



Statement of Community Priorities

Alberta Community Resilience Program

Introduction

As part of the Alberta Community Resilience Program (ACRP), applicants are being asked to submit a Statement of Community Priorities prior to (or with) their first application to the program.

The purpose of this statement is to provide the Grant Review Committee with context on the overall mitigation issues facing a community, specific issues of chronic flood/erosion/drought, overall community mitigation goals and priorities, and the projects being planned to achieve those goals and priorities. The statement should be historical in nature and identify a community's highest priority projects in the next 2 to 3 years. With this information, the Grant Review Committee can make recommendations for funding that hopefully represent the cumulative priorities of Alberta's communities.

Preparation of these statements need not be complex or lengthy, as long as they provide a clear indication of community priorities which are not likely to change.

Section 1 Community Overview

Name of Community: City of Calgary

Population: 1,195,194 (2014)

Community location:

City of Calgary is located in south central Alberta, at the intersection of the TransCanada Highway and the Queen Elizabeth II Highway and at the confluence of the Bow and Elbow Rivers

Rivers, streams, or creeks that intersect in your community:

The primary water courses that intersect our community are: Bow River, Elbow River, Fish Creek, Nose Creek, West Nose Creek and Pine Creek. Many smaller creeks are also present, including Forest Lawn Creek, Confederation Creek, Radio Tower Creek, Beddington Creek, and numerous unnamed drainages.

There are two dams that play a key role in water supply management for The City - Bearspaw Dam on the Bow River, operated by TransAlta Utilities, and Glenmore Dam on the Elbow River, owned and operated by The City of Calgary primarily for domestic water supply. A secondary function of the Glenmore Dam is to provide some flood attenuation during high river events, and several TransAlta Dams on the Bow River can also be operated for flood mitigation upstream of Calgary.

Major industries near identified water bodies (please name industrial facilities, if possible):

The major industries near the primary water bodies are gravel extraction and associated cement plants operated by Lafarge and Burnco and the hydroelectric facility at Bearspaw Dam.

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Major public infrastructure near identified water bodies (hospitals, roads, etc.):

Major public infrastructure near water bodies includes:

Major routes for access/egress that cross and/or run alongside rivers include, but are not limited to, Deerfoot Trail, Macleod Trail, Memorial Drive, Glenmore Trail, and Heritage Drive. The LRT system is also a key part of The City's transportation system and crosses both the Bow and Elbow Rivers.

Bow River Bridges: 17 vehicle bridges including Centre Street and 12th St SE, plus 12 pedestrian bridges.

Elbow River Bridges: 12 vehicle bridges including 9th Ave SE, one rail bridge, one LRT bridge and 8 pedestrian bridges.

Water infrastructure: Glenmore Reservoir and dam; two water treatment plants, three wastewater treatment plants including Bonnybrook Wastewater Treatment Plant and Fish Creek Wastewater Treatment Plant, over 350 stormwater outfalls on both the Bow and Elbow Rivers, and pump stations to dewater communities during high river events.

Electrical infrastructure: Enmax electrical sub stations, including #32 and #5

Municipal Infrastructure: Municipal Building complex, including City Hall and Council Chambers.

Section 2 Description of Water Issues

Please identify which are chronic issues (historical) and which occur occasionally. Please include design criteria for existing infrastructure, if applicable/available.

Flooding: ☒ Chronic ☐ Occasional ☐ Unknown

Has Flood Hazard Mapping been undertaken in your community? ☐ Yes ☐ No ☐ Unknown

If yes, please provide a copy with your Statement

Water Issues:

As noted in the 2014 Report from the Expert Management Panel on River Flood mitigation, Calgary is located at the confluence of two mountain rivers, which are subject to rapid development of flood conditions. The waterways flow from the steep Rocky Mountains through the foothills towards Calgary, passing through various ecosystems and landscapes before reaching the city. The amount of storage, such as reservoirs, lakes and wetlands in the watershed is not large enough to completely buffer the wide range of precipitation experienced in the watershed. Therefore, the watershed is prone to both flood and drought.

Over the past century a portion of Calgary has been developed within the floodplain and, as a result, many communities situated along the Bow and Elbow Rivers are inherently at risk of flooding. These risks can be managed, in part, through proposed works by The City of Calgary to enhance the overall resiliency of the community to future flood and drought events, including those submitted under this provincial funding program. Additional approaches such as land use Flood Hazard Area policy to manage flood plain development are also being developed.

Some areas along the Elbow River flood significantly during flood events as low as 1:20 year events. In a 1:100 year event, as experienced in 2013, sections of downtown and numerous residential areas are subject to overland flooding and groundwater upwelling. Recent major floods occurred in 2013 (1:100 year event on the Elbow River) and in 2005 (1:10 year event on the Bow River and 1:20 year event on the Elbow River).

Most of the well-vegetated, healthy riparian areas withstood the forces of the river during the 2013 floods. Therefore, it is important for The City of Calgary to take initiative to maintain and improve the health of riparian areas in Calgary. Implementing strategies to restore or enhance riparian health will help attenuate

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some of the flow during some high water events and prevent erosion, bank loss, and infrastructure damage. The City has developed Design Guidelines for Erosion and Flood Control for Streambank and Riparian Stability Restoration that can be used for riparian restoration using plantings and/or bioengineering techniques.

Water quality conditions are a concern in the Bow River, particularly with respect to cumulative, chronic impacts on aquatic health and fish habitat. The City of Calgary has developed a Total Loading Management Plan (TLMP) for pollutants of concern, including Total Suspended Solids, and utilizes these objectives for planning purposes to inform future actions, including those related to wastewater, stormwater, and watershed management. One of the city's strategies to manage total loadings is to mitigate the contribution of riparian erosion towards sediment and phosphorus loads.

Elbow River Large-Scale Capital Works:

The Province is considering investing in one or more large scale flood mitigation capital works project on the Elbow River upstream of Calgary. Decisions on these works are anticipated in 2015 - 2016. Until these decisions are made by the Province, investment decisions by The City on the Elbow River cannot be made with full information on the level of risk that will remain in these areas. The level of risk and the priority of investments along the Elbow River within The City will continue to be assessed as information on upstream works becomes available. In the meantime, projects along the Elbow River that protect the downtown core, critical infrastructure, and residential areas under current conditions are being explored where opportunities allow. Specifically, the opportunity for permanent flood barriers on the Elbow River is currently being assessed and those that are identified as high value investments may be submitted to this funding program in 2015 and 2016.

Flood Hazard Mapping:

Provincial Flood Hazard Mapping has been prepared for The City of Calgary on Bow and Elbow Rivers. The Government of Alberta Flood Hazard Map (1996 model updates) is embedded in the City's Land Use Bylaw and available on (<http://www.envinfo.gov.ab.ca/FloodHazard/>). The City of Calgary also produces its own flood inundation maps for different flood scenarios. These interactive inundation maps are available at CITYonline.

Erosion: ☐ Chronic ☒ Occasional ☐ Unknown

Erosion is a naturally occurring event, and is more predominant during high water and flood events, specifically along riverbanks and escarpments.

About 35 km of riverbanks were severely eroded along the Bow and Elbow Rivers during the 2013 flood. The erosion impacted infrastructure located on or near the riverbanks. Erosion protection is required to protect outfalls, maintain stormwater service, and prevent overland flooding of communities and roadways.

Most of the well-vegetated, healthy riparian areas in Calgary withstood the forces of the river during the 2013 floods. Therefore, it is important for The City of Calgary to take initiative to maintain and improve the health of riparian areas in Calgary. Implementing strategies to restore or enhance riparian health will help attenuate some of the flow during some high water events and prevent erosion, bank loss, and infrastructure damage. Proactive restoration of riparian health also has the potential to reduce the need for expensive and environmentally disruptive bank hardening in response to future flood events.

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Debris flows: ☐ Chronic ☒ Occasional ☐ Unknown

Debris flows are a naturally occurring event, more predominant during high water and flood events. During the 2013 flood, debris in The City of Calgary primarily consisted of trees, vegetation and sediment often getting entangled on bridges, roads, other structures and shorelines. Most debris was captured in the Glenmore and Bearspaw Reservoirs. After the 2013 flood, several damaged pedestrian bridges over the Elbow River in Calgary were redesigned so they do not constrict the river channel and allow more space for the river to flood, also reducing the likelihood that these important pieces of infrastructure will be damaged in future floods.

Drought: ☐ Chronic ☒ Occasional ☐ Unknown

Municipal drought is a water management challenge in the Calgary region. Drought occurs occasionally, as the city is situated in a prairie grassland environment which historically has naturally occurring cycles of drought. The City of Calgary's Drought Management Plan (2011) cites growing evidence that suggests the severity of droughts in the Calgary region could get worse in the future. The plan found that despite higher water demand in the summer, competing irrigation and hydropower water management considerations, the most critical scenario for municipal drought would likely be from late winter through early spring. Upgrading the Glenmore Dam with steel gates and elevated hoists will allow The City to effectively double winter water storage capacity in the Glenmore Reservoir.

Section 3 Description of Long-term Community Resilience Goals / Priorities

Please describe your community's long-term resilience goals and identify specific areas of the community that are most vital to achieve long-term resilience within the community.

Calgary's 2014 Report from the Expert Management Panel on River Flood Mitigation outlines 27 recommendations for how Calgary can become more resilient to future flood events. The recommendations include specific reference to capital investments that can provide additional protection to residents, as well as the need to protect critical infrastructure to higher levels.

Specific recommendations include:

- Create graduated flood protection level requirements for City infrastructure.
- Increase the operating water storage capacity of the Glenmore Reservoir on the Elbow River through modifications to the Glenmore Dam.
- Construct additional or higher flood barriers in key locations throughout the city within the watersheds and update temporary flood barrier plans to protect against higher flood levels.
- Prepare a time-phased plan to modify structures that constrain river flow during flood events, such as

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pathways and bridges.

The City is now preparing a plan for how to implement all 27 recommendations from the Expert Management Panel report. Projects submitted to the ACRP program will be critical for supporting The City's efforts to achieve greater resiliency in line with the recommendations.

While setting flood protection level requirements for City infrastructure will take time to complete, evidence from the 2013 flood indicates that there are key components of The City's infrastructure that require additional protection to ensure that services can be maintained to residents during and in the immediate aftermath of future flood events. These key components include the Bonnybrook Wastewater Treatment Plant and the municipal complex.

Flood prone areas of Calgary that are considered the most vital to protect for ensuring public safety and the continuity of essential services include: Calgary's water supply sources, water and wastewater treatment plants, transportation corridors, bridges, utilities, low-elevation residential communities and the high density downtown.

Section 4 Project Priority

Please provide a list of specific projects that could allow your community to meet/address its identified priorities. Projects **must** be placed in priority order. Note that we do not require a detailed project description at this point; the intent is to simply give an idea of what may be submitted and its overall priority to the community.

Projects prioritized for the 2014 September 30 are listed in Attachment #1 - ACRP Priority Projects for 2014.

Specific projects eligible beyond 2014 will be prioritized by Calgary City Council for the 2015 March submission upon the review of the funding available for the cost share obligations, the project management capacity and immediate need for resiliency for Calgary's infrastructure.

The future projects may include:

Water infrastructure – Flood protection for Bonnybrook and Fish Creek Wastewater Treatment Plants

Permanent flood barriers in specific locations that will be identified through ongoing assessments, in particular those that protect critical access /egress routes, wastewater treatment plants, electrical substations, the downtown core, residential areas, and LRT underpasses.

Transportation infrastructure – improved resiliency of bridges

Municipal infrastructure - Municipal complex and key buildings flood resiliency

Riparian restoration sites along multiple water courses.

Calgary Civic Partners

Section 5 Watershed Assessment

Please provide an assessment of how the works proposed by the applicant maintain and potentially enhance the health of the watershed and sub-watersheds the community is located in. Please identify how the project(s) will enhance the overall resilience of the community in future flood and drought events. The components of this assessment should include:

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Provide an overview of any other mitigation options considered, including non-structural options such as wetland assessment and riparian protection.

Of the six themes highlighted in the 2014 Report from the Expert Management Panel, three key themes below and their recommendations align with the criteria and objectives of the ACRP for improving flood resiliency through a watershed-scale approach.

Watershed Management

Restoring riparian areas improves watershed health and increases resiliency to both natural and human disturbances. Restoring healthy, well-vegetated riparian areas allows them to naturally moderate impacts such as flooding and drought. Mitigating potential flood or erosion damage helps to maintain ecosystem health and adds recreational value. Riparian restoration projects submitted to ACRP will support healthier riparian ecosystems and flood resilience through The City.

Storage and Protection

Installing flood protection barriers will enhance flood protection up to a 1:100 year event in several areas of the city, preventing inundation from floodwaters into public transportation corridors, electrical substations, and residential, commercial development, and high density downtown areas. Some of these areas have been inundated during a 1:20 year flood event.

Replacing Calgary's Glenmore Dam gates and adding hoists will reduce damage downstream in a flood event, and significantly increase drinking water storage through winter season, reducing vulnerability to potential drought.

Infrastructure Resiliency

Flood resiliency measures for Calgary's two wastewater treatment plants will allow continuity of plant operations during and following a flood event, protecting significant municipal investments, and protecting river water quality downstream after an event.

Preventing backflow from the river via stormwater outfalls during high river events and ensuring that water can be pumped out of the lowest elevation areas protects communities in the event of a flood.

Upgrades to traffic and pedestrian bridges designed and built with more resiliency for future high water events, which may include but not be limited to raising the bridge, reducing number of piers, and increasing area for water flow under the bridge, will ensure continued service of these essential transportation routes during and immediately following flood events.

Identify any relationship to other projects being proposed by other communities in the watershed.

Led by WaterSmart, the 2014 Bow Basin Flood Mitigation Watershed Management Project, which The City of Calgary and other regional municipalities participated in, identified a number of solutions that align with and complement The City of Calgary's priorities for flood and drought management.

Other communities in the watershed, including Rocky View County and the Town of Cochrane (Environmental Action Committee) have been and continue to take initiatives to conserve and restore riparian areas at specific sites. Restoration of riparian areas upstream and downstream from Calgary complements planned riparian restoration activities within Calgary.

Please engage your local Watershed Planning and Advisory Council (WPAC), and identify how the projects proposed by the applicant fit within the WPAC's Integrated Watershed Management Plan, if applicable.

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The Bow River Basin Council participated with The City of Calgary and other regional municipalities and stakeholders in WaterSmart's Bow Basin Flood Mitigation and Watershed Management Project. The project supports initiatives that restore natural river functions to slow and detain high river flows, including maintaining healthy riparian areas and bio-engineered bank protection.

As part of the implementation of the Bow Basin Watershed Management Plan (2012), municipalities and NGO's in the basin are working together with the BRBC to move recommendation forwards. A key component of the plan is to prevent further degradation of riparian areas and restore degraded riparian lands. The City of Calgary is in communication with the BRBC regarding the projects submitted to the ACRP and how watershed considerations can be included in their implementation.

The City of Calgary is also involved with the Elbow River Watershed Partnership, the Nose Creek Watershed Partnership, and the Ghost Watershed Alliance Society. Through these partnerships, the City works with stakeholders to help implement recommendations of the Bow Basin Watershed Management Plan, as well as more specific plans pertaining to the sub-basins.

Contact Name: TBD

Date: September 30, 2014

Signature:

Freedom of Information

The Applicant acknowledges that the *Freedom of Information and Protection of Privacy Act* applies to all information and records provided by the Applicant to the Minister and to any information and records which are in the custody or under the control of the Minister.