

Stormwater Management

Led by: Director of Water Services

Service Description

Stormwater Management is a highly regulated, essential and public health focused service that protects property from flooding and ensures our watersheds are healthy by working with citizens and partners. Our service manages water from rain or snow/ice melt by collecting, storing, or moving it into the nearest river or creek through storm drains, pipes, ponds and outfalls. To prepare Calgarians for emergency response to flooding, we work with the community and other levels of government. We monitor river water quality and quantity, assess riverbank health, and we are involved in land use and development issues to reduce water quality impacts and flood risk in Calgary and the region.

Service Updates

Key Service Results

Citizens value stormwater management which prepares our city for climate change and protects public safety and infrastructure. The Stormwater Strategy, which was approved by Council in 2023, sets out a long-term direction for new and innovative ways to manage stormwater runoff, improve water quality and decrease pressure on the stormwater system.

In 2023, we completed a community-wide drainage project in Tuxedo Park; constructing a dry pond and installing larger storm water infrastructure to support better stormwater management, which will create opportunity for higher densification in Tuxedo and surrounding communities. A new storm pipe was also finished, moving stormwater from communities above Sunnyside to the river, bypassing Sunnyside. These projects, along with numerous local and community improvements, enhance the safety of residents and protect vulnerable areas from damage caused by stormwater flooding.

This year also marked the 10-year anniversary of Calgary's 2013 flood. Since then, we've undertaken 35 major infrastructure projects to protect the city from river flooding, including the recently completed Downtown Flood Barrier, protecting our downtown core.

Service Challenges

In 2023, Calgary saw an increase in roadway pooling complaints due to rapid melt of snow and ice. We are working with Mobility and citizens to build understanding of the stormwater system and ensure storm drains are functioning as designed. As the city grows, it is challenging to respond to customer requests with over 60 000 catch basins.

The stormwater service is complex due to evolving regulatory conditions, different service levels and physical site conditions. Finding stormwater solutions that are affordable, practical, and that ensure river health, is a challenging component to delivering this service line with Calgary's current pace of growth and climate change impacts.

Trends & Potential Uncertainties

Climate change will continue to create uncertainty and poses risk to stormwater management. Further, while water re-use continues to be at the forefront of planning discussions, there needs to be more research and guidance from the province regarding water re-use parameters. With the current drought outlook for 2024, water re-use will continue to be a trending topic.

As Calgary continues to grow, growth servicing for stormwater will likely need to include collaborative solutions with our regional partners. Further, the environmental performance targets we are aiming for are challenged with the current pace of growth which will also require ongoing collaboration.



Measuring Our Performance

Legend

— Actuals

■ Expected Future Performance

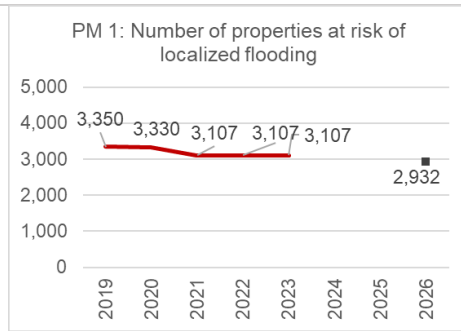
➡ Progressing as planned

⊖ Not progressing as planned

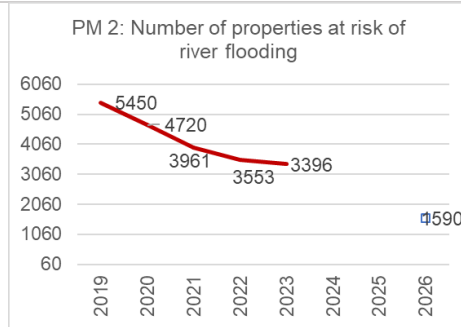
Performance Measures

Story behind the numbers

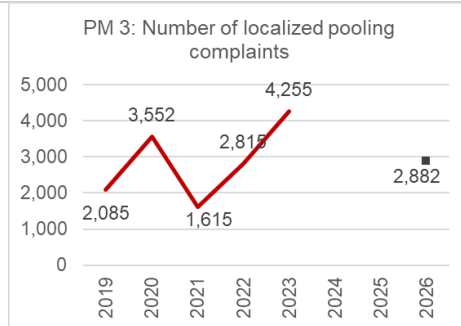
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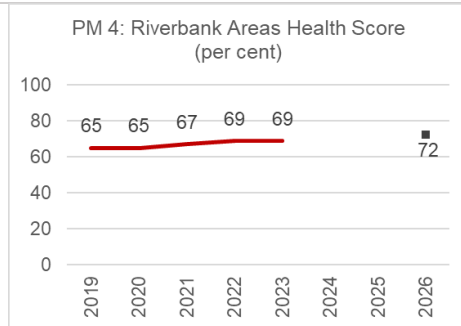
Calgarians trust the Stormwater service to protect public safety and reduce damage to property. To protect vulnerable areas from flooding damages during intense storms, key investments include drainage improvement programs and a citywide stormwater modelling initiative. Work is underway by The City to develop advanced analytical tools to help inform decisions on equitable investments in stormwater infrastructure with a focus on flood resiliency.



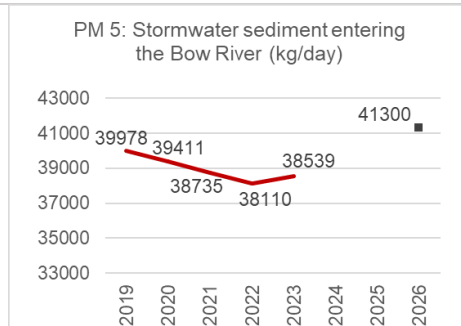
Key strategies to reduce river flooding risks center on capital investments in upstream dams, flood barriers and protected stormwater outfalls. Since 2013, Calgary's flood risk reduced by 55 per cent. In 2023, work advanced on two major structures anticipated to provide significant additional flood protection: the Government of Alberta's Springbank Off-stream Reservoir, and the Sunnyside Flood Barrier. Additionally, efforts in 2023 focused on advancing work with the Government of Alberta on a potential new Bow River Reservoir, new flood hazard maps, new regulatory framework for flood resilient development, and property-level flood readiness.



Stormwater pooling complaints are seasonal and variable each year, dependent on snowpack, temperature fluctuations and intensity of rainfall events. In 2023, we saw an increase in pooling complaints where almost 50% of the complaints occurred in March. With over 60,000 catch basins in Calgary, engagement with the public is imperative to build an understanding of expectations during thawing events and how the public can help with local drainage issues. We are beginning to work with Mobility and will enhance strategic communications to citizens.



River banks (riparian areas), are integral to maintaining healthy rivers and play a role in slowing flood waters. The City's Riparian Action Program establishes actions to protect and manage river banks and sets an expected future performance average of 72% city-wide. The current score is 68.9% (101 assessed sites) compared to the 2007-2010 baseline of 61% (58 assessed sites). The current score represents a site that is healthy but with moderate impacts due to human or natural causes. This improvement is the result of ongoing City investment in restoration work, improved management of some sites and natural recovery after the 2013 flood.



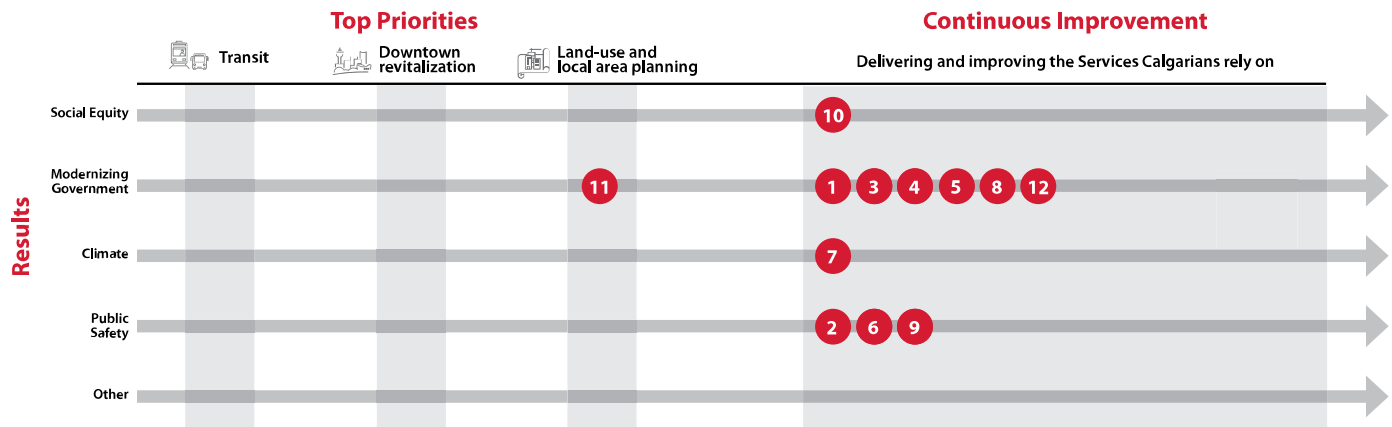
Calgarians value a healthy environment and rivers. Sediment entering the Bow River remains below the 2005 benchmark of 41,300 kg. New wet ponds in new construction and redevelopment areas contribute to this measure. The City is currently updating the city-wide stormwater loading model, which measures our impact on the river. These updates reflect recent land use changes and include additional infrastructure that protect the river. This will improve estimated stormwater loadings to the river. Maintaining critical stormwater infrastructure along with spill mitigation initiatives, help keep this measure below the expected future performance.





Progress on Service Delivery

Alignment with Council Refined Priorities and Result Areas



- Legend**
- Completed
 - Progressing as planned
 - Not progressing as planned
 - Not started
 - Initiative number

Initiative	Initiative Update	Status
1 Reduce risk of localized flooding by continuing to invest in community and local drainage improvements, evolving the community drainage program to achieve desired levels of service, and quantifying the investments needed to address gaps and physical limitations of stormwater infrastructure in established communities.	<p>Work continues developing a modelling tool to estimate net flood damages in different areas of the city, over multiple events. This will support consistent evaluation of capital projects, support planning and design standards for redevelopment to make the most efficient investments to improve service levels.</p> <p>The Utility invests in multiple local drainage improvements (LDI) and community drainage improvements (CDI) to better manage stormwater in localized areas or larger catchments. The Upper Plateau Separation project and Tuxedo Park CDI are two community-wide projects worked on in 2023.</p>	
2 Create safe and resilient communities through the continued delivery of strategic initiatives and capital flood mitigation projects to reduce the risk of river flooding.	The operational timeline for the Government of Alberta (GoA) Springbank Offstream Reservoir has been delayed until 2025. Accordingly, 2024 flood response plans will revert to those from 2023. An operations committee has been struck between the GoA and The City to jointly manage Glenmore and Springbank Reservoirs for flood operations, routine maintenance, water quality, dam safety, and drought, among other purposes.	
3 Build resilient communities by guiding redevelopment in established areas to mitigate flood risks and working with developers on innovative stormwater management solutions that enhance public spaces.	New tools and incentives are being explored to support more redevelopment in established areas, and in particular more housing, while also mitigating flood risks. Implementation of new tools and incentives is expected in 2024.	
4 Maintain service resilience by ensuring appropriate resources to respond to more frequent and extreme events and operate the growing Stormwater Management network (334 ponds and wetlands, 33 lift stations, 934 outfalls and over 5,000kms of underground pipes).	A new solely dedicated team will work closely with Stormwater Operations to advance best practices and deliver on the Stormwater Strategy.	

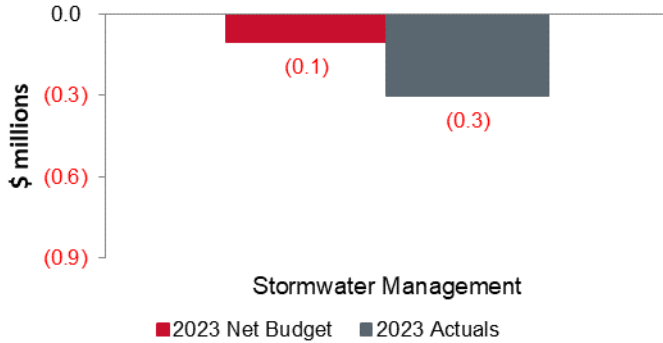
Initiative	Initiative Update	Status
<p>5 Build understanding of customer interactions and expectations of the Stormwater line of service. Develop programs that build customer awareness and shared responsibility for managing water quality and quantity on private property.</p>	<p>In 2023, Water Services rolled out a rigorous customer research program which has increased understanding of customer needs and experience. Insights gathered are being used to deliver service and drive future conversations on service delivery.</p> <p>The stormwater service continues to make communities more resilient by improving the levels of service through community drainage initiatives. There is also work underway to build better tools for evaluating green stormwater infrastructure including better support for developers to implement requirements for managing stormwater in new developments.</p>	
<p>6 Reduce the risk of safety incidents on stormwater infrastructure through the development of a storm pond safety program. Build understanding of investments needed for communicating, partnering, designing, and upgrading stormponds to meet program goals for safety.</p>	<p>The storm pond winter safety campaign continues to raise awareness among citizens about the risks of recreating on or near storm ponds. While a number of communication tactics are used in the public campaigns, new signage standards were established in 2023 that better explain visually how storm ponds work to improve safety.</p>	
<p>7 Adapt to our future climate by delivering and enabling investments and advancing initiatives that reduce flood risks and pollutants entering the river, and ensure operational staff and systems are prepared to respond to more frequent and extreme rain and flood events.</p>	<p>With approval by Council in September 2023, the City's Stormwater Management Strategy and its implementation program will ensure our shifting climate is incorporated into the four cornerstone areas identified within the Strategy</p>	
<p>8 Meet future needs and advance the Stormwater Strategy to guide prioritization and resourcing for key initiatives on low impact development, watershed targets, customer and developer engagement, and partnership in development of public spaces.</p>	<p>The Stormwater Strategy approved by Council in Fall 2023 focusses on performance metrics including sub-basin watershed health targets. A workplan to advance refinement of watershed targets was developed through Q4 of 2023.</p>	
<p>9 Protect the health of the river and maintain our environmental performance by continuing to meet regulatory requirements on total loadings to the river and mitigating the risk of spills into the stormwater system.</p>	<p>A city-wide stormwater management water quality loading model, used to project performance with growth and climate change, is being updated and improved upon. Notably, we are continuing to track below regulatory limits for TSS (total suspended solids) loadings and nutrients to the river.</p> <p>An Emergency Response Plan (ERP) that will address spills is being created and aims to be complete this business cycle.</p>	
<p>10 Establish levels of service, optimize value, and deliver service equity by leveraging innovation, data, technology, and customer insights.</p>	<p>Water Services rolled out a rigorous customer research program has increased understanding of customer needs and experience. Insights gathered are being used to deliver service and drive future conversations around our service delivery.</p> <p>Work is also underway to strategically assess levels of service to ensure that a consistent and reliable approach to service delivery is provided to our customers.</p>	
<p>11 Optimize investment decision-making and proactive service delivery through the development of Stormwater Asset Management plans and preventative maintenance plans to align capital investments, maintenance contributions and operational resources.</p>	<p>Draft Strategic Asset Management Plan (SAMP) completed and being reviewed by collaborators. Next steps include the development of a detailed workplan.</p>	

Initiative	Initiative Update	Status
12 Build shared priorities, develop objectives and improve activity planning by building partnerships across internal city business units.	Several years of research and engagement culminated in the Stormwater Strategy being approved by Council in September 2023. The Strategy sets out a long-term direction for new and innovate ways to manage stormwater runoff, improve water quality and decrease pressure on the stormwater system.	



Service Updates on Financial Performance

Net Operating Budget and Actuals as of December 31, 2023



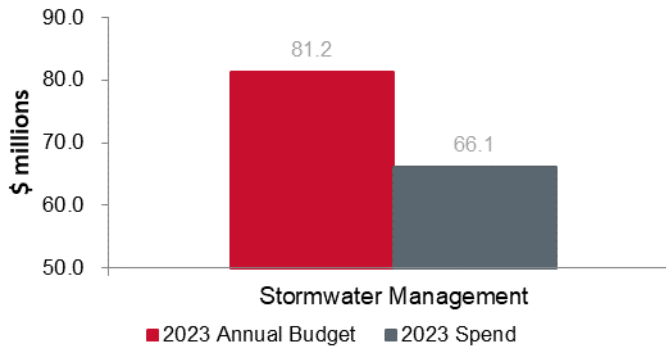
Operating Budget Updates - 2023 net operating budget vs actuals:

The Stormwater service line is self-supported and has a favourable operating variance of \$0.2 million. Variances occur due to the process for reporting self-supported expenditure in different areas that contribute to delivering service.

The operating surplus transferred to reserve was \$44.8 million which is higher than the budgeted transfer to reserve of \$23.1 million. This primarily resulted from higher than budgeted revenue due to an increase in development agreements resulting in higher Off-Site levy revenues. Stormwater had lower than budgeted salary and wage expenditure resulting from higher vacancies related to stormwater work offset partially by higher sickness & accident claims and overtime. There were also lower expenses in materials, chemicals, parts, contracted services, and overall utilities.

The budgeted transfer to reserve is planned to fund capital expenditure including replacements, upgrades and investments that occur year after year. Large capital investments are planned to be financed with debt. When the actual transfer to reserve is higher than planned, the borrowing for large capital investments will be lower than anticipated.

Capital Budget and Spend as of December 31, 2023



Capital Budget Updates - 2023 total capital budget vs 2023 spend:

The 2023 capital budget is \$81.2 million with a year end spend of \$66.1 million (81.4 per cent spent). Capital investments focus on improving watershed health and mitigating flood risks. Supply chain issues affecting the availability of material and resources continue to have impacts on project delivery, in addition to cost and inflationary increases. Examples of major investments include:

- Community Drainage Improvement (\$28.8 million invested in 2023). Investments continue in northwest inner-city communities including the Upper Plateau Separation project. Improvements involve engineering design and construction to enhance the stormwater service potential and capacity to reduce the risk of flooding and improve resiliency against the impact of climate change.

- 144 Ave North Storm Trunk (\$15.7 million invested in 2023). This storm trunk will support growth in communities by servicing the east basin of the Keystone Area Structure Plan to drain to Nose Creek.