking lot and adjacent sidewalks as a heat sink for excess energy, and the first to potentially provide heat for another building to reduce energy loads and save GHGs.

It's the second community centre in Atlantic Canada to use the Ice Kube system to provide ice in the arena (using a thermal cold storage in the rink slab) and heat in the rest of the building through the use of the condensing water waste heat for the radiant heating system in the seats and the floors of the building. This Canadian-developed system uses multiple chiller/heat water-to-water heat pump modules.

Lessons

The Port Hawkesbury Civic Centre was built through construction management as opposed to using a general contractor. This meant that it was more difficult to mitigate the risks involved with a project of this size. Strait-Highlands Regional Development Agency's John Beaton says, "As a general suggestion to others wanting to take on a project such as this, don't be reluctant to challenge a statement which is made for reasonableness and common sense."

Future

The success of this project led the municipality to implement a policy requiring that all new municipal buildings be built to LEED guidelines, and all retrofits be consistent with LEED for existing buildings.

When the project was underway, Strait-Highlands Green Action was a new undertaking. The Town of Port Hawkesbury was undergoing an energy and emissions inventory under the initiative (milestone one of the Partners for Climate Protection program). In the spring of 2009, considering the energy savings that the Civic Centre offered and role those savings played in stabilizing municipal taxes, Town Council voted in favour of implementing LEED-Silver design for all new municipal buildings by 2015 and LEED-Gold by 2020. The Strait-Highlands RDA are currently working closely with Town of Port Hawkesbury Staff to retrofit five municipally-owned buildings.

Many arenas in Canada will require major refurbishing in the coming years and this project could be replicated in any community—in fact, Beaton recently conducted a successful webinar presentation (hosted by FCM) to municipal leaders and stakeholders across the country on the sustainable planning they've done.



Waterloo Regional Police Headquarters

Regional Municipality of Waterloo, Ontario

Population: 405,435
Project Cost: \$11.6 million
GMF Support: \$3 million (loan amount)



OVERVIEW The Waterloo Regional Police (WRP) Headquarters Expansion houses the Investigative Services Branch, including a forensics laboratory and vehicle examination garage, meeting rooms, office space and ancillary support rooms. The new 3,700 m², three-storey building is designed and constructed to reduce energy consumption by 60 per cent below the MNECB and to obtain LEED-Silver certification. The project utilizes four strategies to achieve exceptional energy efficiency results: load avoidance, heat recovery, use of renewable energy sources and high equipment efficiency. The working environment will be enhanced through daylighting and improved indoor air quality.

Financial Benefits

Energy conservation measures during design and occupation are expected to lead to energy cost savings of over \$40,000 a year, compared to the baseline building that meets MNECB standards—60 per cent in energy cost savings will reduce annual energy costs from \$78,465 to \$29,962. Additionally, the facility used a significant amount of regional materials, and the design and construction team were local companies, which both benefit the local economy.

Environmental Benefits

The energy efficiency of the building will be significant. Annual GHG emissions are reduced by 144 tonnes, and potable water consumption by 20 per cent.

Innovation

The design and construction of this building were innovative in the use of heat recovery—even for areas that require 100 per cent fresh air, heat was recovered from exhaust air, resulting in significant energy savings. This was accomplished by using energy recovery ventilators, which reduced the energy required to heat and humidify the building, and reduced the energy required to cool and dehumidify the building.

Future

After the first regional LEED project, staff reported to Regional Council to identify benefits and associated costs. This report developed into a regional policy that new construction projects over 500 m² must be designed and constructed to LEED-Silver guidelines. Subsequently, several regional construction projects have been designed and built to these requirements. To date, the Region of Waterloo has two LEED-Gold certified buildings, two completed buildings awaiting LEED-Silver certification, more LEED buildings under construction, and several more in the design stages. The success of this project added strength to the Region's goal for sustainable growth and construction.

York Rapid Transit: Quick Start

York Region, Ontario



Population: 943,510

Project Cost: \$30 million (preliminary engineering); \$150 million (initial Quick Start phase)

GMF Support: \$200,000 (grant amount)



Credit: York Region Rapid Transit Corporation

carbon dioxide emissions by 2012 by over 120,000 tonnes per year by shifting passengers from automobiles to public transit; if this reduction is valued at \$50 per ton, this is equivalent to a benefit of \$6 million per year. Airborne emissions of other pollutants will be similarly reduced. Rapid transit will enable more efficient land use patterns by providing mobility support to multi-use, compact urban developments, thus taking pressure off irreplaceable natural resources such as the Oak Ridges Moraine and prime agricultural lands.

Innovation

VIVA was launched in record time through an innovative public-private partnership—the first of its kind for a major transit infrastructure project in Canada. Twelve months later, total transit boarding along the rapid transit corridors was running 39 per cent ahead of the previous year and service ratings indicated that the system was exceeding customer expectations. By creatively combining an innovative package of BRT technologies, VIVA is providing the increased coverage, shorter wait times, faster service and increased value that is necessary to make public transit more competitive with the private automobile.

Lessons

Change must be made over time. The VIVA BRT system is the first component of a 20-year public transit plan involving dedicated transitways and light rail service. By implementing the plan in stages, the VIVA system immediately improved air quality and traffic congestion, while subsequent developments awaited environmental assessments and funding. For a fraction of the cost of light rail, the BRT system paid social and environmental dividends and spurred transit-oriented development in emerging urban centres.

Future

To date, the project team overseeing the development and implementation of the Viva Phase 1 project has been asked to share best practices with jurisdictions around the world by making presentations and submitting articles to a variety of associations, forums and publications.

The second stage of the transit program, involving the construction of dedicated transitways along the busiest sections of the corridors, is underway. Innovative community planning, architecture and landscaping are being used to create pedestrian-friendly, car-free downtown neighbourhoods such as Markham's Simcoe Promenade. The third stage of the program will incorporate light rail transit and extend the existing TTC subway network.

OVERVIEW The project aims to develop compact, mixed-use communities around the four urban centres linked by the transit network. Compact housing developments and condominiums, along with recreational, cultural and commercial facilities, are planned to provide homes and employment opportunities within walking distance of the transit system. According to the Region's Official Plan, future growth is to be concentrated within four emerging urban centres in Vaughan, Markham, Richmond Hill and Newmarket. Rapid transit was identified as the primary means of managing such growth.

Financial Benefits

The first phase of VIVA (York Region Transit) was successfully implemented within three years (less than half the time it would normally take for a similar infrastructure project in North America). Having a single, all-purpose private-sector partner for VIVA Phase 1 has saved York Region at least three years of overhead costs, staffing costs, and other related expenses.

York Consortium has also contributed to the program through the provision of professional services on a pro-bono basis. The partnership has accelerated benefits to the riders and people who live and work along the transit corridors in terms of faster travel times, reduced traffic congestion and lower fuel costs. These benefits alone, quantified through the Transport Canada cost-benefit model, are approximately \$40 million per year.

Environmental Benefits

Transit ridership along the rapid transit corridors has increased by more than 35 per cent in less than one year after the VIVA BRT program began.

The environmental benefits of implementing rapid transit cover a broad spectrum and will be both immediate and long-term. As a contribution to Canada's Kyoto commitments, YRTP will reduce



Sam Lindsay Memorial Pool Retrofit

District of Kitimat, British Columbia

Population: 8,987
Project Cost: \$13.8 million
GMF Support: \$1.5 million (loan amount)



Originally built for children and vigorous sport, all aspects of the pool were modified to accommodate the growing elderly and accessible-challenged population. The entire complex is now accessible to all, from private family change rooms to water tanks which provide exercise and recreation enjoyment for elderly, accessible-challenged, children, and traditional athletics.

Financial Benefits

The annual energy savings is approximately 7,191 gigajoules (GJ) or \$96,600 (in 2004 dollars) of natural gas consumption. Cost reductions also factor in the increase in annual electrical consumption, estimated at 536,391 kilowatt hours (kWh) or \$32,700 per year. The cost of this new installation was \$493,000 with an estimated payback period of about eight years. Annual energy savings from low-flow showerheads alone are estimated to be 395 GJ or \$5,300 (2004 dollars) of natural gas consumption.

Environmental Benefits

Kitimat introduced a heat recovery system to recover the significant waste heat from the ice plant in the adjacent arena and put it towards the significant heat and energy requirements of operating the pool complex.

The system uses waste heat generated by a nearby ice arena to heat pool water, showers, and washrooms and for space heating. The low-flow shower heads reduce the amount of water consumed during shower operation, while energy-efficient lighting fixtures, boilers, pumps, lighting and machinery timers and insulation save energy.

The retrofit decreases the consumption of natural gas from 10,760 GJ annually to 2,744 GJ. Existing facility operations release 591,635 kg of carbon dioxide equivalents (CO₂e), whereas the retrofitted facility has associated GHG emissions of approximately 149,930 kg of CO₂e per year.

Innovation

Recent innovations in the heat recovery field have led to very efficient reverse flow heat recovery units that will result in cost savings and have an estimated payback of eight years.

Lessons

The District of Kitimat would have chosen to use a general contractor for the project. This would have likely reduced cost of the project and allowed it to be completed closer to the scheduled construction completion date.

OVERVIEW The District of Kitimat recently retrofitted a pool facility using energy-saving measures to reduce natural gas consumption and GHG emissions. The retrofit adds an additional 585 m² to the existing building and includes new water, electrical and mechanical systems.

“The renovation was part of an overall municipal strategy to provide intergenerational and accessible recreation and cultural facilities to the community,” says Trafford Hall, a manager with the District of Kitimat. “A necessary operational renovation became an upgrade to a meet the changing demographics of a very young town,” he says.

Credit: District of Kitimat

Corner Brook Wastewater Treatment Feasibility Study

City of Corner Brook, Newfoundland and Labrador



Population: 22,000

Project Cost: \$2 million

GMF Support: \$1 million (grant amount);
\$600,000 (loan amount)



Credit: Corner Brook EDC

“In many cases, Corner Brook is far ahead of municipalities, many larger in size, when it comes to dealing with some of these issues.”

—Mayor Charles Pender

OVERVIEW This project consists of two components: water consumption and loss reductions and water quality improvements. The City proposes to install full Commercial/Industrial water metering and a residential water metering pilot project. These initiatives will support the existing leak management program and move the city towards universal metering. In order to ensure disinfection in the water distribution system, the City proposes to “loop” the dead ends in the system and to install automatic flushing devices. These projects will supplement the current water loss and water quality issues in the City. Water loss issues are currently being addressed by a comprehensive leak management strategy. Water quality will be improved with the proposed new water treatment plant.

Financial Benefits

It's too early to tell what the benefits of this study will be, but the efficiencies created by this project's careful planning will certainly pay off in cost savings.

Environmental Benefits

The environmental benefits from the proposed water rehabilitation program and water metering efforts will include improvements to the community water quality conditions and overall reduction in water leak loss of approximately 10 per cent. The water metering program for commercial and residential consumers is expected to reduce consumption by 25 per cent. Direct environmental benefits also include reduction of oversized infrastructure, energy costs, and reduced flows to wastewater stream.

The installation of flushing devices and reduction of dead ends will also improve human health parameters and reduce boil order occurrences.

Innovation

At a National Board of Directors meeting of the Federation of Canadian Municipalities in September 2009, Mayor of Corner Brook, Charles Pender said, “There was significant discussion in the Environment and Infrastructure Committee meeting on climate change, new wastewater regulations and solid waste management. What was interesting was to see how municipalities are working to ensure that municipal governments are viewing infrastructure projects through an environmental lens. In many cases, Corner Brook is far ahead of municipalities, many larger in size, when it comes to dealing with some of these issues.”

Lessons

Separating the various basins into different groups was found to be the most cost-effective way to treat the sewage, as some could be treated through diffused outfall.

The program includes promotion of stewardship.

Future

The information and the various treatment methods reviewed for this study could be applied to smaller communities—those with up to 5,000 people could use similar holding tanks or septic tanks for solids removal together with diffused outfall.

Mayor Pender said, “It was not surprising to find that municipalities from all across the nation are facing the same issues as we are here in Corner Brook. Corner Brook is at the forefront of many of these types of projects and we actually have the opportunity to share our experience with other municipalities from all over the country.”

Malartic Brownfield Site Assessments

Town of Malartic, Quebec



Population: 4,154

Project Cost: \$66,684

GMF Support: \$33,342



Whereas before, these sites created social and economic problems in the surrounding neighbourhoods, they can now be developed.

OVERVIEW The Town of Malartic conducted Phase I, II and III Environmental Site Assessments (ESAs) on two vacant properties. The abandoned lots were originally a gas station and commercial garage. Before moving forward with remediation, the Town had to address concerns that the contamination had spread to the groundwater and to soil on adjoining properties. The ESA found that the soil and groundwater at both sites were contaminated with petroleum hydrocarbons and Phase III was deemed unnecessary—rather, the Town moved directly to Phase IV of the plan: remediation.

Financial Benefits

Once remediated, these lands become more than vacant lots, they become a part of the town's economic development. Whereas before, these sites created social and economic problems in the surrounding neighbourhoods, they can now be developed.

Environmental Benefits

Contaminated soil and groundwater is a health risk. Groundwater on these sites fed into the town's wells, with potentially dangerous repercussions for residents. Remediating these lands neutralized that risk.

The environmental quality of the soil and groundwater now meets ministère du Développement durable, de l'Environnement et des Parcs du Québec (MDDEP) standards for institutional, residential or commercial development.

Lessons

Project managers would encourage other communities to complete the Phase III assessments—a better understanding of the extent and nature of the contamination would have allowed the Town to more accurately estimate project costs. In this case, contamination was deeper than initially estimated, which led to supplementary costs—costs the Town accepted because of the immense social and environmental benefits to be gained from this remediation.

Another lesson for any community looking to recreate this ESA and remediation: collaborate. The Town found that cooperating with the ministry of the environment was key to the project's success.

Future

The final report, released in 2008, shares the Town's experience, answering questions other communities facing a similar undertaking will certainly have.



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Prince Rupert Container Terminal Development
\$770 million Prince Rupert, BC

26

Woodstock General Hospital
\$685 million
Woodstock, ON

30

East Toba and Montrose Run of River Project
\$660 million Powell River, BC

51

Sydney Tar Ponds Cleanup
\$400 million
Sydney, NS

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Top 100

Canada's Biggest Infrastructure Projects



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“ The remediation of this site is a turning point for our town. In these times of very tight municipal budgets, the assistance of the Green Municipal Fund is very useful.”

—**Mayor Céline Tremblay, Municipality of Saint-Damien, Québec**

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