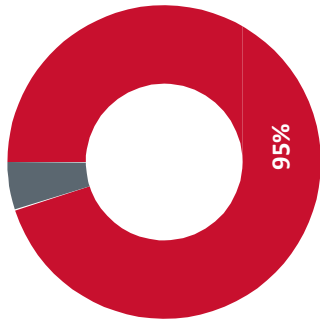




2016 Watershed Planning Activity and Results Summary

Goal 1: PROTECT OUR WATER SUPPLY

What We Did: 2016 Highlights	
Background: Story Behind the Baseline Goal: Reduce risks to Calgary's water supply and ensuring reliable, secure, high quality water supply for Calgary's customers. Risks: As Calgary and the region grow, demand for our drinking water increases, which results in greater pressures on the water supply. The region is prone to drought and future water supply is further restricted because of climate change impacts and the provincial closure of the South Saskatchewan River Basin to new water licences.	- Completed a watershed assessment and risk study of Calgary's source watersheds which identified potential contamination from wildfires and stormwater from land development as the two primary risks to Calgary's water supply. - Improved drought preparedness by updating the Drought Operational Response Guidelines. - Initiated an Integrated Water Supply Management Strategy to support financial and operational decision making. - Initiated a climate resiliency program to address climate impacts on the watershed and improve the Utility's water resource, energy and carbon management. This work is aligned with the renewed Corporate Climate Program (UCS2017-0054).
2017 Planned Actions	
- Advance water resource plans: Develop a strategic framework for an Integrated Water Supply Management Strategy. Development of the Source Water Protection Plan, including targeted stakeholder engagement. Complete a risk assessment, update drought triggers, and undertake stakeholder engagement for the Drought Management Plan. - As part of the climate resiliency program, complete a climate adaptation plan and energy and carbon management plan for the Water Utility. - Continue to mitigate risk to drinking water quality: review risks for Drinking Water Safety Plan and continue implementing the Emerging Substances of Concern (ESOCs) strategic plan. - Prepare for the establishment of a new Calgary regional Growth Management Board, which over several years will develop a regional servicing plan, including delivery of water and wastewater.	Citizens who are satisfied with the quality of drinking water  95% no change from 2015
Strategic Alignment	
H3: Manage the interrelationships between flood protection, water quality and quantity, and land use.	H4: Work with our regional partners & the GOA on an integrated approach to the watershed. H6: Continue to build public awareness & understanding of our shared responsibility to conserve & protect the environment.



2016 Watershed Planning Activity and Results Summary

Goal 2: USE WATER WISELY

Background: Story Behind the Baseline

Goal: The Water Efficiency Plan (WEP) calls for the same amount of water to be withdrawn from the river in 2033 as was taken out in 2003.

Risks: Population growth in the Calgary region increases water demands on the rivers and Calgary's treatment plants. Establishment of the Regional Growth Management Board will require The City to adapt regional service delivery, strategies and infrastructure in the future.

What We Did: 2016 Highlights

- Reviewed the WEP in 2016, resulting in a shift towards market-based programming targeting the irrigation and landscape sectors.
- Annual water withdrawn from the rivers was 18 per cent less than the 2003 benchmark, despite a population growth of 30 per cent since 2003.
- Overall water use is on track to meet the 2033 target, with total per capita water demand decreasing by 30 per cent since 2003. Residential water demand was 214 litres per capita per day (lpcd) in 2016.
- Calgary's highest total water use in a single day occurred June 6 and remained below the current capacity of Calgary's water treatment plants.
- Continued to identify and fix watermain leaks, saving ~10 million litres per day in 2016.

2017 Planned Actions

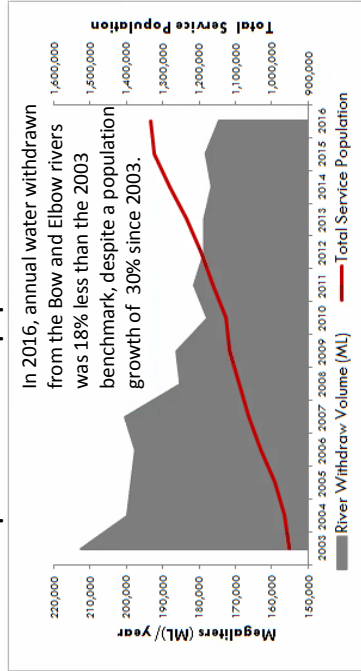
- Build new water efficiency programs focussed on targeted industrial, commercial, and institutional (ICI) customers.
- Conduct research and strengthen relationships with targeted ICI sector to: understand water use profiles, build networks, and inform program development.
- Align water efficiency programming, demand forecasting and infrastructure planning.
- Continue to provide outreach and education to citizens about water conservation.

Strategic Alignment

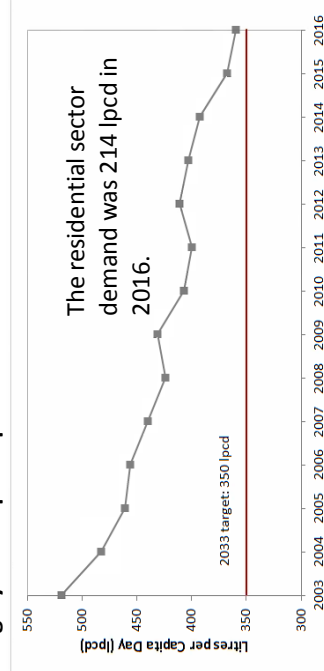
H3: Manage the interrelationships between flood protection, water quality & quantity, and land use.

H6: Continue to build public awareness and understanding of our shared responsibility to conserve and protect the environment.

Annual water withdrawal (ML/year) from the Bow and Elbow rivers as compared to service population



Calgary's total per capita water demand over time

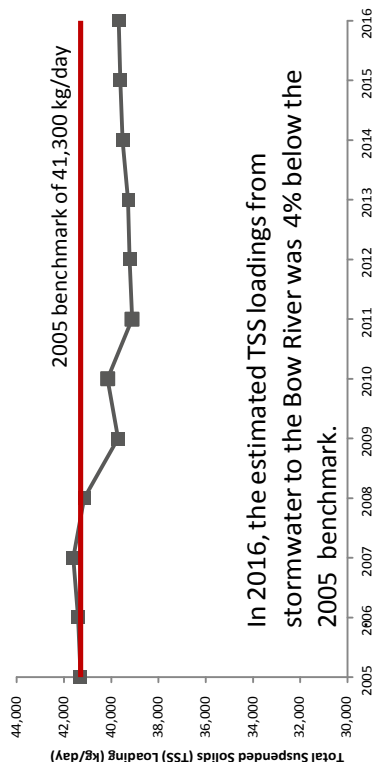


Peak day demand – maximum volume of water used in Calgary in one day



2016 Watershed Planning Activity and Results Summary

Goal 3: KEEP OUR RIVERS HEALTHY

What We Did: 2016 Highlights	
Background: Story Behind the Baseline Goal: Water quality protection is guided by The City's Wastewater Approval to Operate from the Province. The Stormwater Management Strategy aims to reduce the rates and volumes of stormwater runoff and keep total suspended solids entering the river below 2005 levels. Risks: Pollutant loadings into the waterways can create significant impacts on water quality and river health. High pollutant loadings can cause maintenance issues and infrastructure upgrade requirements for wastewater and stormwater infrastructure.	Continued capital upgrades to the Bonnybrook Wastewater Treatment Plant, initiated the Win-Win program to address high-strength wastewater challenges, and formalized the fats, oils, and grease (FOG) program to reduce impacts on the wastewater system. - Kept sediment loadings from stormwater below provincial objectives and City benchmark, and updated the Bow River Water Quality Model used to monitor pollutant loadings to the Bow River. - Completed internal engagement to inform the development of a strategy for Green Stormwater Infrastructure (GSI), formerly LID. - Continued to advance the Riparian Action Program by restoring four riparian areas in addition to mapping, monitoring, and education and outreach. - Reviewed and started expanding the metrics used to evaluate watershed health to include metrics on habitat, landscape, water quality, hydrology and biodiversity.
2017 Planned Actions	
- Implement viable options to maintain compliance for wastewater treatment: Continue plant upgrades, and advance the Win-Win Wastewater project and FOG program. Complete the receiving water assessment (RWA). - Make progress on updating The City's stormwater management strategy and performance targets to ensure protection of the health of the river: advance the Total Loading Management program and study new loadings targets. - Make progress on a GSI Strategy: create a work plan to support the implementation of GSI and engage with the development industry on future opportunities. - Contribute to the update of the Nose Creek Watershed Management Plan. - Advance the Riparian Action Program: engagement, riparian area restoration, integrate riparian maps in land use planning processes, and pilot education and outreach programs. - Expand the metrics used to evaluate watershed health.	Total Suspended Solids (TSS) to the Bow River from stormwater  In 2016, the estimated TSS loadings from stormwater to the Bow River was 4% below the 2005 benchmark.
Strategic Alignment	
H3: Manage the inter-relationships between flood protection, water quality and quantity, and land use.	H4: Work with our regional partners & the GOA on an integrated approach to the watershed.
H6: Continue to build public awareness & understanding of our shared responsibility to conserve & protect the environment.	H10: Lead by example & manage regulatory risks to protect public health & the environment.



2016 Watershed Planning Activity and Results Summary

Goal 4: BUILD RESILIENCY TO FLOODING

Background: Story Behind the Baseline

Goal: Implement the 27 recommendations from the Expert Management Panel on River Flood Mitigation (PFC 2014-0512).

Risks: Another major flood in Calgary is likely to occur, and would cause significant disruption to critical systems and services, Calgarians, businesses, and cause damage to public and private property. Another flood also poses business continuity, environmental, and health and safety risks to The City's Corporate operations.

What We Did: 2016 Highlights

- Evaluated the social, economic, and environmental impacts of flood mitigation options through the Flood Mitigation Measures Assessment. The Assessment examined watershed, community and property level options for both the Bow and Elbow rivers to reduce Calgary's flood risk. It included a sustainability analysis of mitigation measures using triple bottom line criteria and comprehensive public engagement.
- Applied for \$19.5 million for flood mitigation through the Alberta Community Resiliency Program.
- As of 2016, 11 of the Flood Expert Panel recommendations are complete and 16 are in progress.
- Mitigation work that is already complete or is ongoing has reduced Calgary's financial exposure to flood damage by about 30 per cent.

2017 Planned Actions

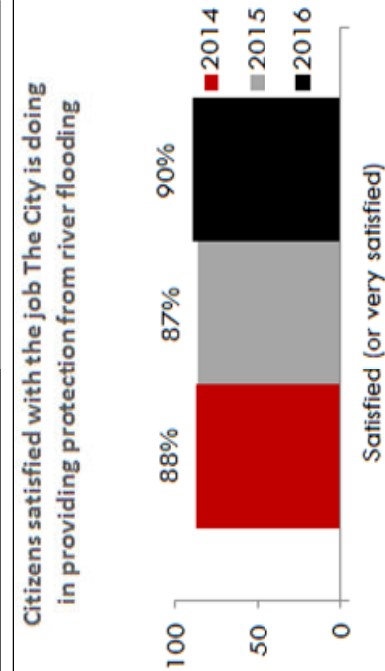
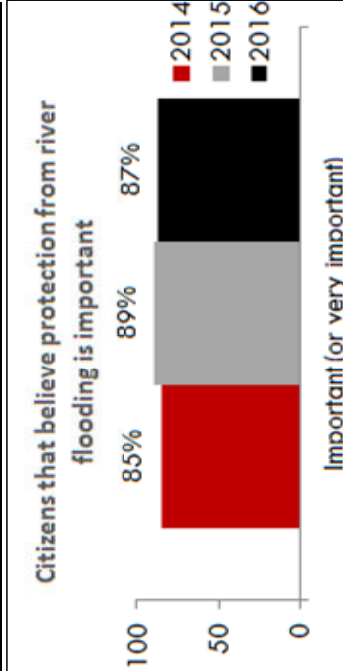
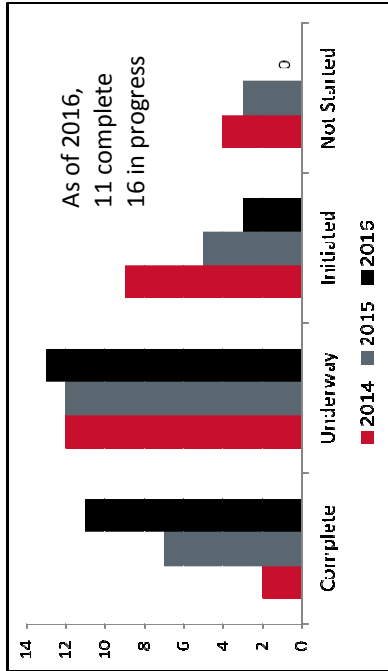
- Deliver Flood Measures Assessment Report SPC on Utilities and Corporate Services. (UCS2017-0266).
- Continue to build resiliency to flooding including advancing Expert Panel recommendations.
- Develop an implementation and funding plan for community level flood mitigation.
- Continue to advocate and provide technical support for upstream mitigation for the Bow and Elbow rivers.
- Explore the development of a property level mitigation program.

Strategic Alignment

H3: Manage the interrelationships between flood protection, water quality & quantity, and land use.

N2 - Build resiliency to flooding.

Progress on the 27 Expert Panel recommendations





2016 Watershed Planning Activity and Results Summary

Goal 4: BUILD RESILIENCY TO FLOODING

COMMUNITY DRAINAGE IMPROVEMENT (CDI) PROGRAM

Background: Story Behind the Baseline	What We Did: 2016 Highlights
Goal: The City is investing in stormwater infrastructure upgrades to bring established communities that are experiencing local flooding to modern standards and levels of service. The goal is to reduce the economic, social and environmental impacts of local flooding on the affected citizens and communities. Risks: The costs of local flooding will continue until infrastructure upgrades are installed. These costs are also a barrier to redevelopment and densification efforts in the affected communities.	- The City is advancing strategies to accelerate the delivery of the Community Drainage Improvement Program, including the use of innovative, cost-effective designs, pursuing external funding, and developing alternative procurement strategies. In 2016 The City: - Improved processes to address impacts from increasing frequency of extreme weather events, such as the rainfall events of summer 2016 which caused stormwater flooding. - Advanced the design of two storm ponds and storm sewer upgrades in Woodlands, Woodbine, Cedarbrae and Braeside. Construction of this infrastructure package, estimated at \$49 million, will commence in 2017 with completion planned for 2019. - Completed stormwater improvement projects in Haysboro at a cost of \$484,000, resulting in over \$20 million in social, economic, and environmental benefits.

2017 Planned Actions

- The 2015-2018 Action Plan identified the need to explore opportunities to accelerate the delivery of stormwater infrastructure upgrades. Three strategies are being advanced: - Design innovations to yield more cost effective upgrades. The Christy Park project is based on a design that is \$9.5 million dollars less than the original conceptual design. The City will continue to pursue innovative designs and value-engineering to drive cost-efficiencies. - External Funding, including Federal and Provincial funding opportunities. The New Building Canada Fund is contributing \$2.1 million toward the construction of Pump Station #1 in Sunnyside. Other opportunities for funding CDI projects are linked to the potential to access river flood mitigation funding. - Strategic long term partnerships with engineering consultants and contractors to increase cost savings. In 2017, The City will assemble a procurement package for the design and engineering management of a number of infrastructure upgrades. The appetite in the market for this approach will be tested in 2018. - Explore options to increase investments in the CDI program funded by the Drainage Service charge, and report back to Council as part of the 2019-2022 business planning and budget process.

Strategic Alignment

N2: Build resiliency to flooding.	N5: Systematically invest in established neighbourhoods as they evolve to accommodate changing community needs.	H3.2 Continue to strengthen the strategy and actions for the Drainage line of service to improve its overall performance and condition.
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