

Calgary



ICS: Unrestricted

A photograph of the Calgary skyline at dusk or dawn. In the foreground, a bridge with a distinctive red, lattice-like structure spans across the frame. The background shows several tall, modern glass skyscrapers reflecting the sky, with some older buildings visible to the left. The sky is a mix of light blue and white, suggesting a clear day. The water in the foreground is calm, reflecting the light from the sky and the bridge.

**Community Advisory
Group – Meeting #8**

November 15, 2016



1. Welcome
2. Flood Mitigation Updates
3. Review of Meeting #7: IBI Project & Sustainability Assessment
4. Public Engagement Update

Break

5. Project Next Steps
6. CAG Next Steps
7. Wrap-up



- **Bow River Working Group Update**
 - Next meeting is December 7 & 8 to finalize their advice on flood mitigation scenario modeling
 - Full report goes to the Government of Alberta in spring 2017
- **Federal Funding Announcement:**
 - \$10.46 million to support two projects:
 - Bonnybrook wastewater treatment plant berm
 - Sunnyside Pump station #1
- **Construction Updates**
 - West Eau Claire out for tender for spring construction
 - Centre Street in detailed design
 - Heritage Drive barrier and 9th Avenue Bridge projects in preliminary design

Flood Mitigations Measures Assessment Update on Findings



**Concept Analysis:
Flood Damages**



Flood Mitigation Measures Assessment

- In 2015, The City of Calgary hired IBI Group to assess how much damage floods could do in Calgary.
- Their model looked at the latest hydrology, groundwater, social and environmental considerations.



Buildings &
contents
affected by
floodwater



Displacement
Business interruption
Traffic disruption
Stress
Loss of life
Health effects
Loss of recreation
Loss of community services
Environmental damage





Flood Mitigation Measures Assessment

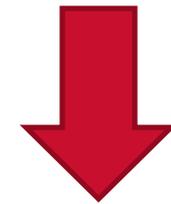
In Calgary, without any mitigation, floods over the next 100 years could cause damage equal to

\$170M / year

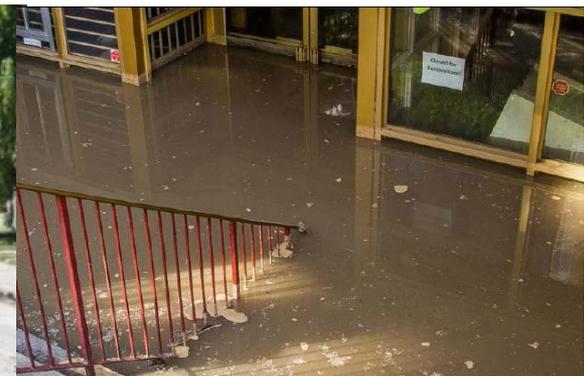
("average annual damages")

But we have some mitigation in place and more being built. This mitigation, including projects built since 2013, reduces the potential flood damage to

\$115M / year



30%

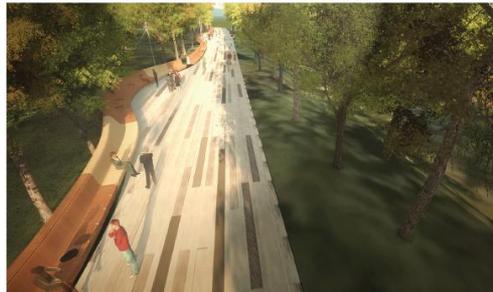




What is The City doing?

Mitigation projects

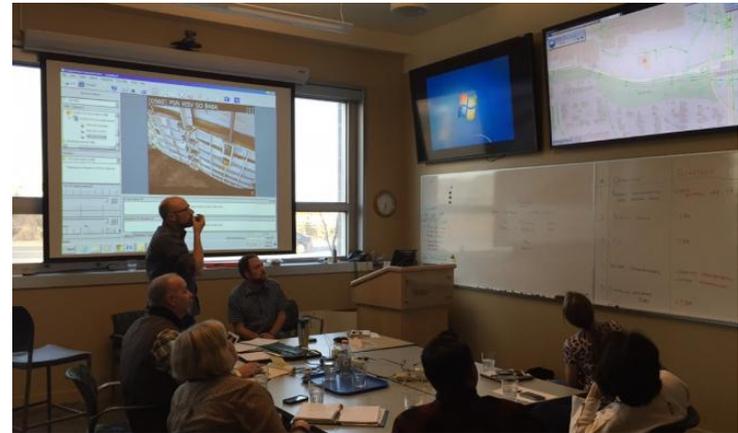
- Installing gates on the crest of Glenmore Dam.
- Barriers at Bonnybrook, Centre Street Bridge, Heritage/Deerfoot, West Eau Claire, the Zoo.
- Removal of river channel constrictions (debris, select gravel bars).
- Stormwater outfall gates to prevent river backup into communities.
- Improvements to storm and sanitary lift stations.





What is The City doing?

- Emergency response plans.





Bank repair and protection



Elbow River at Ramsay



Riverdale Ave



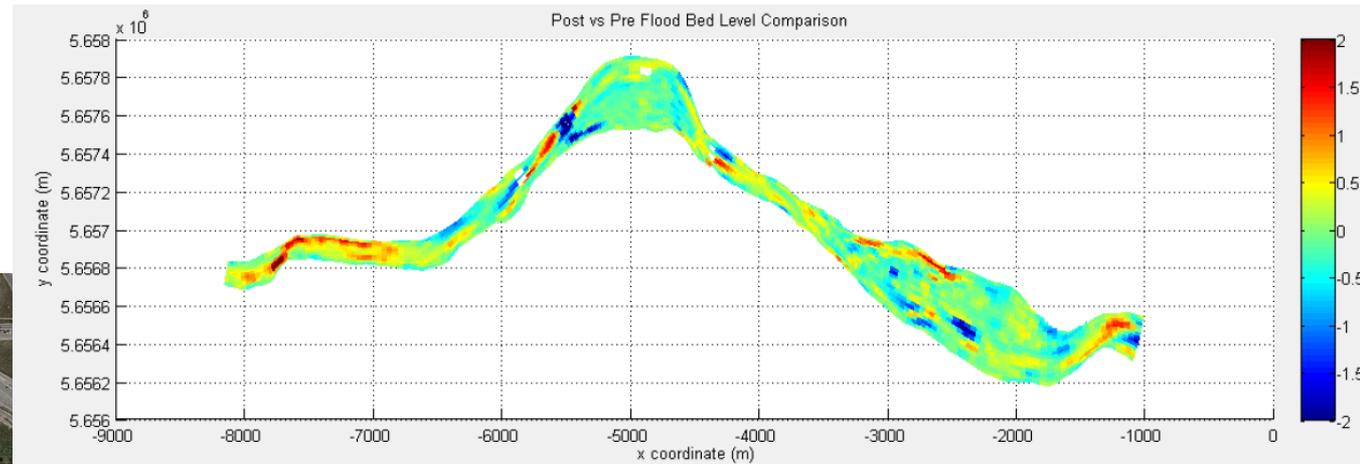
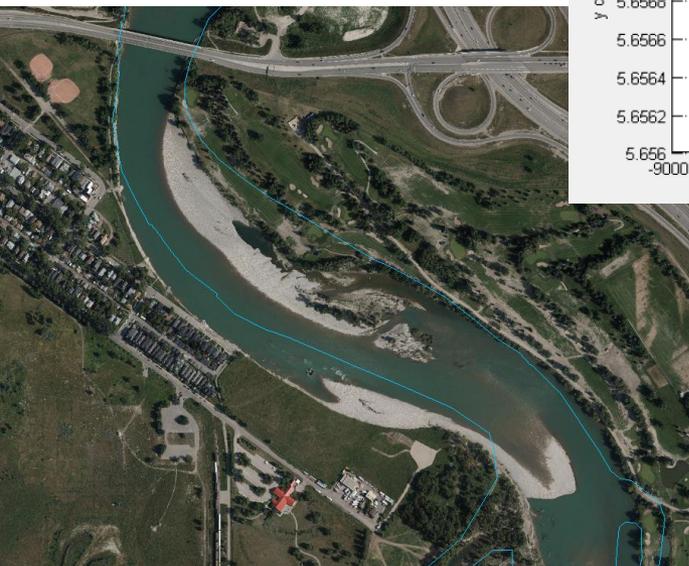
Discovery Ridge



Bow River at Glenmore Trail

What is The City doing?

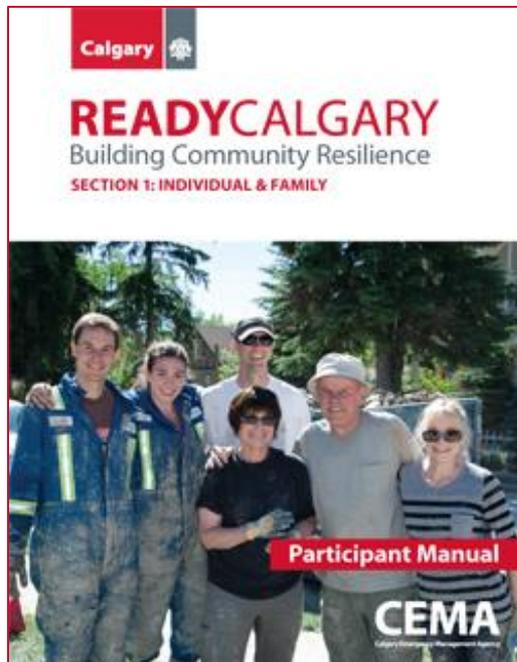
- Updated flood policy in MDP and Land Use Bylaws.
- Studies of the river to understand how it changed in 2013, and how it will change in the future.





What is The City doing?

- Helping businesses, organizations and citizens and communities build resilience.
- Collecting input on how Calgarians view flood resiliency, river health and flood mitigation.

The cover of the "Flood Mitigation Measures Assessment Welcome!" document. It features the City of Calgary logo at the top left, the title "Flood Mitigation Measures Assessment Welcome!" in large, bold, red and black text, and a photograph of a city skyline with a river and a bridge. Below the title, there is a list of bullet points and a paragraph of text.

During this session you will be able to:

- Review current flood mitigation measures and projects already underway.
- Learn about the scenarios and provide your input to help The City of Calgary develop recommendations for the flood mitigations measures.

Your feedback will help the project team to refine and finalize recommendations to be presented to Council in early 2017.

calgary.ca | contact 311



Mitigation Options

Existing/Underway

- **Technical / Structural**
 - Raising gates on Glenmore Dam
 - Modified operation of existing facilities (e.g., Ghost Reservoir)
 - Increasing river conveyance capacity
 - Bank stability
 - Healthy riparian areas
 - Springbank Reservoir (SR1)
 - Permanent Barriers (underway)
- **Non-structural**
 - Existing land use regulation
 - Emergency response
 - Improved forecasting, warning time
 - Education

For Discussion

- Springbank Reservoir (SR1)
- New reservoir on Bow River
- Permanent Barriers

- Flood-proofing buildings (e.g., elevating, flood gates)
- Removing buildings from the floodway
- Restricting land uses in flood hazard area



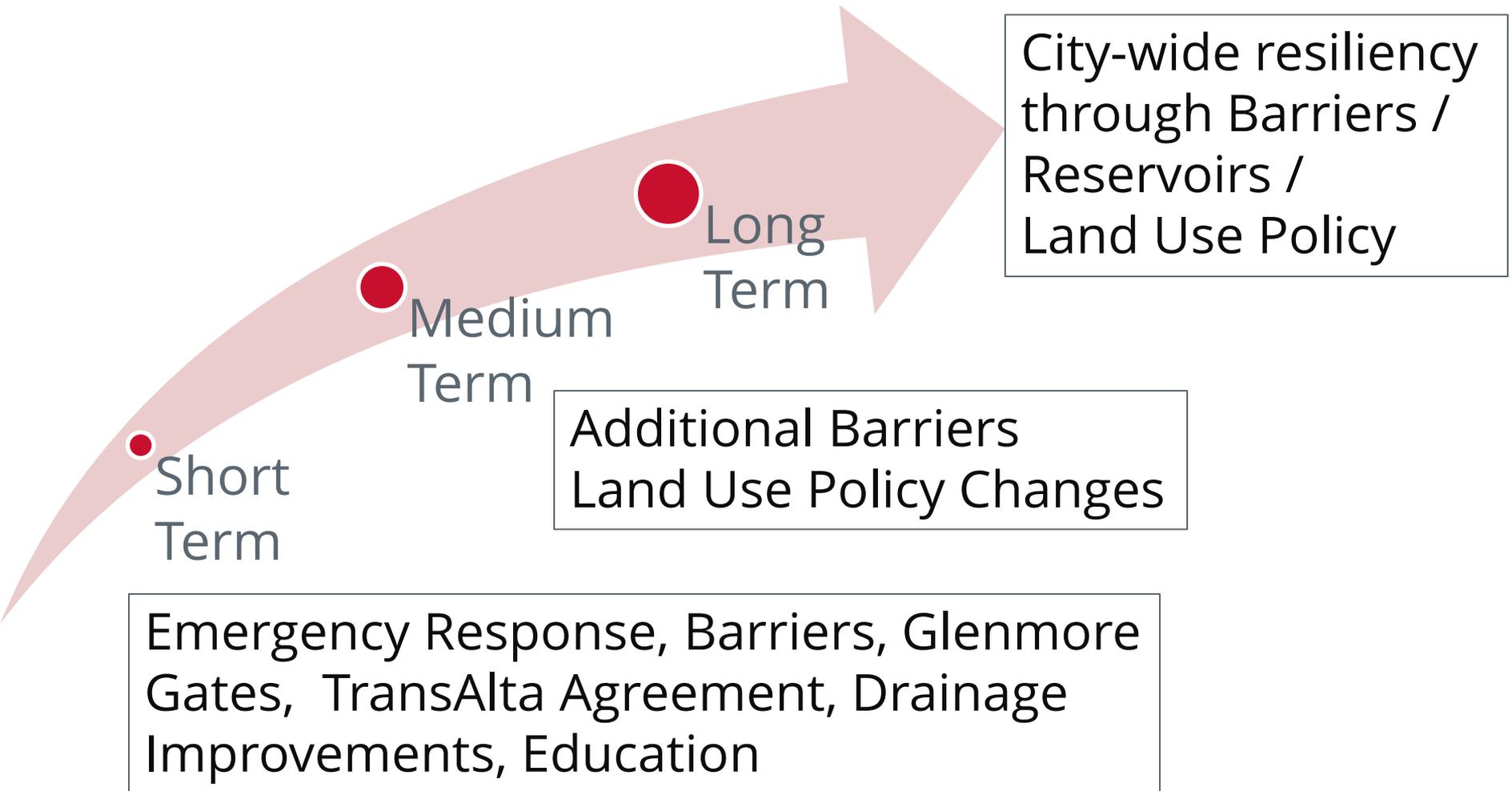
Uncertainties Remain

- River as a natural system
- Provincial Flood Mitigation
 - Springbank Reservoir
 - Bow River Working Group process
 - Updated floodplain mapping
 - New flood regulation/policy
- Federal Policy/Guidelines





Building A Pathway to Resiliency





Update on IBI's Flood Mitigation Measures Assessment

- ◆ IBI has continued to refine detailed analyses of different combinations of measures to strengthen the understanding of how to build solution(s):
 - ❖ Baselines (existing mitigation)
 - ❖ Various combinations of structural and non-structural measures
 - ❖ A combination of measures based on public input (analysis in progress)

- ◆ Our public engagement and sustainability analysis approach is helping us define optimal combinations of solutions.

Flood Mitigations Measures Assessment Update on Findings



Sustainability Analysis



Update on Sustainability Analysis

- ◆ Looks beyond just the flood damage a mitigation measure prevents
- ◆ Evaluates each mitigation concepts' impact on four categories:
 - ❖ Social
 - ❖ Environmental
 - ❖ Economic
 - ❖ Implementation
- ◆ Helps define an optimal combination of solutions.
- ◆ Results will help identify where improvements can be made – both in selecting and implementing the optimal combination of flood mitigation measures.



Sustainability Analysis criteria – 4 themes

Social well-being

- Complete communities
- Vulnerable populations
- Equitable protection
- River aesthetics
- Recreation access
- Emergency access
- Mental health
- Risk transparency

Ease of Implementation

- Timeliness of implementation
- Adaptability and flexibility
- Jurisdictional control
- Regulatory complexity

Environmental protection

- Water security
- Riparian health & ecosystem function
- Water quality & contamination prevention

Economic well-being

- Economic protection
- Cost to implement
- Cost-Benefit ratio
- Damages averted
- Residual damages

*Equal weight applied to each theme



Update on Sustainability Analysis

- ◆ We refined sustainability criteria and weightings based on:
 - ❖ The City's Triple Bottom Line Policy, Sustainability Direction, and watershed goals
 - ❖ CAG input from Environmental and Social Impacts Exercise (Meeting #6)
 - ❖ Input from issues identified in the Ispos Reid Community Values survey
 - ❖ IBI's expertise
 - ❖ Best practices in sustainability assessment
 - ❖ Internal Sustainability workshop with subject matter and sustainability experts from other departments.
 - ❖ Preliminary results from the October-November public engagement were considered.

- ◆ This approach is helping us define an optimal combination of solutions.

- ◆ Results will help identify where improvements can be made – both in selecting and implementing the optimal combination of flood mitigation measures.



Questions?





Project Next Steps

- Thank you for your input on Concepts 1-3 & Non-structural Measures
- Report going to the Standing Policy Committee (SPC) on Utilities and Corporate Services (UCS) in March or April (date to be confirmed)
- Standard report format with attachments
- Public Engagement/Input section will share the input received from citizens



CAG Activity: Perspectives on Flood Mitigation

For the final reporting for this project, City staff asked the Community Advisory Group members to share their views after their experience.

Question:

Please consider all the material that has been covered and reflect on your experience with this CAG. What are the 1-3 points you feel best capture what flood mitigation should look like for all of Calgary? (150 words max.)



Meeting	Topics
1.	<ul style="list-style-type: none">•Project Overview•Terms of Reference
2.	<ul style="list-style-type: none">•Terms of Reference Revisions•Set Ground Rules & Identified Expectations•Flood 101: flood mapping, risk, damage model, flood emergency preparedness
3.	<ul style="list-style-type: none">•Telephone survey results•Important considerations for flood mitigation option decision making
4.	<ul style="list-style-type: none">•Risk Management•Discussed flood risk and levels of protection and mitigation options
5.	<ul style="list-style-type: none">•Scenario Gallery Walk•Discussion on Interim Measures
6.	<ul style="list-style-type: none">•Environmental and social impact assessment exercise•Input on fall public engagement session



Meeting	Topics
August Technical Session	<ul style="list-style-type: none"> •Assessment of revised mitigation scenarios by IBI •Completion of the Permanent Barrier Study •Public engagement session planning •Riparian qualitative research
7.	<ul style="list-style-type: none"> •CAG review and input on the scenario assessments
September /October	<ul style="list-style-type: none"> •Public engagement sessions to gather input on the scenario assessments from citizens
Tonight	<ul style="list-style-type: none"> •Update on Flood Mitigation Measures Assessment Project •ISL Presentation on public engagement sessions •Project Next Steps •CAG Next Steps
<p>Proposed February Meeting (date to be confirmed)</p>	<ul style="list-style-type: none"> •Presentation of Administration’s Report to Council •How to participate in Standing Policy Committee & Council meetings



CAG Perspective on The Advisory Group Process

To help staff present how citizens have been engaged on this project, City staff would your input on the advisory group process.

Question:

Having experienced the CAG, do you feel that the group helped bring citizens' voices and values to the decision making process? Please share 1-3 ideas about how/why or how/why not.



- Date for February meeting will be confirmed by Staff
- Review of any follow-up actions from this meeting

Thank you.