

# Stormwater management examples and resources

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## Alberta Municipal Examples

<p>City of Airdrie</p>	<p><b>Master Stormwater Drainage Plan</b></p> <p>The City of Airdrie developed a Master Stormwater Drainage Plan to help create a logical pattern of growth and development that is fiscally, environmentally, and socially responsible. The plan aims to:</p> <ul style="list-style-type: none"> <li>• Accommodate the projected growth of the municipality in a logical and orderly fashion</li> <li>• Prevent Flooding</li> <li>• Protect water quality in receiving streams and creeks</li> <li>• Work with natural topography</li> <li>• Respect land ownership patterns to the extent possible</li> <li>• Protect the riparian environment and unique characteristics of the local watershed.</li> </ul> <p><a href="#">Click here</a> for more information.</p>
<p>City of Calgary</p>	<p><b>Stormwater Management Strategy</b></p> <p>The City of Calgary has published a Stormwater Management Strategy to help protect their water into the future. The strategy provides an overarching direction, goals, and objectives for stormwater management efforts.</p> <p>As part of implementing the strategy Calgary has initiated many projects and initiatives to improve stormwater management, including:</p> <ul style="list-style-type: none"> <li>• A <a href="#">Stormwater Management and Design Manual</a> to guide the planning and development of stormwater facilities.</li> <li>• <a href="#">Rain gardens</a> that help manage the level of sediment loading into rivers.</li> <li>• <a href="#">Stormwater retrofit projects</a> that have helped reduce sediment, debris, and pollutants running into rivers.</li> <li>• <a href="#">Low Impact Development Resources</a> to help inform and assist developers and the public.</li> <li>• <a href="#">Bylaws</a> that regulate surface grades to control stormwater runoff.</li> </ul> <p>Click <a href="#">here</a> for more information on Calgary's approach to stormwater management.</p>
<p>City of Edmonton</p>	<p><b>Erosion and Sedimentation Control Guidelines</b></p> <p>The City of Edmonton has created a comprehensive guideline book with the objective of controlling erosion and sedimentation within the municipality. Both erosion and sedimentation are largely influenced by excessive runoff of stormwater. The guidebook contains a detailed overview of regulatory requirements, erosion and sedimentation science, drainage services, and a control plan for erosion and sedimentation.</p>

	<p><a href="#">Click here</a> to view the City of Edmonton's Erosion and Sedimentation Control Guidelines.</p> <p><b>Low Impact Development Best Management Practices Design Guide</b></p> <p>The Low Impact Development (LID) Design Guidelines provide guidance on the use of LID features to manage stormwater. This resource provides an overview of the benefits of LID and technical guidance related to its implementation.</p> <p><a href="#">Click here</a> to view the Design Guide.</p> <p><b>Stormwater Utility</b></p> <p>In January 2003, the City's stormwater was moved from property taxes to a new utility structure. Removing funding from property tax revenue is a significant development in Edmonton's Stormwater Drainage Servicing Strategy.</p> <p>Occupants are charged a fee based on a formula related to the area of land use zoning for their property. A typical homeowner will pay approximately \$6 per month. The charge appears on the utility bill.</p> <p>Click <a href="#">here</a> to learn more about the Utility.</p> <p>Click <a href="#">here</a> to learn more about Edmonton's overarching approach to stormwater management.</p>
City of Lethbridge	<p><b>Stormwater Management Design Standards</b></p> <p>The City of Lethbridge regulates the design of stormwater management facilities to require consideration of:</p> <ol style="list-style-type: none"> <li>1. Depth, speed and extent of overland flow and ponding</li> <li>2. Preventing access to the piped portion of the system</li> <li>3. Ability to escape from ditches and ponds</li> <li>4. Preventing the formation of slipping hazards</li> <li>5. Access for emergency vehicles</li> <li>6. Prevention of flooding and erosion damage</li> </ol> <p>The standards also outline level of service objectives, planning requirements, and set out provincial and federal regulations that must be adhered to.</p> <p><a href="#">Click here</a> to see the City of Lethbridge Stormwater Management Design Standards and <a href="#">here</a> for an overview of the City's stormwater webpage with information on their drainage bylaw and public outreach initiatives.</p>
City of Medicine Hat	<p><b>Storm Drainage Municipal Servicing Standards</b></p>

	<p>The City of Medicine Hat has created a document outlining standards for storm drainage in the municipality designed to fulfill Alberta Environment Guidelines in stormwater management.</p> <p><a href="#">Click here</a> to view the City of Medicine Hat's Storm Drainage Municipal Servicing Standards.</p>
<p>Strathcona County</p>	<p><b>Best Management Practices for Stormwater Management Facilities</b></p> <p>Strathcona County has created a best practices resource that helps guide the planning and development of stormwater management facilities. This document sets out the local context in water and stormwater management, applicable regulations, specifications, design guidelines and requirements, and best practices for the development of stormwater management facilities.</p> <p><a href="#">Click here</a> to see Strathcona County's Best Management Practices document and <a href="#">here</a> for more information on the County's stormwater management system.</p> <p><b>Sweep Not Spray</b></p> <p>The County is promoting an "I sweep, not spray" program to encourage residents to sweep their driveways and sidewalks instead of washing them. Washing driveways and sidewalks wastes valuable drinking water and the runoff can impact water quality in our stormwater ponds.</p> <p>This initiative is part of the <a href="#">Yellow Fish Road</a> program which paints yellow fish symbols on stormwater drains to spur people to think more about how human actions can impact our rivers, lakes and streams.</p> <p>Click <a href="#">here</a> for more information on "I sweep, not spray."</p>
<p>Town of Okotoks</p>	<p><b>Stormwater Management Master Plan &amp; Flood Mitigation Plan</b></p> <p>In 2014 the Town adopted a Stormwater Management Master Plan and Flood Mitigation Plan to define the existing stormwater drainage system capacity along with the required upgrades, and to define the future drainage planning goals of the undeveloped areas within the Town of Okotoks. The plan is complemented by a Storm Drainage Bylaw, Lot Grading Bylaw, and Community Standards Bylaws.</p> <p>Click <a href="#">here</a> for more information on the Town of Canmore's stormwater management system</p>
<p>Town of Pincher Creek</p>	<p><b>Master Drainage Plan for Northeast Pincher Creek</b></p> <p>The Town of Pincher Creek has created a plan to assist in stormwater management and the control of drainage in the municipality. Pincher Creek has undergone a rapid pace of development in recent decades, presenting unique and pressing stormwater management issues. This plan analyzes those issues and presents recommendations for stormwater management.</p>

	<a href="#">Click here</a> to view the Town of Pincher Creek’s Master Drainage Plan.
<b>YOUR MUNICIPALITY HERE</b>	<b>DOES YOUR MUNICIPALITY HAVE AN APPROACH TO STORMWATER MANAGEMENT THAT COULD SERVE AS A MODEL FOR OTHERS TO FOLLOW? IF SO, SEND THE INFORMATION TO WATER.AUMA.CA</b>

**National and international examples, and additional resources**

AUMA	<p><b>Webinars</b></p> <p>On March 24, 2014, AUMA hosted <i>Rainwater as a Resource</i>, a webinar on stormwater reuse. It featured a presentation from Municipal Affairs on the policy context for stormwater reuse in Alberta and an overview of the City of Abbotsford’s stormwater harvesting successes.</p> <p>Additionally, the Municipal Stormwater Solutions webinar provided an overview of AUMA’s proposed policies, as well as a presentation from Strathcona County on tools and initiatives for managing stormwater more sustainably.</p> <p><a href="#">Click here</a> to view <i>Rainwater as a Resource</i>.</p> <p><a href="#">Click here</a> to view <i>Municipal Stormwater Solutions</i>.</p> <p><b>Water Recovery, Reclamation, Reuse and Recycle Programs (RRRR)</b></p> <p>Water RRRR programs can help municipalities harness wastewater to help reduce overall usage. These programs also have the added benefit of reducing stormwater runoff, as water that would otherwise become runoff is used.</p> <p>Click <a href="#">here</a> to see more information and examples on our <a href="#">Water Conservation</a> page.</p>
Canada Mortgage and Housing Corporation	<p><b>EQuilibrium Communities Initiative</b></p> <p>The EQuilibrium Communities Initiative is a sustainable community demonstration initiative that was jointly funded by Canada Mortgage and Housing Corporation (CMHC) and Natural Resources Canada. It provided financial assistance to developers for research and technical activities to improve, monitor, and showcase their performance in the areas of water and stormwater, energy, protection of the natural environment, land use and housing, transportation and financial viability.</p> <p><a href="#">Click here</a> for more information on the EQuilibrium Communities Initiative.</p>



	<p><b>Green Roof Resources</b> Green roofs are vegetated roof covers which can improve stormwater management, increase green space, and reduce a building's contribution to the heat island effect. The CMHC has created various resources on green roofs that can help municipalities encourage them in their community.</p> <p><a href="#">Click here</a> to view the CMHC Green Roof Resource Manual for Municipal Policy Makers</p>
Depave Paradise	<p><b>Transforming Asphalt into Green Space</b> Depave Paradise is a project of Green Communities Canada and our local partners in communities across Canada where volunteers and neighbourhoods have been (or will soon be!) removing unwanted pavement and planting gardens filled with native species in its place.</p> <p>Click <a href="#">here</a> to learn how to depave your community</p>
Environment Commissioner of Ontario	<p><b>Stormwater Charges</b> The Environmental Commissioner of Ontario (ECO) released a report on stormwater charges and asset management planning, to support decision-making and funding of municipal stormwater infrastructure. The report outlines some current challenges in stormwater management, examines a key response to address these challenges: stormwater fees, and highlights success stories from within Ontario and elsewhere of implementing stormwater fees.</p> <p>Click <a href="#">here</a> to read the report.</p>
Federation of Canadian Municipalities	<p><b>Stormwater Management Planning Best Practices</b> The Federation of Canadian Municipalities (FCM) has created a stormwater management planning best practice guide to assist municipalities with stormwater management in light of the fiscal pressures they often face. The guide includes basic guiding principles, planning issues and frameworks, and additional information related to stormwater management.</p> <p><a href="#">Click here</a> to view the FCM Stormwater Management Planning Best Practices document.</p> <p><b>Green Municipal Fund</b> The Federation of Canadian Municipalities' Green Municipal Fund offers funding for stormwater management facility projects. Eligible projects must demonstrate the potential to eliminate all site runoff for the 90<sup>th</sup> percentile of all 24-hour rainfall events, by volume. Examples of eligible projects include rainwater collection and reuse, green roofs, rain gardens, and infiltration initiatives.</p> <p><a href="#">Click here</a> for more information about the Green Municipal Fund.</p>

<p>Government of Alberta – Environment and Parks</p>	<p><b>Municipal Wastewater and Storm Water Management Program</b>          Alberta Environment and Parks (AEP) regulates Municipal Wastewater and Stormwater Programs in Alberta to ensure environmental protection. The AEP website includes guides to regulatory requirements for domestic wastewater and environmentally acceptable wastewater and stormwater discharges, as well as information on various initiatives and other resources for municipalities.</p> <p><a href="#">Click here</a> to view the AEP wastewater and stormwater site.</p> <p><b>Watershed Resiliency and Restoration Program (WRRP)</b>          The WRRP goals are to enhance the ability of watersheds to mitigate the effects of flooding and drought, restore degraded watershed areas to strengthen communities' ability to withstand future flooding or droughts, and to promote ongoing stewardship and preservation of watersheds. Eligible projects must promote the long-term ability of watersheds to mitigate effects of flood and drought events, such as riparian and/or wetland enhancements, floodplain/river improvements, conservation initiatives, and watershed resiliency education and outreach.</p> <p>Click <a href="#">here</a> for more information.</p> <p><b>Alberta Community Resilience Program (ACRP)</b>          The ACRP is a province-wide, cost-shared capital funding program that focuses on long-term community resilience. The program supports projects that develop community resilience, focusing on mitigation efforts from floods and droughts, while improving and supporting watershed health. Eligible initiatives include the design and construction of projects that protect critical municipal infrastructure from floods and droughts, improve the health of watersheds, and help ensure public safety.</p> <p>Click <a href="#">here</a> for more information.</p>
<p>ISWM.ca</p>	<p><b>Innovative Stormwater Management Practice</b>  <a href="#">ISWM.ca</a> is an online database of innovative and low impact development stormwater management practices in Ontario that was developed by the Toronto Region Conservation Authority. It is a free, publicly accessible archive for municipalities, developers, consultants and others to share information regarding these practices.</p>
<p>Metcalf Foundation</p>	<p><b>Incenting the Nature of Cities</b>  <i>The Incenting the Nature of Cities: Using Financial Approaches to Support Green Infrastructure in Ontario</i> report, funded by the Metcalf foundation as part of their <a href="#">Green Prosperity Series</a>, builds the business case for cities to invest in green infrastructure. The paper introduces six market-based tools that have been used effectively across Canada and the United States to support the expansion of green infrastructure.</p>

	Click <a href="#">here</a> to view the report.
POLIS Project	<p><b>Peeling Back the Pavement: A Blueprint for Reinventing Rainwater Management in Canada’s Communities</b></p> <p>The POLIS Project on Ecological Governance has created a handbook outlining the problems with conventional stormwater management and examining the solutions for moving forward sustainably. It provides a comprehensive blueprint for the steps necessary to change the way communities manage and govern stormwater. The handbook was developed in partnership with the Environmental Law Centre at the University of Alberta.</p> <p><a href="#">Click here</a> to view the Peeling Back the Pavement handbook.</p>
RAIN Community Solutions	<p><b>Supporting Green Infrastructure</b></p> <p>RAIN Community Solutions builds support for and participation in stormwater innovations that reduce runoff by managing rain where it falls.</p> <p>Strategies include workshops, demonstration projects, depaving events, presentations, outreach, tours, workbees, neighbourhood meetings, contractor training, and home and commercial visits.</p> <p>Click <a href="#">here</a> to learn about the services RAIN can provide your community.</p>
Rooftops to Rivers	<p><b>Green Strategies for Controlling Stormwater and Combined Sewer Overflows</b></p> <p>The National Resource Defence Council’s Rooftops to Rivers provides case studies for 14 geographically diverse cities that are all leaders in employing green infrastructure solutions to address stormwater challenges -- simultaneously finding beneficial uses for stormwater, reducing pollution, saving money, and beautifying cityscapes.</p> <p>Click <a href="#">here</a> to access the resource and <a href="#">here</a> to view more on water-smart cities.</p>
United States Environmental Protection Agency	<p><b>Stormwater Management Resource</b></p> <p>The United States Environmental Protection Agency (EPA) has developed an informational site that provides information about stormwater and stormwater management. This site can be a useful background to the practice of stormwater management.</p> <p><a href="#">Click here</a> to view the EPA Stormwater Management Site.</p>