



# DRUMHELLER FLOOD MITIGATION AND CLIMATE ADAPTATION SYSTEM

## CHANGING THE CHANNEL ON FLOOD READINESS



### WE ARE A FLOOD COMMUNITY

The story of Drumheller is one of changing climate. It started under a layer of ice which melted to reveal a treasure trove of fossils deposited by the mass extinction of the dinosaurs. As the melting water sliced deep through the Great Plains, it eroded 75 million years of geological layers and created the Canadian Badlands. Of a population of 8,000 there are 2,344 residents in 1,045 dwellings at risk of direct inundation in a 1% return flood event.

Drumheller is the 3rd largest tourist destination in Alberta, but has seen its fair share of adversity from mother nature in terms of flooding:

- June 27, 1915 (rain on snowmelt)
- April 2, 1967 (ice jam)
- June 18 1931 (rain on snowmelt)
- June 23, 2005 (rain on snowmelt)
- April 21, 1948 (ice jam)
- June 21, 2013 (rain on snowmelt)
- August 26, 1954 (rainfall)
- April 24, 2018 (ice jam)

The Drumheller Flood Mitigation and Climate Adaptation System (DFMCAS) is a multi-hazard solution covering 100 kilometers of riverbank, that has been designed to reduce flooding and protect Drumheller into the 22nd Century. It began in April 2019 and will end March 2024.



### FOCUS AREAS

#### Communications & Engagement

1. Promote Drumheller's approach to adapting to the perils of changing climate
2. Inform residents on a regular basis on land, engineering and construction phases of the program
3. Continuing to unite the community behind a shared purpose to protect Drumheller's economic, environmental and cultural assets from flooding
4. Consult and engage with impacted indigenous communities
5. Position Drumheller as an innovative leader in the area of flood mitigation and readiness
6. Communicate and work with financial and insurance sectors on viable solutions for displaced homeowners

#### Regulatory & Approvals

1. Obtain transfer of existing dikes from Alberta Environment and Parks (AEP) to Town of Drumheller
2. Meet obligations of funding agreements
3. Collaborate with AEP on revised Flood hazard maps
4. Encourage economic development through updated MDP and LUB by ensuring future development proceed in areas not subject to flood risks

#### Conveyance Capacity

1. Make room for the river – preserve channel capacity informed by engineers and geotechnical analysis
2. Ensure Drumheller is prepared for inevitable flooding events caused by either an ice jam, high flow levels or intensive rainfall
3. Preserve up to 1,200 acres of natural (riparian) area that is comparable to 3,200 family cars of carbon capture per year
4. Develop a fair and balanced land acquisition policy for impacted homeowners

#### Structural Measures

1. Construct an adaptive system to protect the community into the 22nd century
2. Protect the cultural, palaeontological and archaeological treasures of the Red Deer River Valley
3. Develop recreational and educational interpretive centers as part of the improved flood mitigation system
4. Connect the Royal Tyrrell Museum to the Atlas Coal Mine via a 38 kilometre "2100 trail network" as part of the improved flood mitigation system

#### Municipal Emergency Plan (MEP) Enhancement

1. Develop detailed flood mitigation system operations manual to accompany MEP
2. Divide river valley into manageable monitoring sectors that will allow regional partners to respond/assist appropriately to their assigned area of responsibility during emergencies
3. Establish a Flood Mitigation and Climate Adaptation operations center to effectively respond during a flood emergency
4. Implement Incident Command System (ICS) protocols throughout flood mitigation and climate adaptation office to educate staff on processes
5. Conduct annual exercises using ICS

### GOAL

The Town of Drumheller has protected the residents and property from loss or injury related to the perils of floods and changes in climate. The risk to property is reduced, thereby preserving economic viability of the community.

### SUCCESS

- Confidence of residents
- Decreased vulnerability and exposure areas
- Increased economic activity in 5 years
- Increased river capacity
- Improved climate adaptation
- Increased staff capacity to respond to future emergencies

### RISKS

- Increasing likelihood of natural disasters
- Changes to the provincial flood hazard maps
- Project delays due to regulatory & approvals process
- Loss of local human resource expertise
- Ineffective communication and engagement

### ACHIEVEMENTS

- Residents were and continue to be engaged and supportive of flood mitigation and climate adaptation system
- Town of Drumheller enhances relationship with Indigenous communities as a result of consultation process
- Residents agree Town of Drumheller is a flood community
- Residents have increased knowledge about flooding in Drumheller

- All existing provincial dikes are transferred to Town of Drumheller
- Revised provincial flood hazard maps are implemented in collaboration with Town of Drumheller
- Future flood plain development in Drumheller is improved through changes to MDP and LUB
- Support from funding partners is maximized

- Channel capacity in Red Deer River is improved/preserved
- Land Acquisition program is successfully completed to remove structures from floodway
- Innovate environmental initiatives were implemented to preserve riparian areas and urban forests
- Projected green house gas reductions of 3200 cars per year equivalent is met

- Enhanced diking system withstands future flooding by being adaptive to future
- Diking network between Royal Tyrrell Museum and Atlas Coal Mine serves as experiential education system for 500,000 annual visitors
- Majority of projected 20,000 man hours to complete work are hired locally

- Town of Drumheller staff are trained to respond to future flooding
- Regional partners manage prescribed monitoring sectors of the river valley
- MEP is updated and meets Bill 8 requirements