

Calgary



Community Advisory Group – Meeting #1

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March 15, 2016

Flood Mitigation Community
Advisory Group, Meeting #1



Outline

- Overview - 2013
- Context – After the Flood
- Work for 2016 (Flood Mitigation Measures Assessment and Community Engagement)
- Key information
 - Land Use Policy
 - Overview of mitigation measures

Calgary

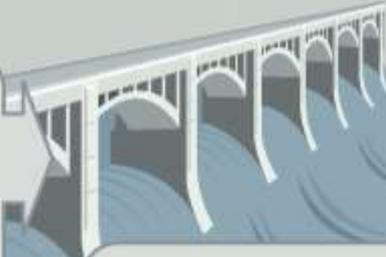




1
THE **FLOOD**



The Bow river flows peaked at **2,400 m³/second, 8x** the regular flow and more than **3x the 2005 flood.**



The Elbow river inflow peaked at **1,240 m³/second, 12x** the regular rate and more than **3x the 2005 flood.**

Outflow below the Glenmore Dam was **700 m³/second,** about **7x normal** and about **2.5x the 2005 flood.**



2
THE **FALLOUT**



Evacuations in **32 communities** affected **110,000** Calgarians.



More than **1,600 people** registered at community support centres on the first day.



16 LRT stations were closed.

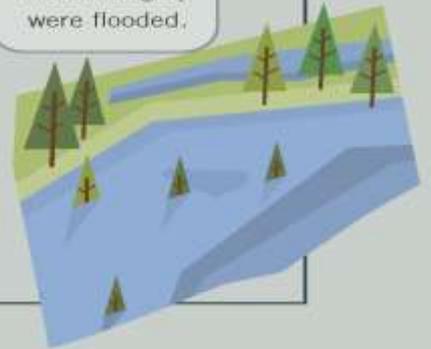
More than 20 bridges were closed.

30 parks across Calgary were flooded.



More than 50 bus routes were cancelled or detoured.

34,000 locations were without power.



- The Recovery Operations Centre (ROC) was initiated to coordinate recovery (until fall 2015)
- The Flood Recovery Task Force provided leadership, within the City of Calgary and the Calgary community, to identify and resource immediate flood recovery activities



Expert Management Panel on River Flood Mitigation

- In July 2013, the River Flood Mitigation Program was established to develop a plan around flood mitigation and resilience
- We are currently working through the 27 recommendations of the Expert Management Panel on River Flood Mitigation.
- Recommendations comprise a holistic program to achieve flood mitigation and community resilience





Flood Resiliency Strategy

Resiliency – capacity to endure and recover from disruptive events. Resilience requires appropriate action before, during and after an event to minimize negative effects. A more resilient city suffers less impact when disasters occur and recovers more quickly.



INTEGRATED WATERSHED MANAGEMENT

Everyone participates in protecting our precious resource of water –
The City, the community and the region

2

GOAL:
USE WATER WISELY

1

GOAL:
PROTECT OUR WATER SUPPLY

4

GOAL:
BUILD RESILIENCY TO FLOODING

3

GOAL:
KEEP OUR RIVERS CLEAN

5

GOAL:
BE GOOD NEIGHBOURS

BEARSPAW
WATER TREATMENT PLANT

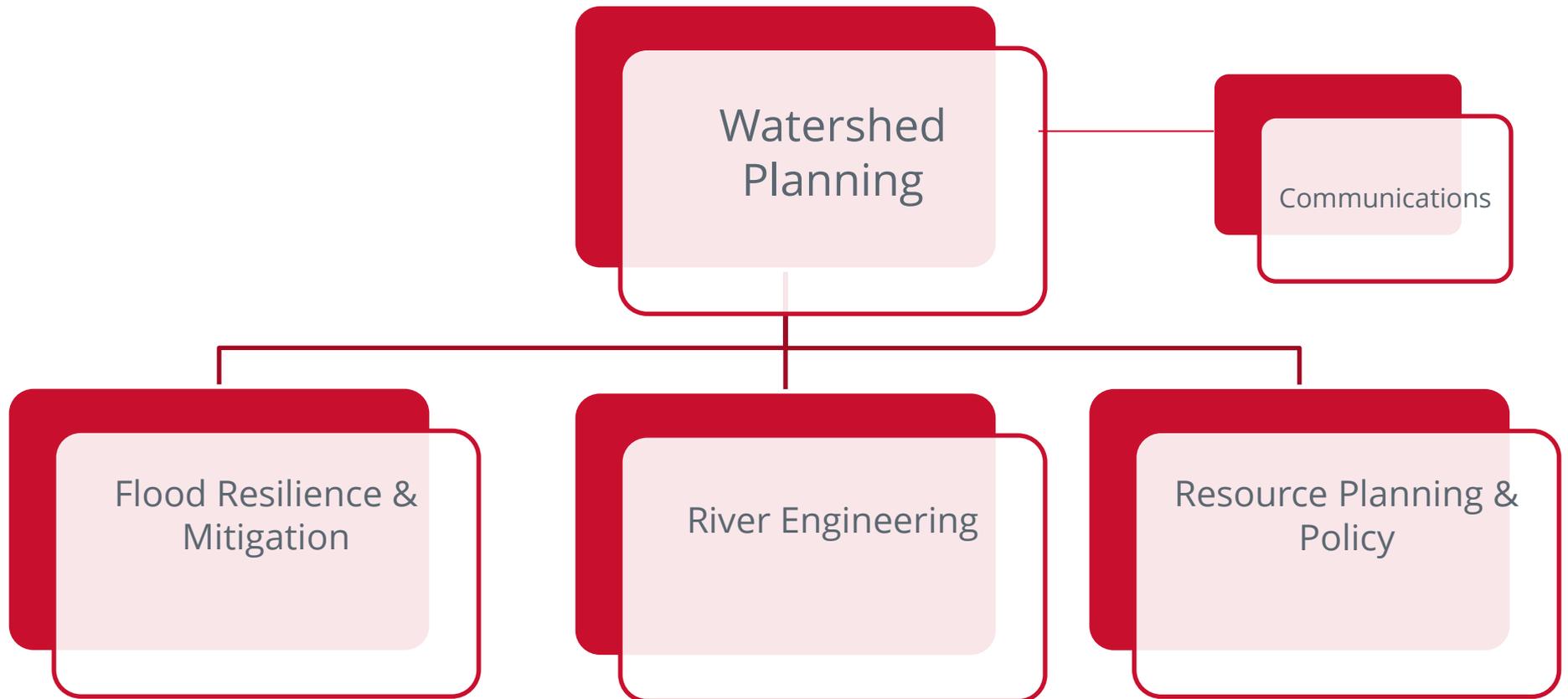
GLENMORE
WATER TREATMENT PLANT

BONNYBROOK
WASTEWATER TREATMENT PLANT





Watershed Planning Division in Water Resources





City of Calgary Flood Resiliency and Mitigation

- Completed or on-going flood mitigation work:
 - Technical understanding of our rivers (studies), updated FERM, bank stabilization projects, stormwater outfall improvements and several barriers restored or built
- ACRP funding totaling \$27.7 million for six key projects
 - Glenmore gates, Heritage Drive permanent barrier, Centre St. Lower Bridge deck flood barrier, stormwater outfall gate improvements, Bonnybrook WWTP flood mitigation program and West Eau Claire flood barrier



Understanding Flood Risk

- Updated the Government of Alberta's Flood Damage Assessment Study
- Provided citizens with new flood inundation maps (5, 10, 20, 50 and 100 year events) on calgary.ca/floodinfo
- Updated Flood Emergency Reference Manual (FERM) based on new mapping information
- Installed 14 temporary river level monitoring stations within Calgary on the Bow and Elbow Rivers to monitor ice jams
- Undertook river morphology and fish habitat studies
- Initiated project to explore climate modelling specific to our regional watersheds

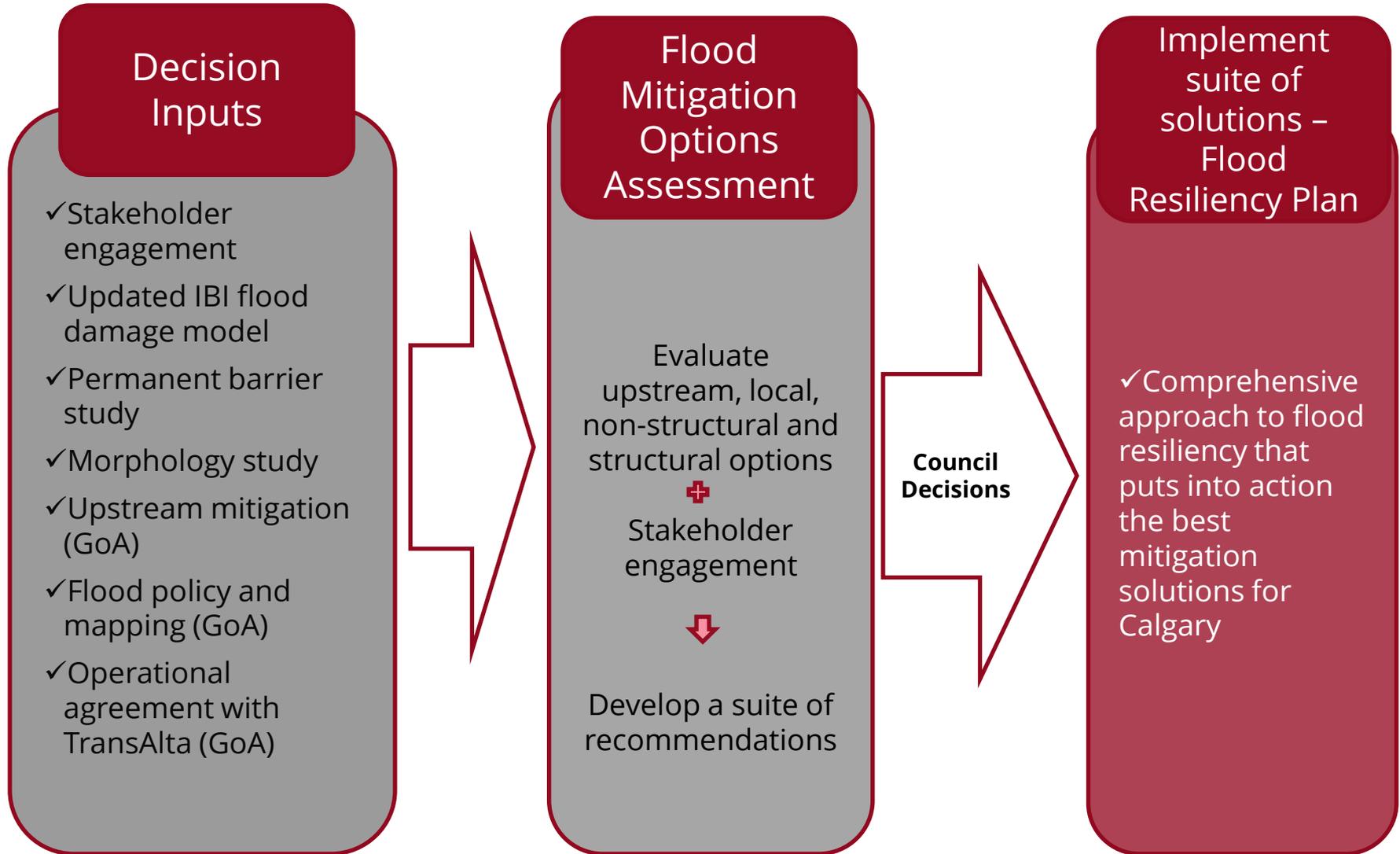


Flood Mitigation Measures Assessment

- Updated the Provincial Flood Damage Curve Assessment Study with latest hydrology, Triple Bottom Line (TBL) considerations and refined groundwater criteria
- Perform a TBL assessment of all flood mitigation options for the Elbow and Bow Rivers including upstream mitigation, local barriers, land use policy and non-structural measures
- Assessment will consider community input to understand community values, needs, perspectives, improve decision-making and provide education



Implementing Calgary's flood resiliency & mitigation options analysis





Why is community engagement important?

- Including community voices builds a deeper understanding of community needs and perspectives.
- Considering community input improves decisions to plan the best solutions for flood mitigation.
- Involving citizens in decision-making allows better appreciation of why decisions are made.
- Helps The City provide information and education about the complexities of flooding and mitigation and everyone's role in building flood resiliency.

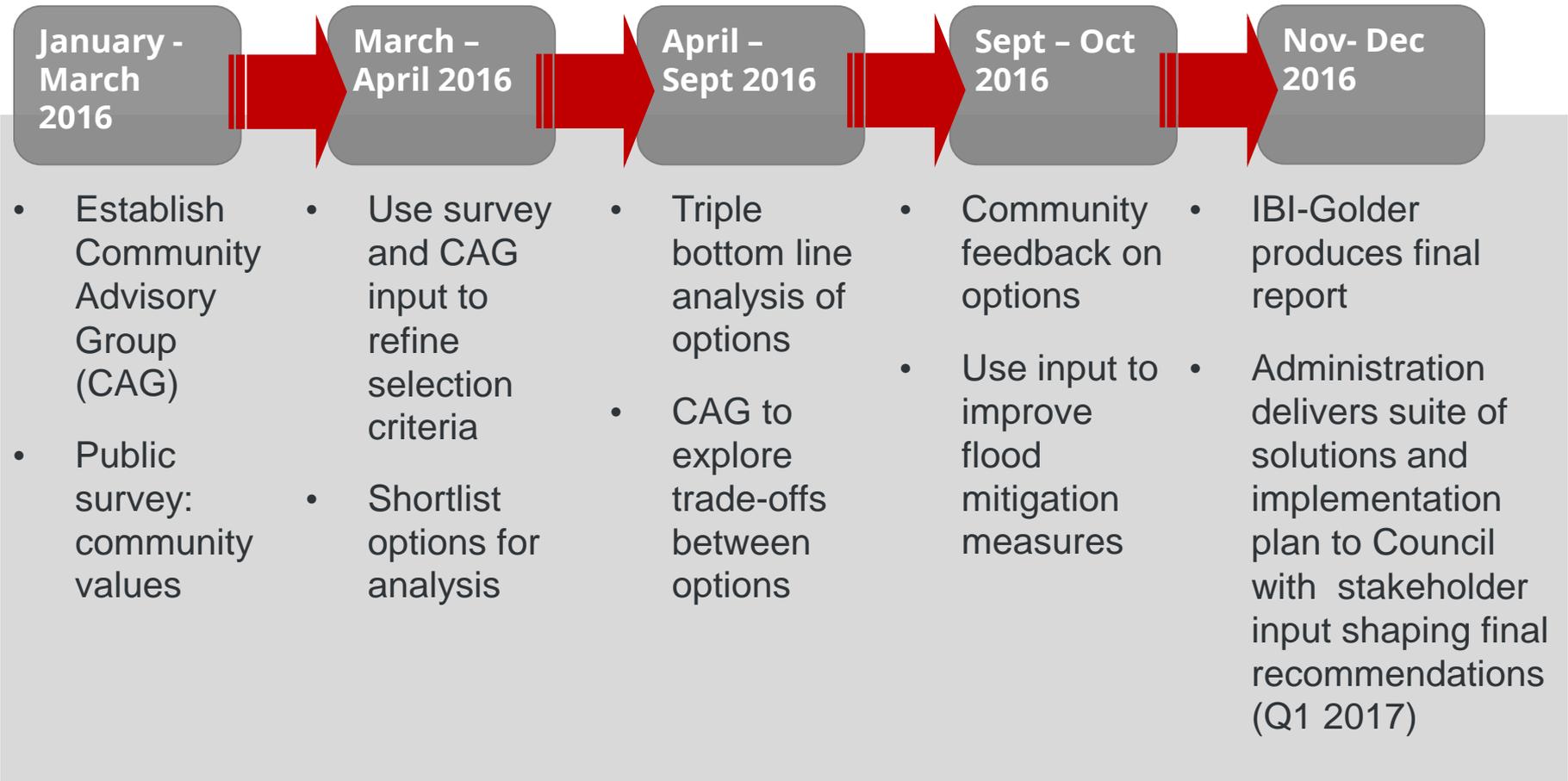


Community Engagement Approach

- Public Survey (March-April)
 - gauge citizens' opinions on how the floodplain should be used and will inform screening criteria for option analysis
- Community Advisory Group (March-November)
 - Provide input into screening criteria for options analysis and delivery of community engagement, review mitigation options and liaison to respective stakeholder groups
- Community and stakeholder feedback on flood mitigation measures (September – October)
 - Engage communities and stakeholder groups to provide feedback on flood mitigation measures
- Provide a prioritized list of flood mitigation measures and action plan to Council (March 2017)



Process and Timelines





Community Advisory Group

- 17 to 21 members from flood-affected communities, businesses, watershed groups, as well as non-flood affected Calgarians.
- This is a reflection of the values and perspectives across Calgary not a technical group or decision-making body
- Provide feedback into criteria for our TBL analysis of flood mitigation options
- Provide input on the broader community engagement
- Review mitigation options including input into Bow River Working Group (if and when required), examine trade-offs, improve recommendations
- Act as a liaison to respective stakeholder groups



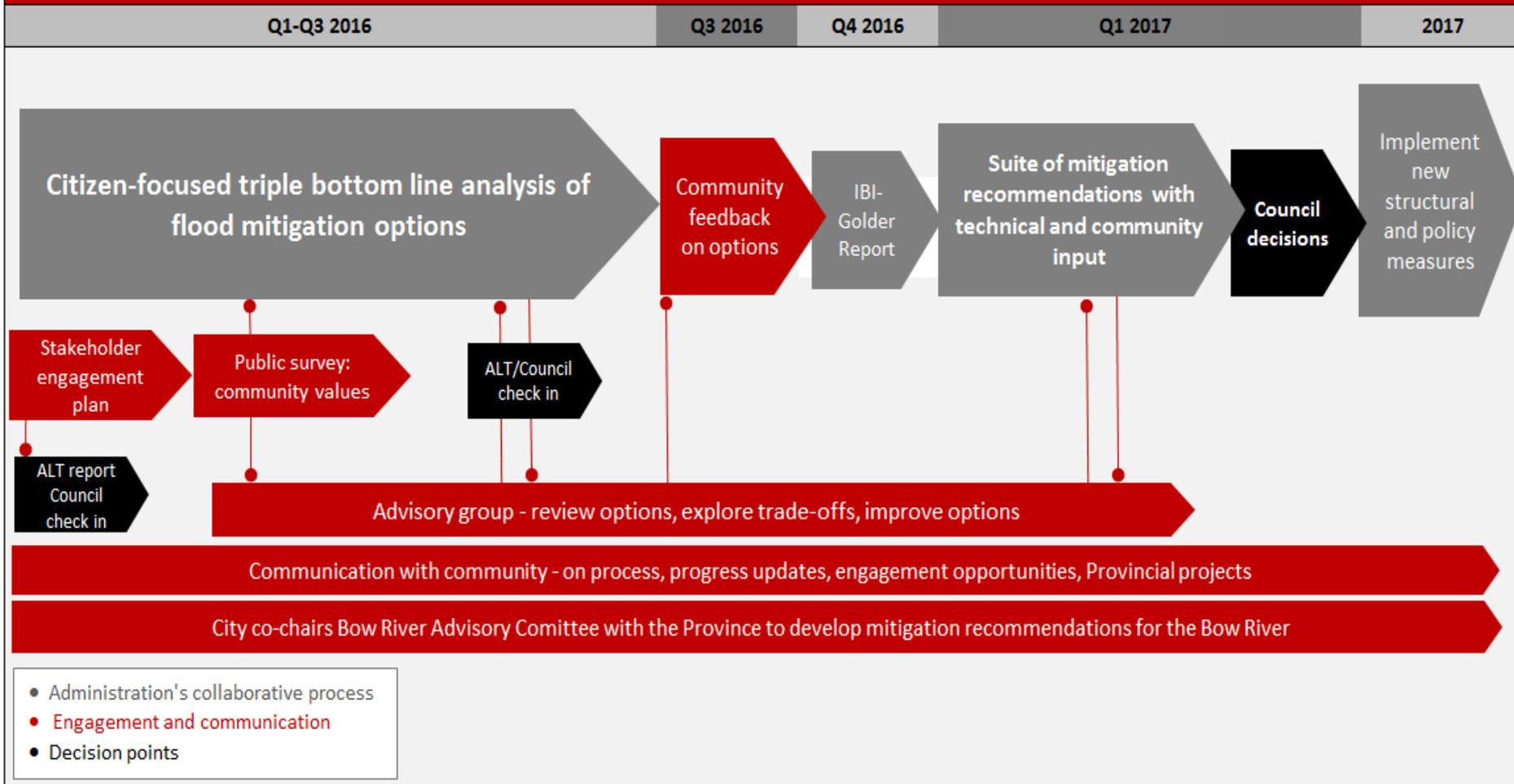
Key messages

- Flood resiliency is a complex and long-term process. We each have a role in making Calgary more flood resilient.
- Inform citizens of the mitigation measures are being considered and why in a transparent way.
- We will ask for input on mitigation measures from all flood affected communities, as well as the Community Advisory Group and the general public.
- We will use this feedback to make the best decisions for Calgary.



Roadmap to building community resiliency

Flood Mitigation Options Assessment





LAND USE PLANNING, POLICIES, BYLAWS



Strengthening Flood-Related Policies

- Expand the review of the Land Use Bylaw and other developmental regulation to update flood resiliency requirements for private property in flood risk areas
- Review The City's existing land-use planning documents and develop amendments, new guidelines or policies that will minimize development in the floodplain over time.
- Perform a social, economic, and environmental analysis to evaluate the need for a minimum flood protection level above the 1:100 flood for land-use planning and structural protection across Calgary



- Revised by Council in 2014 to provide high level guidance for planning and development decisions
- Priority over public good over private interests with emphasis on safety and reducing property damage
- Works in conjunction with land use bylaw to regulate development



Land Use Bylaw changes for Flood Hazard Areas

- Removed “grandfathering” clauses that did not require certain redevelopment from meeting the current bylaw rules
- Made all uses in the floodway discretionary rather than permitted
- Created a sliding scale approach for resiliency measures in buildings based on the extent of redevelopment/renovation



TECHNICAL OVERVIEW

WHAT IS THE GOAL OF MITIGATION?

There may be many goals, including:

- **Protect public safety and property**
- **Reduce damages**

How do we do that?

Either:

- **Keep the water out**
- **Keep property out of the water**



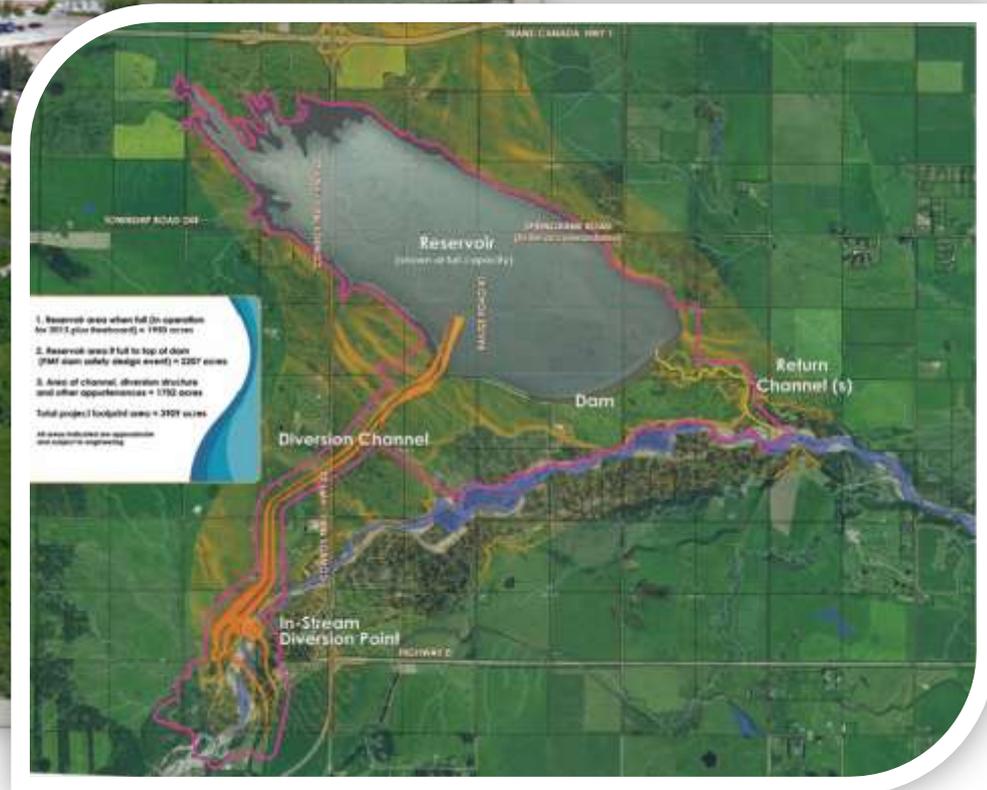
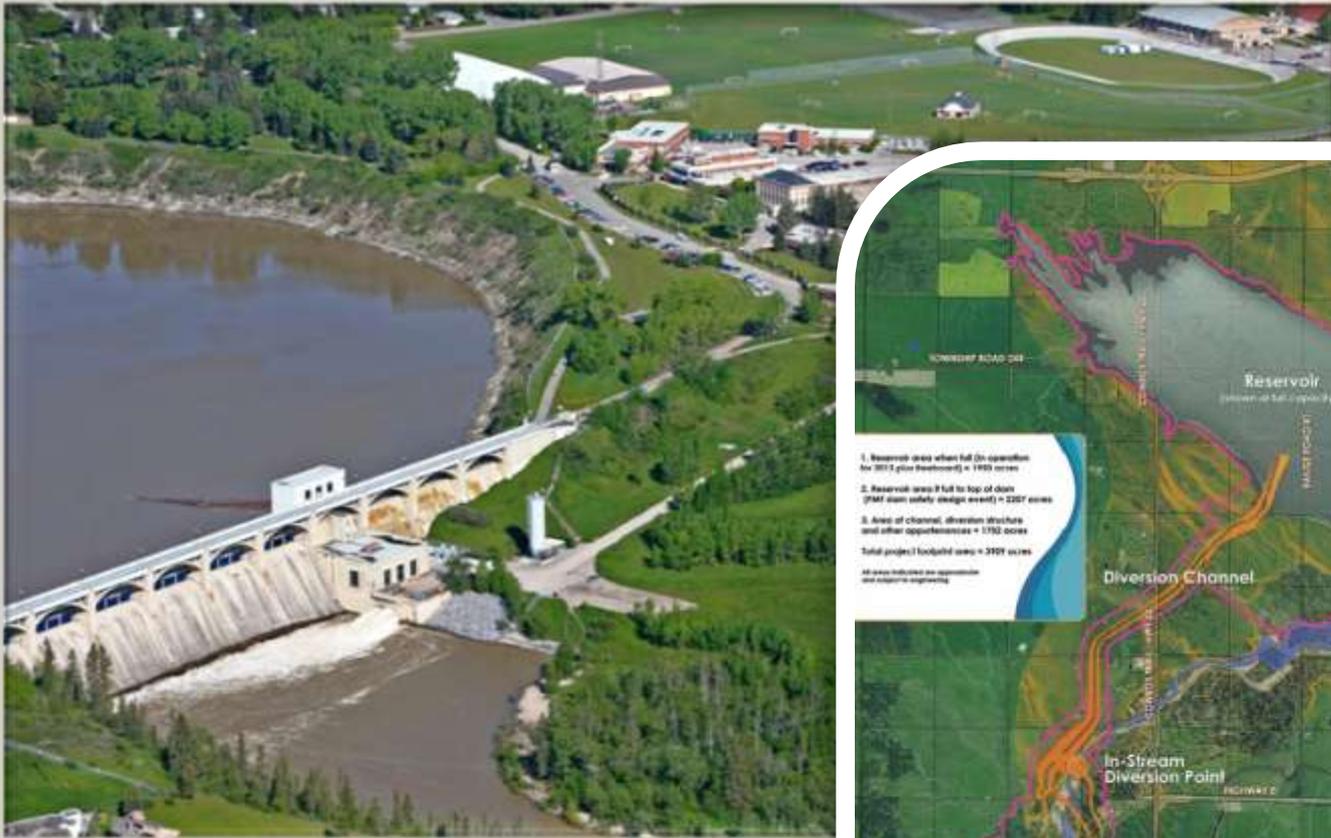
Flood Mitigation Measures Assessment:

“Long List” of Flood Mitigation Measures includes:

***Note: inclusion on this list does not indicate implementation**

- Reservoirs – improve operations of existing, or build new
- Barriers (or “berms” or “dykes”)
- Removing buildings or land use types from floodplain
- Improving bank stability
- Increasing capacity of river channels
- Healthy riparian areas / natural attenuation
- Diversion
- Policy, land use bylaw, permitting – e.g., building elevations, set-backs, no basements/lower suites?
- Improved forecasting and response
- Insurance

Reservoirs



Barriers



(Dave Martin/A

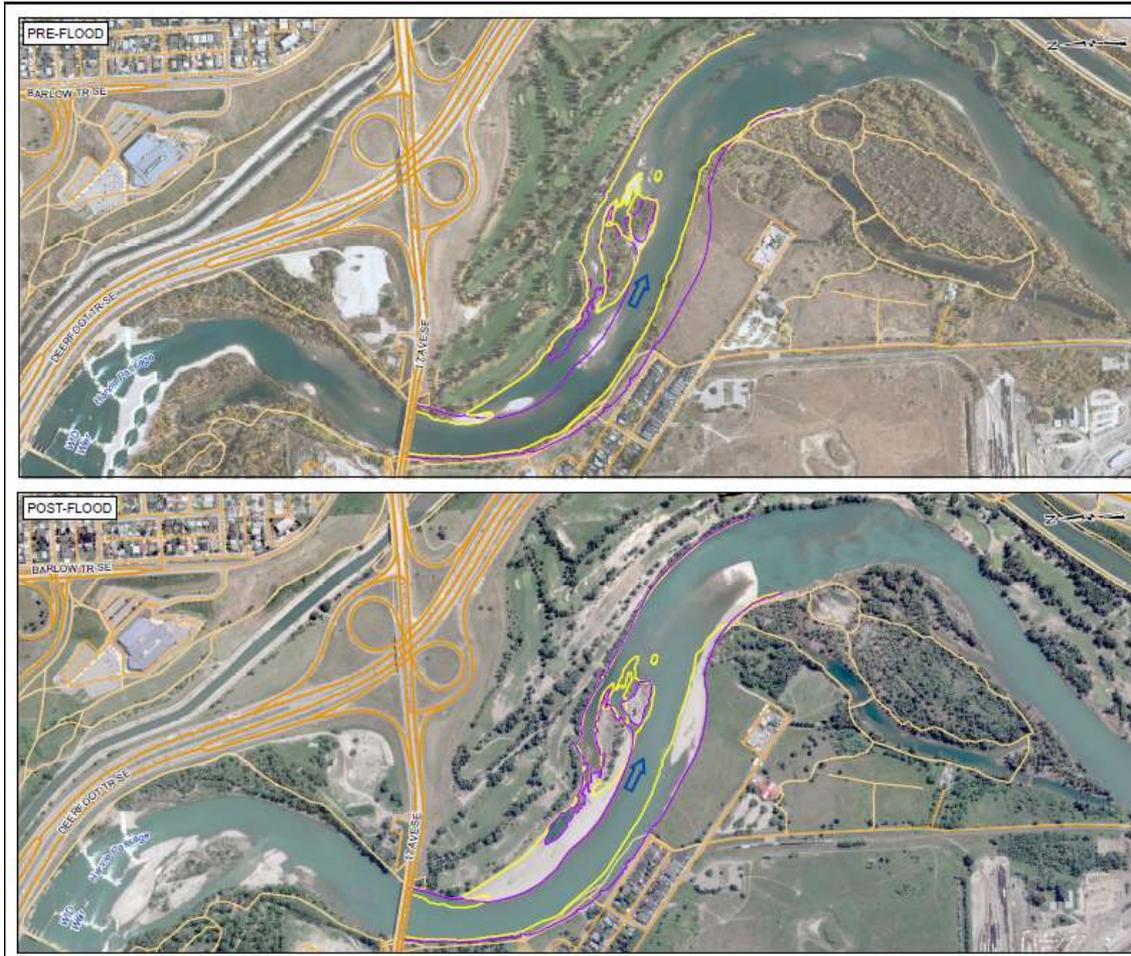
Barriers



Bank Stabilization



Increasing capacity of river channel



Healthy Riparian Areas and Natural Attenuation

Intact riparian area on Bow River

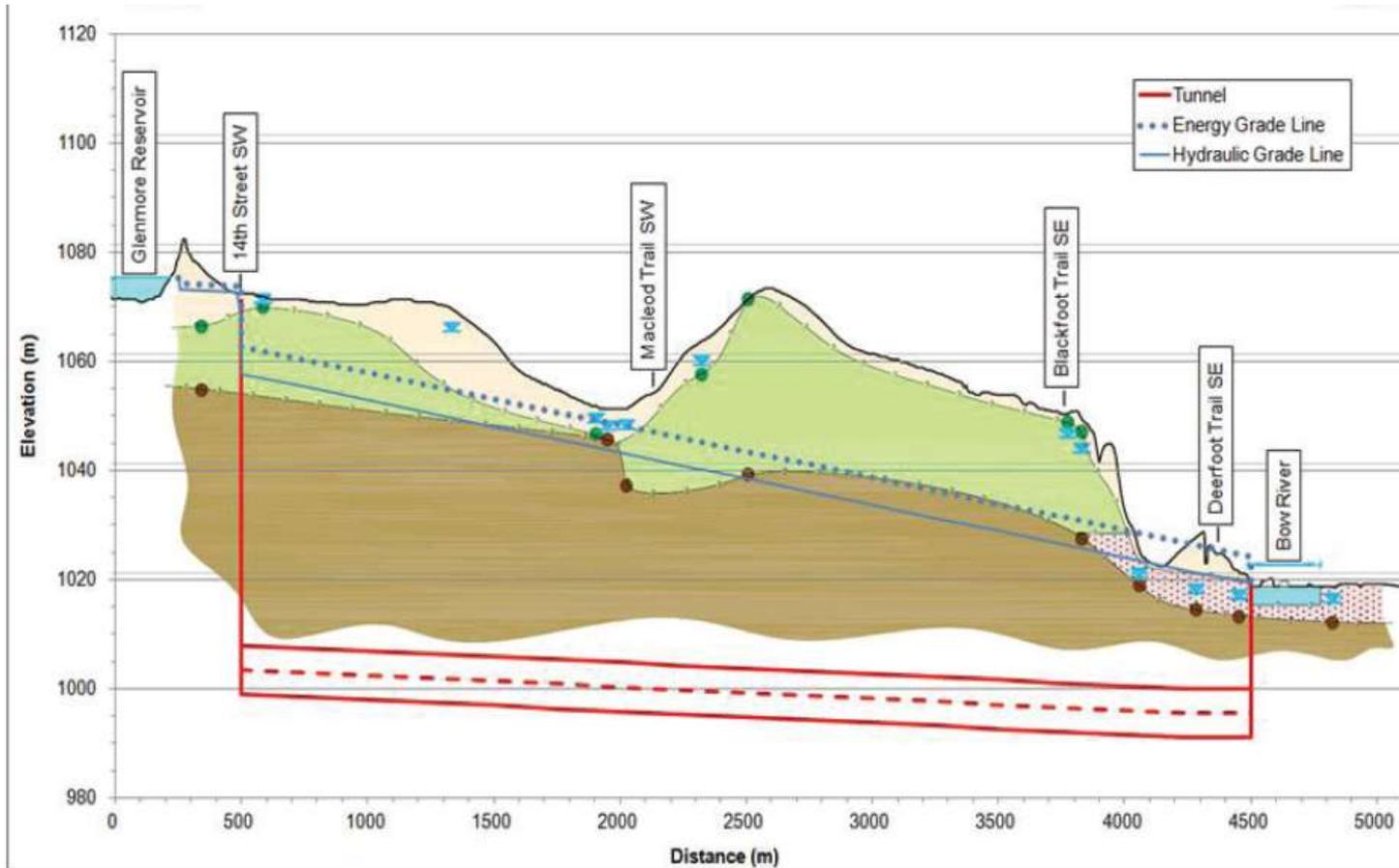


Bank / Riparian Hot Spot on West Nose Creek

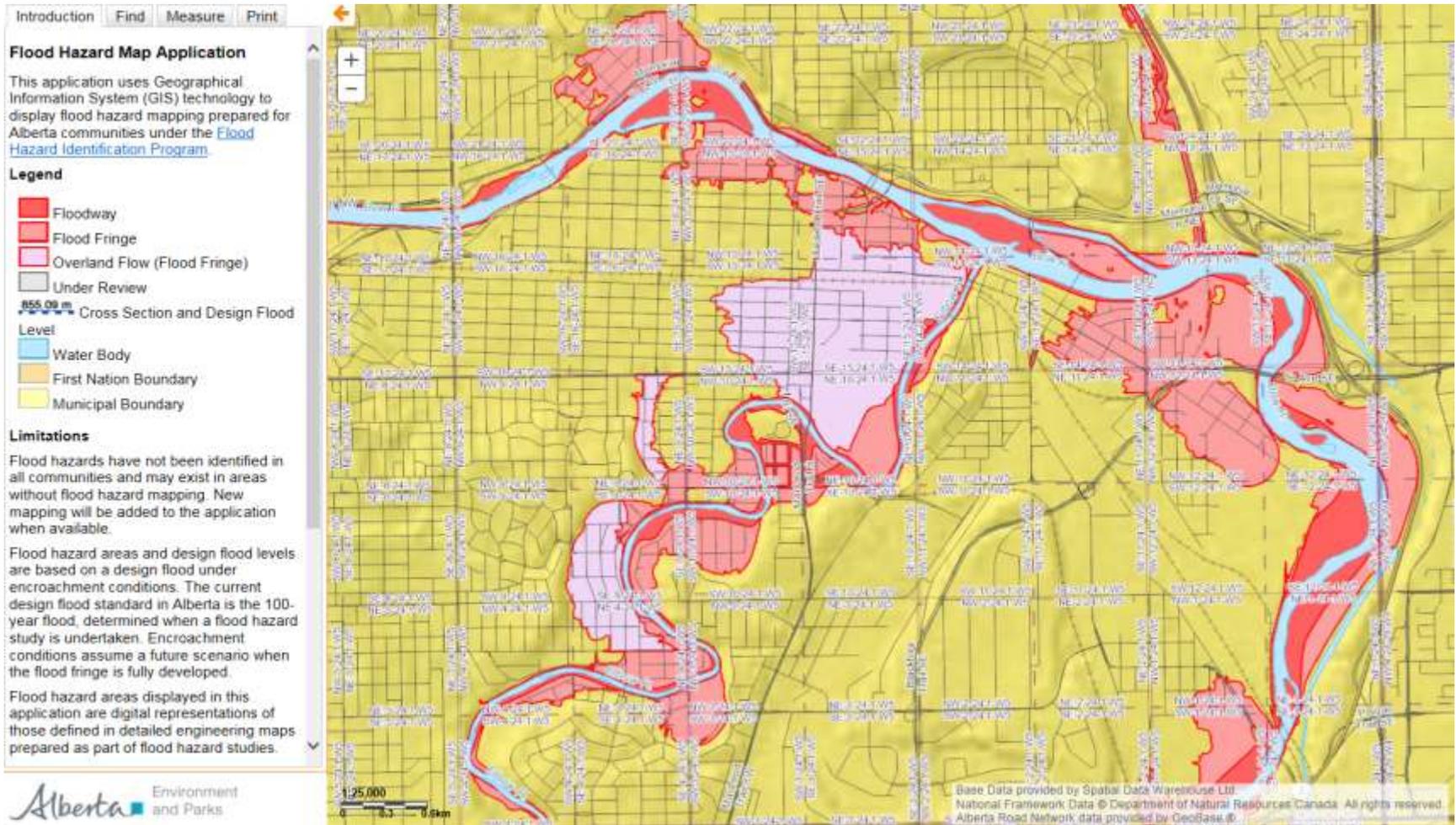




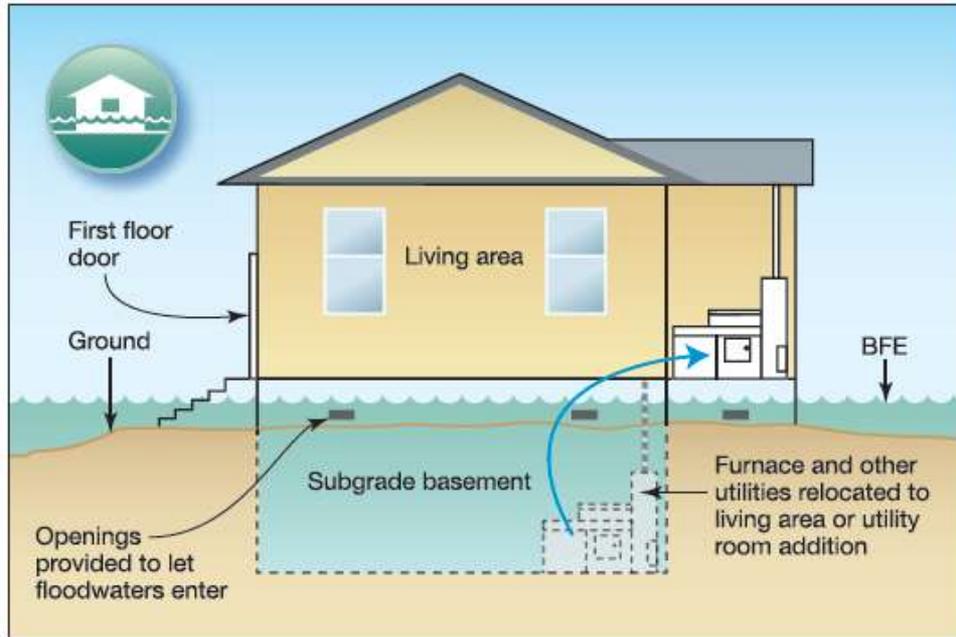
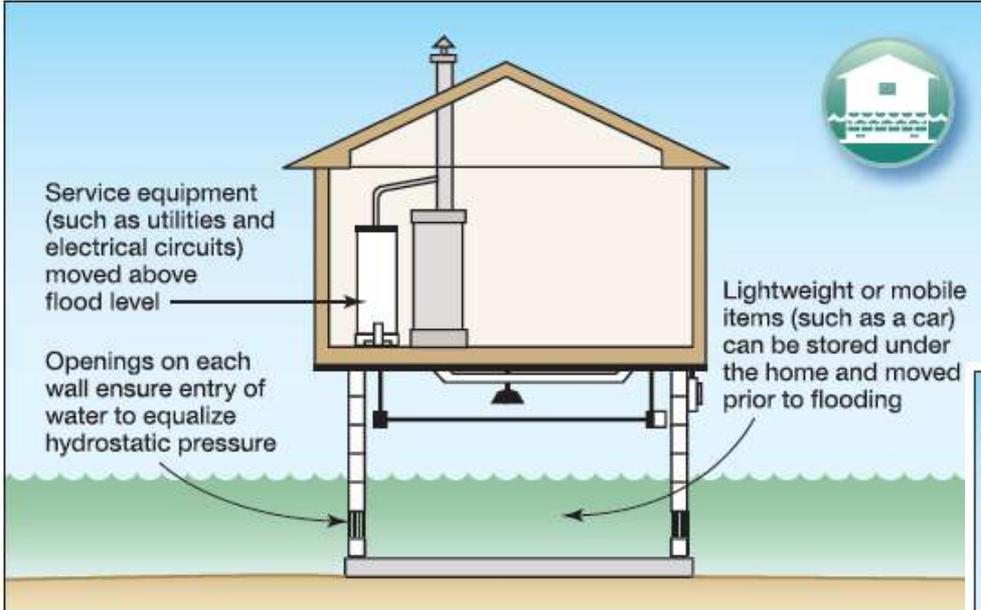
Diversion



Removing buildings or land uses from floodplain or floodway



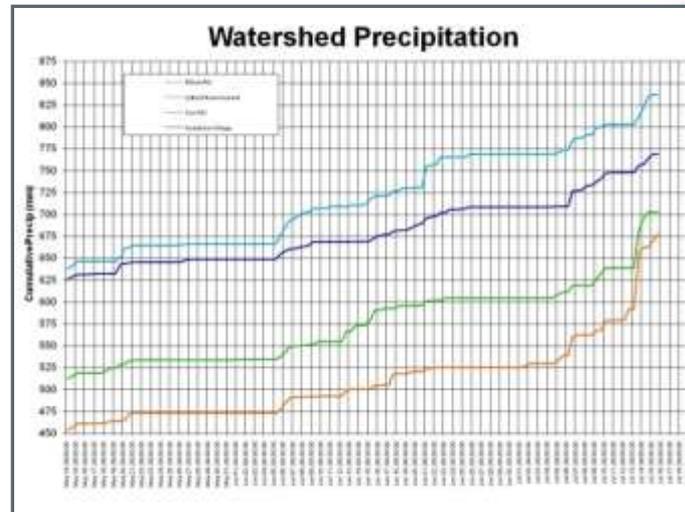
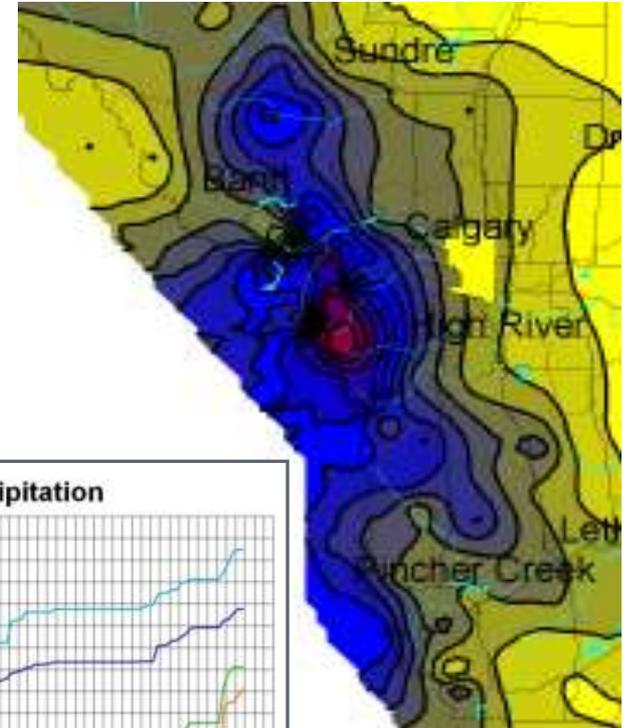
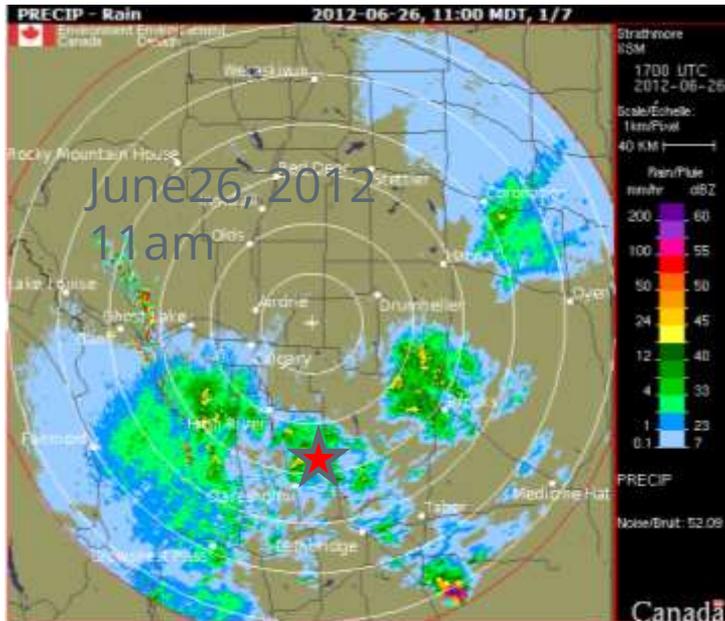
Land Use Policy and Development Permits



Land Use Policy and Development Permits

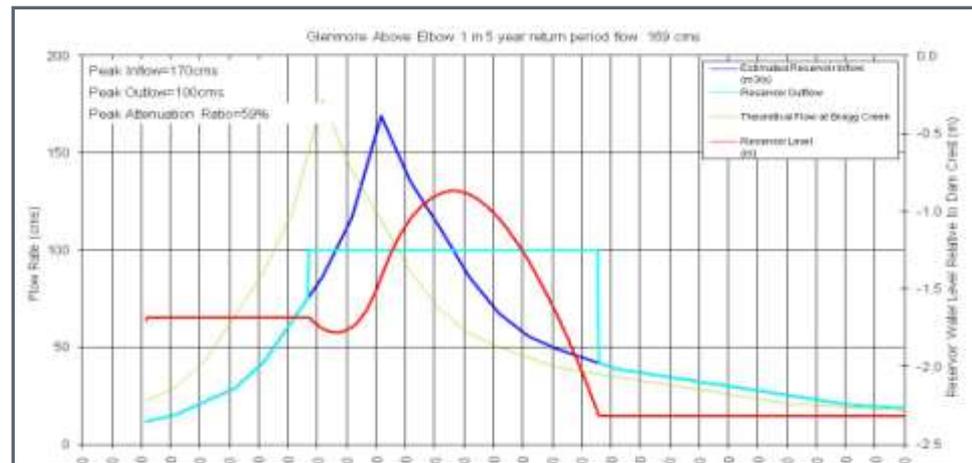
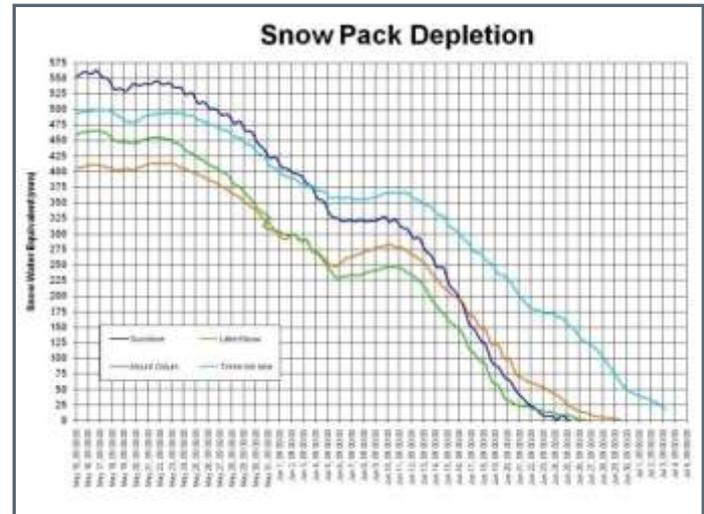
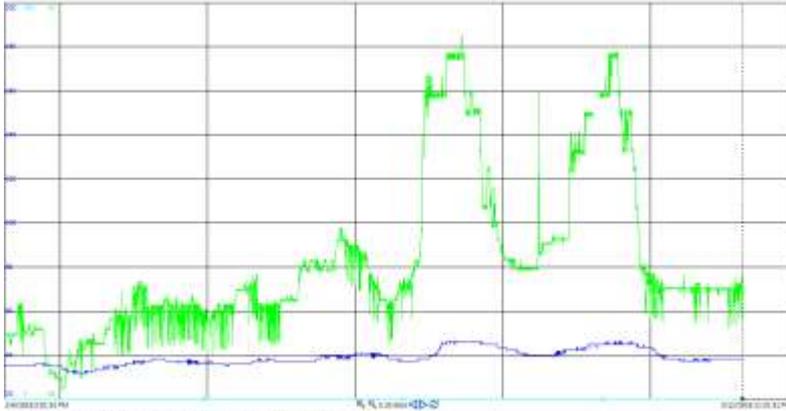


Improved forecasting and response





Improved forecasting and response





Insurance

The screenshot shows the CBC News Calgary website interface. At the top, there is a navigation bar with categories: TV, RADIO, NEWS, SPORTS, MUSIC, ARTS, LOCAL, and MORE. To the right are buttons for WATCH, LISTEN, LOG IN, and a search bar labeled SEARCH CBC.ca... Below this is a banner for CBCnews | Calgary featuring a row of six news anchors. A live stream widget on the right shows 'LIVE Calgary More Streams' with 'The Homestretch' and a 'Listen Live' button. A secondary navigation bar includes Home, World, Canada, Politics, Business, Health, Arts & Entertainment, Technology & Science, Trending, and Video. Below this, 'Canada' and 'Calgary' are highlighted, with a link to 'Photo Galleries'. The main headline reads 'EXCLUSIVE | Overland flood insurance available in Calgary'. A sub-headline states 'Insurance covers damage caused by water entering a home through doors, windows'. At the bottom, it says 'By Carla Beynon, CBC News | Posted: Jun 05, 2014 11:09 AM MT | Last Updated: Jun 05, 2014 9:10 PM MT'.



Mitigation Planning and Implementation:

Taking the time to make sure we do the right things, do things right, and end up with holistic and sustainable solutions



Completing “no-regrets” or “slam-dunk” projects that will have benefit no matter what else gets done, as we get funding