Welcome

Sunnyside Flood Barrier height recommendation

What will be covered:

- Results from the evaluation of the four flood barrier options

1 in 20-year flood level	1 in 50-year flood level	1 in 100-year flood level	1 in 200-year flood level

- Next steps for the project and construction timelines.

Protecting Sunnyside from flooding

There will always be a risk of flooding in Calgary, but we have a four-part plan to reduce its impact.

1 Enhanced TransAlta operations of the Ghost Reservoir

Supporting the continuation of the existing Government of Alberta and TransAlta agreement to use the upstream Ghost Reservoir to capture more flood water.

2 A new upstream reservoir on the Bow River

Working with the Government of Alberta, a new reservoir on the Bow River would capture more water from large floods, as well as provide an additional source of water supply for drought management.

3 Community flood barriers

As the reservoir reaches capacity and is forced to release water, permanent barriers help reduce overland river flooding during these large flood events.

4 Property level mitigation and policies

Policies, bylaws, land use regulations, building codes, possible incentive programs for flood proofing and public education.

20-0004671

Sunnyside Flood Barrier

Project goals

To reduce the flood risk for Sunnyside residents and critical infrastructure in the area with a solution that:

- Reflects the values and priorities of the community.
- Enhances the well-being of the community.
- Provides good value for money invested.
- Minimizes impact to the natural environment.
- Works in tandem with upstream reservoirs to mitigate a minimum 2013-level flood.
- Is adaptable to future uncertainties.
- Balances the community-specific needs with the need for a strong, city-wide flood resilience plan.

Exploring four options and their trade-offs

Working with the community, we explored four different flood barrier height options and considered their trade-offs.

	Total length	Average height	Impact on river views	Impact on trees	Cost
1 in 20-year flood level	1.1 km	0.3 m (1 ft)	All views maintained	Least	$8 M
1 in 50-year flood level	2.3 km	0.8 m (2.6 ft)	All views maintained	Moderate	$19 M
1 in 100-year flood level	2.5 km	1.1 m (3.6 ft)	Street-level views reduced	Moderate	$28 M
1 in 200-year flood level	2.7 km	1.6 m (5.2 ft)	Street-level views reduced	Most	$38 M

Phase 1:
Studies and community engagement

- During this stage, we worked with the community to gather input on community values, key concerns and other factors that should be considered in the design.
- We conducted various engineering studies which informed the design options.
- We also shared the design options with the community and gathered their feedback on the benefits and trade-offs.

6 STAKEHOLDER CHECK-INS

WITH THE HSCA – EMERGENCY PLANNING AND RESPONSE COMMITTEE

2 PROJECT POP-UPS

IN THE COMMUNITY

2 COMMUNITY OPEN HOUSES

WITH PARALLEL ONLINE SURVEYS

- Over 250 comments received that helped shape technical studies in the area
- Over 1,200 comments received about the social criteria and the benefits/concerns of the four barrier height options.

18 MONTHS

OF STUDIES AND DESIGN, INCLUDING:

- Geotechnical
- Groundwater
- River modelling
- Tree inventory
- Environmental review

How a barrier option is chosen

The City uses a Triple Bottom Line approach to guide all decision-making. This means they consider the social, economic and environmental impacts of a project.

Economic

An affordable and cost-effective infrastructure investment that provides good value for money.

It promotes an environment that attracts and retains local businesses and makes it a desirable area where citizens want to live.

Environmental

Flood mitigation that minimizes impacts to our rivers, natural areas and wildlife.

Social

Flood mitigation that supports the community's protection and enhances the neighbourhood, health and well-being of residents, and recreational opportunities.

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Recommended flood barrier height for Sunnyside:

1 in 100-year flood level

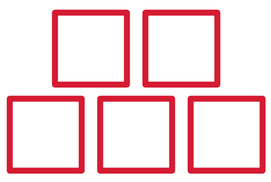
The results from the evaluation indicate this is the preferred option for Sunnyside for the following reasons:

Reduces 2013-level flood risk, which will be further reduced by current and future upstream reservoirs on the Bow River

Less disruptive to the community look and feel

Increases the ability to protect vulnerable populations

Meets the provincial and federal flood standard

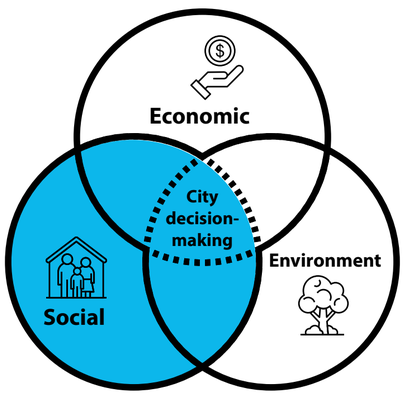


Provides building block for future climate resiliency

Evaluation breakdown:
Social

Goal

Flood mitigation that supports the community's protection and enhances the neighbourhood, health and well-being of residents, and recreational opportunities.



Evaluation criteria

- Provides the same flood protection amongst residential communities
- Protects vulnerable populations and services
- Improves mental well-being
- Maintains recreation and river access
- Maintains community fabric
- Maintains aesthetics of the area and pathways

Based on the above criteria, the options ranked as follows:

LEVEL	RANK	RATIONALE
1 in 20-year flood level	4th	• Does not improve flood-related stress and anxiety amongst residents • Provides the least protection for vulnerable populations
1 in 50-year flood level	3rd	• Minimal improvement in flood-related stress and anxiety • Vulnerable populations remain more at risk
☆ **1 in 100-year flood level**	1st	• Achieves the best balance of reducing the flood risk while maintaining the community fabric • Protects major emergency routes • Supports equality of flood protection amongst residential communities
1 in 200-year flood level	2nd	• Greatest impact on the existing community fabric • Creates inequality by providing a greater level of protection than other residential communities • More disruptive to the community aesthetics and river access

Evaluation breakdown:
Environment

Goal

Flood mitigation that minimizes impacts to our rivers, natural areas and wildlife.

Evaluation criteria

- Protects the surrounding land adjacent to the river
- Supports a healthy river and allows room for the river to flow
- Protects the river water quality by reducing the risk of contamination from overland flooding
- Minimizes the impact on trees

Based on the above criteria, the options ranked as follows:

LEVEL	RANK	RATIONALE
1 in 20-year flood level	1st	• Least impact on trees and the natural environment
1 in 50-year flood level	2nd	• Moderate loss of trees and more disruptive to the natural environment • The loss of trees for the 1 in 50-year and 1 in 100-year flood level options are comparable
1 in 100-year flood level	2nd	
1 in 200-year flood level	3rd	• Substantial loss of trees. Nearly double the number of trees would be lost compared to the 1 in 100-year and 1 in 50-year flood level options.

Evaluation breakdown: **Economic**

Goal

An affordable and cost-effective infrastructure investment that provides good value for money. It promotes an environment that attracts and retains local businesses and makes it an area where citizens want to live.

Evaluation criteria

- Protects critical infrastructure, essential services and roads
- Protects homes and businesses
- Cost
- Relies on upstream flood mitigation to achieve provincial and federal flood standard (1 in 100-year flood level)
- Requires additional funding beyond the current budget
- Construction timeline and impact on the risk of exposure to flood, disruption to community and amenities
- Provides greater flexibility for emergency response planning

Based on the above criteria, the options ranked as follows:

LEVEL	RANK	RATIONALE
1 in 20-year flood level	3rd	• Increased risk to critical infrastructure, essential services and roads compared to other options • Relies on a new upstream reservoir on the Bow River to meet the provincial and federal standard for level of protection (1 in 100-year flood level)
1 in 50-year flood level	4th	• Relies on a new upstream reservoir on the Bow River to meet the provincial and federal standard for level of protection (1 in 100-year flood level) • The risk to critical infrastructure, essential services and roads is less than the 1 in 20-year option, but it still remains
☆ **1 in 100-year flood level**	1st	• Project costs can be funded with some additional budget • Flood protection benefits significantly outweigh the costs compared to the 1 in 20-year and 1 in 50-year options • Independently meets the provincial and federal standard for level of protection (1 in 100-year flood level)
1 in 200-year flood level	2nd	• Provides high level of protection for homes, businesses and critical infrastructure • Projected cost is 4.5x more than 1 in 20-year flood option. This would significantly impact The City's ability to deliver other community drainage projects in Sunnyside and other communities.

Summary of results

Based on the complete Triple Bottom Line evaluation, the options ranked as follows:

LEVEL	RANK
1 in 20-year flood level	4th
1 in 50-year flood level	3rd
1 in 100-year flood level	1st * The 1 in 100-year flood barrier level will include the ability to expand the height, if necessary, in the future.
1 in 200-year flood level	2nd

Next steps

Council decision on barrier height

On April 15, the 1 in 100-year flood level barrier will be recommended to Council via the Standing Policy Committee for Utilities and Corporate Services.

Groundwater studies

The groundwater evaluation is still underway. Results and recommendations are expected to be shared with the community late spring 2020.

Finalize design

Pending Council approval of the barrier height, we will refine the design and seek regulatory approvals.

Construction

Our aim is to complete construction of the flood barrier in time for 2022 flood season.

WE ARE HERE

2016	2017	2018 – 2020	2020	2021 – 2022
Community engagement on Flood Mitigation Measures Assessment	Council approval – Calgary's Flood Mitigation Strategy	**Phase 1 Studies and community engagement**	**Phase 2** Final design and regulatory approvals	**Phase 3** Construction (pending regulatory approvals)