



Climate Adaptation Strategy and Action Plan (CASAP)

FINAL REPORT

MARCH 2024



VISION | A THRIVING, CLIMATE RESILIENT COMMUNITY

EXECUTIVE SUMMARY

The City of Lethbridge (the City) is preparing for impacts of climate change, which are already being experienced across the community. The City's Climate Adaptation Strategy and Action Plan (CASAP) is a strategic approach to identifying the greatest climate risks to the community and the **priority actions to be taken by the City over the next 10 years (2024-2034)**. Some of the action items will require further direction from City Council and funding from operating budgets and/or potential capital improvement plan initiatives.

The CASAP considers impacts to the built, natural, social, and economic systems, which are interconnected, and all play a role in supporting a thriving community. The climate risks that are expected to have the greatest impact on the City and the community are **extreme heat, drought, ecoregion shift, grassfires, and grassfire/wildfire smoke**.

The CASAP was co-developed with City staff, City Council, community organization representatives, and residents. A bottom-up approach was used, including 25 hours of workshops with 74 internal and external stakeholders, as well as input from residents with 1720 comments from surveys and an open house. From a total of 323 potential actions considered, the CASAP includes **33 priority actions** organized into **8 themes**.

The City's Waste & Environment department will coordinate the implementation of the CASAP with individual actions being led by various City departments and supported by external partnerships, where appropriate. City Council will be updated on progress through annual reporting of key indicators and will see actions included in department business plans.

Adapting to climate change will require actions not just by the City, but also by business, industry, and residents. A resident action checklist is provided in Appendix C as a reference for the community in taking collective action where appropriate.

With the CASAP in hand, the City is well prepared to achieve its vision to becoming a thriving, and climate resilient community.

Eight Themes

-  **1 Enabling Initiatives**
-  **2 City Emergency Preparedness Planning**
-  **3 Healthy, Safe, and Prepared Communities**
-  **4 Protecting Critical Infrastructure**
-  **5 Resilient Design**
-  **6 Water Stewardship**
-  **7 Transitioning Landscapes**
-  **8 Protecting and Enhancing Nature**

LAND ACKNOWLEDGMENT

For many generations, the place we now call Lethbridge had another name given by the Siksikaititapi, the Blackfoot Peoples. This name, Sikóóhkotok, is a reference to the black rocks found in the area.

The City of Lethbridge acknowledges that we are gathered on the lands of the Blackfoot people of the Canadian Plains and pays respect to the Blackfoot people past, present and future while recognizing and respecting their cultural heritage, beliefs and relationship to the land. The City of Lethbridge is also home to the Metis Nation of Alberta, Region III.

As we work towards a climate resilient future, we must empower and support Indigenous knowledge and ways-of-knowing. Indigenous knowledge is intrinsically and spiritually tied to the natural environment; therefore, Indigenous knowledge is crucial to build a community adapted to projected climate conditions.



Mayor Blaine Hyggen

MESSAGE FROM THE MAYOR

Being an environmentally responsible city is a priority for our organization and community. As a municipality, we have a unique role to play in addressing climate change realities as we have the opportunity to adapt our assets, infrastructure, services, and operations to help build community resilience.

Resilience is more than just responding to emergencies; it describes the ability of our residents, infrastructure, and environment to anticipate, absorb, recover, and adapt to climate impacts. There is an opportunity to protect our city's people, culture, infrastructure, and ecosystem by integrating climate adaptation into the fabric of our organization.

We have demonstrated leadership through emergency planning, weatherproofing our water and wastewater treatment plants from flooding, and expanding our active transportation network. We have also committed to diverting waste from our landfill and protecting the natural areas within the City. These examples all support our commitment to being an environmentally responsible city, but there is still work to be done.

The City of Lethbridge Climate Adaptation Strategy and Action Plan (CASAP) provides a framework and approach for the City to take to decrease the risk of climate impacts to our community. In recent years, we have experienced flooding, hail, extreme heat and cold conditions, and prolonged drought. These extreme weather and climate events impact our homes, businesses, infrastructure, and residents. City Council is committed to building climate resilience in our community by proactively preparing for future climate events and the CASAP is a step in the right direction.

We must take a leadership role in preparing for climate risks by doing what we can to minimize the negative effects of climate change. We must also continue to progress and bolster the incredible work that is already being done in the City. This plan will help our community withstand the impacts of climate change and will have a positive impact to our social, economic, and environmental systems.

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GLOSSARY

Term	Definition
Acute Risks	Rapid onset or event-driven risks such as high wind or intense rainfall events.
Adaptation (to climate change)	Adjusting to actual or expected climate impacts to reduce negative effects on people, society, infrastructure, and the environment.
Chronic Risks	Slow onset risks and long-term shifts in climate patterns such as seasonal temperatures and precipitation changes, or species migration.
Climate	The weather of a specific region averaged over a period of time, typically 30 year periods.
Climate Change	Significant changes in global temperature, precipitation, wind patterns and other measures of climate that occur over several decades or longer.
Climate Hazard	A special type of hazard that is (at least partially) caused by climatic drivers, e.g. urban flooding.
Consequence	The result or effect from climate impacts to people, society, infrastructure or the environment.
Equity	Equity denotes fairness and justice in process and in results. Equitable outcomes often require differential treatment and resource redistribution to achieve a level playing field among all individuals and communities.
Extreme Weather Event	A meteorological event that is rare at a place and time of year, such as an intense storm, flood or heat wave that is beyond the normal range of activity.
Greenhouse Gas (GHG)	A gas that absorbs and emits radiant energy causing the greenhouse effect, which warms the atmosphere and changes the climate. The primary greenhouse gases are water vapour, carbon dioxide, methane, nitrous oxides, and ozone.

Term	Definition
Hazard	A potential source of harm.
Impact	An estimate of the harm that could be caused by an event or hazard.
Likelihood	The probability or chance of a hazard occurring, and how this likelihood changes in the future due to climate change.
Mitigation (of climate change)	Human interventions to reduce the sources and enhance the sinks, or absorption, of GHGs.
Representative Concentration Pathway (RCP)	RCPs represent how concentrations of GHGs in the atmosphere will change in the future because of human activities. There are four RCPs (2.6, 4.5, 6.0 and 8.5) with a higher value representing higher GHG concentrations.
Resilience	The capacity of a system or community to minimize damage and recover from hazards.
Risk	A combination of the likelihood and consequences of an adverse event or condition occurring.
Stakeholder	People who are, or perceive themselves to be, affected by a decision, strategy, or process. A stakeholder can be an individual, an organization or a group within an organization. Stakeholders can change at different stages in a process.
Vulnerability	Derived from the interplay of the degree that people, assets, and other economic, social, and cultural resources are affected by a climate hazard (positively or negatively), ability to cope or withstand an impact, and existing non-climate stresses or pressures.
Weather	Short term day-to-day changes in atmospheric conditions like temperature and precipitation.

LIST OF ABBREVIATIONS

Acronym	Community Organization
ALIDP	Alberta Low Impact Development Project
BILD	Building Industry and Land Development Association
CFIA	Canada Food Inspection Agency
C&F	Cows and Fish Community Organization
EL	Environment Lethbridge
KEPA	Kainai Ecosystem Protection Association
OWC	Oldman Watershed Council
SAEA	Southern Alberta Ethnic Association
SAGE	Southern Alberta Group for the Environment
SCP	SAGE Clan Patrol
STOPDED	Society to Prevent Dutch Elm Disease
SZ AHS	South Zone, Alberta Health Services

Acronym	Technical Terms or Initiatives
CASAP	Climate Adaptation Strategy and Action Plan (this document)
CEIP	Clean Energy Improvement Program
GDP	Gross-Domestic Product
HIRA	Hazard Identification & Risk Assessment
IDF	Intensity-Duration-Frequency
IPM	Integrated Pest Management
LEED	Leadership in Energy and Environmental Design
LID	Low Impact Development (land use and engineering design to manage stormwater runoff through green infrastructure)
MDP	Municipal Development Plan
MCCAC	Municipal Climate Change Action Centre
O&M	Operations and Maintenance

Acronym	City Department/Group
C&E	Communications & Engagement
CSD	Community and Social Development
DEM	Director of Emergency Management
Electric	Electric Utility
EP	Emergency Planning
Facilities	Facility Services
Fleet	Fleet Services
HSNC	Helen Schuler Nature Centre
Legal	Legal Services
LFES	Lethbridge Fire and Emergency Services
LPS	Lethbridge Police Services
OL	Opportunity Lethbridge
P&D	Planning & Design
Parks	Parks & Cemeteries
PS	Partner Services
R&C	Recreation & Culture
SHW	Safety, Health & Wellness
TFS	Treasury and Financial Services
TR	Transportation
Transit	Transit
UC	Urban Construction
W&E	Waste & Environment
W/WW/SW	Water/Wastewater/Stormwater
311	Customer Service & 311

ACKNOWLEDGMENTS

The Lethbridge Climate Adaptation Strategy and Action Plan (CASAP) was developed with the input and hard work of a diverse group of individuals and organizations. We appreciate the time, effort, and knowledge contributed to building a more resilient city.

Funding was generously provided by the Municipal Climate Change Action Centre (MCCAC), a partnership of Alberta Municipalities and Rural Municipalities of Alberta.

We would like to acknowledge the following City of Lethbridge department stakeholders that supported the development of the CASAP:

- Airport
- Communications & Engagement
- Community and Social Development
- Electric Utility
- Emergency Planning
- Facility Services
- Fleet Services
- Helen Schuler Nature Centre
- Indigenous Relations
- Lethbridge Fire and Emergency Services
- Opportunity Lethbridge
- Parks and Cemeteries
- Partner Services
- Planning & Design
- Risk and Controls
- Transportation
- Treasury and Financial Services
- Waste & Environment
- Water, Wastewater, Stormwater
- Transit

We would like to acknowledge the following community stakeholders that supported the development of the Lethbridge CASAP through workshop participation.

- Alberta Health Services
- Building Industry and Land Development Association
- Downtown BRZ
- Economic Development Lethbridge
- Environment Lethbridge
- Green Acres Foundation
- Lethbridge College
- Lethbridge Construction Association
- Lethbridge Family Centre
- Lethbridge Housing Authority
- Lethbridge Senior Citizens Organization
- Oldman Watershed Council
- Southern Alberta Group for the Environment
- Tourism Lethbridge
- University of Lethbridge Postdoctoral Fellow
- University of Lethbridge Students' Union

Please refer to [Appendix A](#) for a full list of participants. For additional details please refer to the CASAP Engagement Report.



Municipal
Climate Change
Action Centre



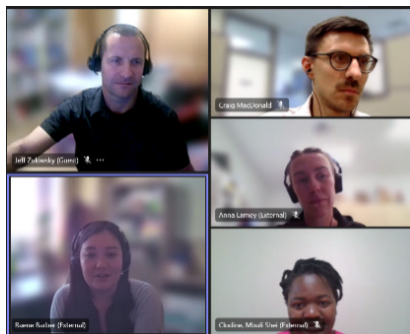
“We, as human beings, all have a duty to take care of the land, the water, nature, and all species. We are all stewards of the earth. It is our utmost duty because we only have one earth. One water. And one time.”

- Dr. Mike Bruised Head, KEPA

Diverse Perspectives

The City of Lethbridge prioritized input from a broad and diverse range of perspectives in developing the CASAP. Different methods were used including:

- A series of workshops with stakeholders from across City departments (internal) as well as community organizations (external). These workshops were a mix of in-person and virtual.
- Open forums for public input were provided on Get Involved Lethbridge as well as an in-person Community Conversation event.



9 workshops 

74 stakeholders 
52 CITY | 22 EXTERNAL

660

hours of participant time spent in workshops 

258 public survey responses on public actions

169 public comments on Vision and Principles

1720 stakeholder comments



items scored / voted on 323
210 COMMUNITY | 113 CITY

357 residents attended Community Conservations event 

INTRODUCTION

Climate change is a risk multiplier, meaning that we are already experiencing many climate-related hazards, but they will become more frequent and more severe. Drought is the most top-of-mind climate hazard for many people in Lethbridge. However, many other climate hazards have also been recently experienced including high winds (2023), extreme heat (2022), and severe storms (2022).

Considering the escalating risks climate hazards pose to Lethbridge, this Climate Adaptation Strategy and Action Plan (CASAP) outlines priority actions to be taken by the City of Lethbridge (the City) over the next 10 years to prepare for a changing climate and to build community resilience. Some of the action items will require further direction from City Council and funding from operating budgets and/or potential capital improvement plan initiatives.

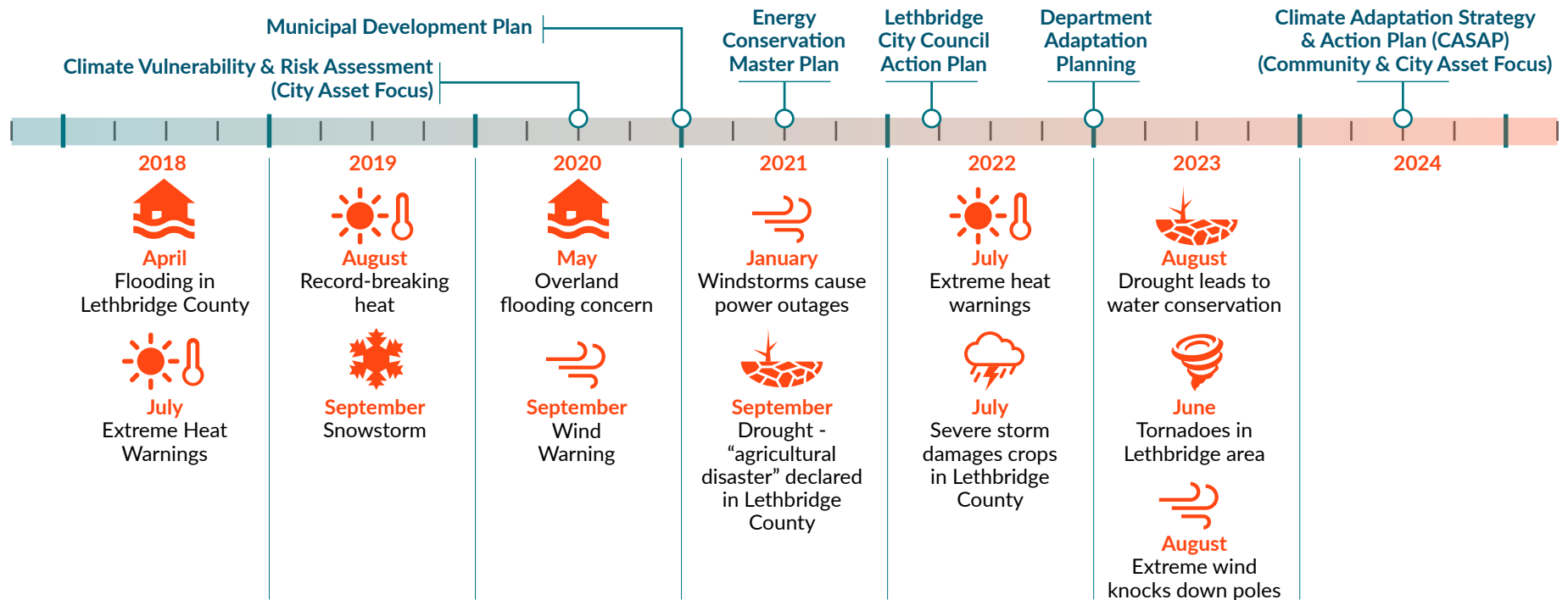
The CASAP is not the City's first initiative related to climate change. Several City plans and programs currently consider climate change, including high-level policy in the Municipal Development Plan (MDP).

Climate action including adaptation (preparing for changing climate) and mitigation (reducing energy and greenhouse gases) has been progressing at the City over the last few years.

The timeline below maps out key City initiatives as well as extreme weather events in the region that demonstrate the urgency of adapting to climate change. The CASAP draws on these insights to ensure that the plan is relevant to Lethbridge's unique context.

Climate adaptation requires collaboration between municipal departments, community and Indigenous organizations and residents. Many opportunities for partnerships and actions were identified in the creation of this plan. By working together and leveraging existing knowledge, existing initiatives can be enhanced and new adaptation strategies initiated.

Timeline of Lethbridge's Climate Adaptation Initiatives and Recent Climate Events



VISION AND PRINCIPLES

The following vision statement and principles inform the City of Lethbridge's CASAP. They were developed by City stakeholders (see Acknowledgements section) and refined based on input from the Assets and Infrastructure Standing Policy Committee of City Council and public survey input.

The vision defines the desired long-term state of the community as the climate changes. Each of the principles are critical for achieving success for the long-term vision to become a reality. It is vital that the City regularly refers to these principles and adjusts, where necessary, for effective climate adaptation decision making.



Vision

A thriving, climate resilient community.



Safe & Secure

Protect wellbeing of people, the environment, infrastructure, and local economy.



Sustainable & Reliable

Durable, diversified, and adaptable infrastructure and programs to consistently provide basic needs and services.



Trust

Effective, transparent, and accessible communication people can trust.



Community Support Networks

Strengthen self reliance & collective action in response to climate impacts.



Affordable, Fair Access for All

Ensure the most vulnerable are not left behind.



Accountable

Embed climate considerations in City decisions.



Leadership

Provide direction, advocacy, and support for local and regional climate action.

SCOPE AND ASSESSMENT BOUNDARIES

For practical reasons (in terms of what the City can control and influence) the following scope and assessment boundaries were used to develop the CASAP:

Spatial Boundary:

Impacts within City of Lethbridge's boundaries. However, the important connection to regional ecological and economic systems was recognized.

Climate Impacts:

Chronic (slow onset) and acute (rapid onset) climate impacts.

Types of Impacts:

A systems-based approach considering the interaction between the built, natural, social, and economic systems and their impacts on the community.



Assessment Timeframe:

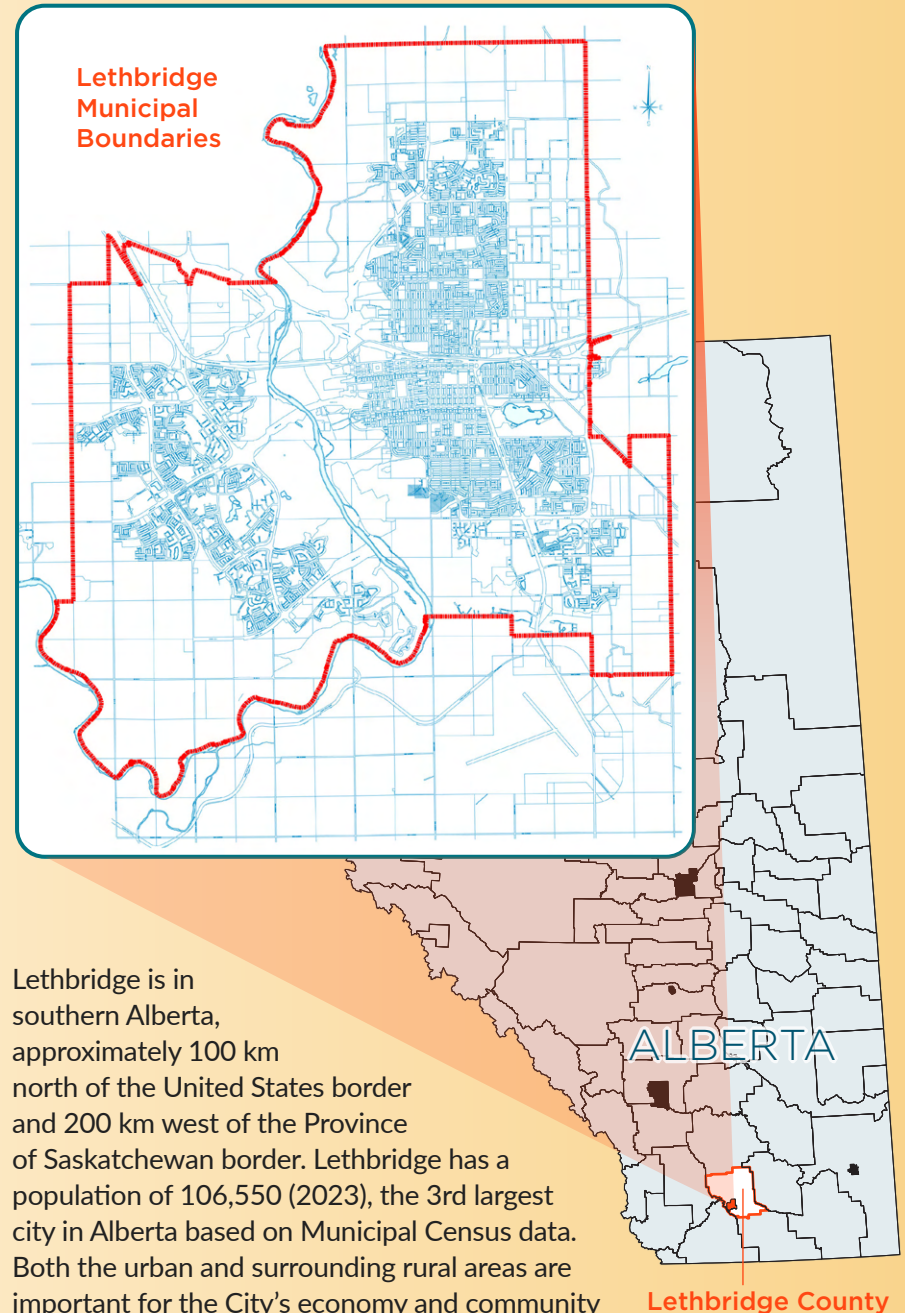
Climate risks anticipated based on climate projections in 2051-2080.

Climate Scenario:

Climate projections using a high emissions scenario (i.e., limited climate policy) with a representative concentration pathway (RCP) of 8.5.

Action Timeframe:

Actions that can be implemented over the next ten years by the City of Lethbridge.



Lethbridge is in southern Alberta, approximately 100 km north of the United States border and 200 km west of the Province of Saskatchewan border. Lethbridge has a population of 106,550 (2023), the 3rd largest city in Alberta based on Municipal Census data. Both the urban and surrounding rural areas are important for the City's economy and community perspectives.

UNDERSTANDING CLIMATE CHANGE

Climate Mitigation

Climate mitigation refers to technologies and actions that reduce climate change causing greenhouse gas emissions (GHG). The more GHGs that are released, the hotter our planet gets. The City has an Energy Conservation Master Plan (2021) that identifies priority areas for the City to reduce energy consumption and associated GHGs. The City tracks and reports GHGs through the Partners for Climate Protection program.

Example climate mitigation actions: renewable energy, energy efficiency, natural or engineered wetlands, active transportation

Connection to Extreme Events

For every 1°C increase in temperature, the atmosphere holds 7% more water vapour. A warmer atmosphere can also hold the water vapour longer. This is why periods of drought with longer, hotter, drier summers can be expected, but when it does rain, it will fall with more intensity.

The more GHG emissions are reduced, the less severe future climate change impacts will be.

Climate Adaptation

Climate adaptation consists of the plans and investments made to reduce the impacts of climate change. These can include policy and behavioural changes, as well as modifications to the built environment.

Example adaptation actions: flood protection, infrastructure upgrades, healthy tree canopy, native or drought-tolerant vegetation, disaster management.



Weather

Short term day-to-day changes in atmospheric conditions like temperature and precipitation.



Climate

The weather of a specific region averaged over a long period of time, typically 30-year periods.



Climate Change

Significant changes in climate that occur over several decades or longer.



Mitigation

Human interventions to reduce the sources and enhance the sinks, or absorption, of GHGs.



Adaptation

Adjusting to actual or expected climate impacts to reduce negative effects on people, society, infrastructure, and the environment.



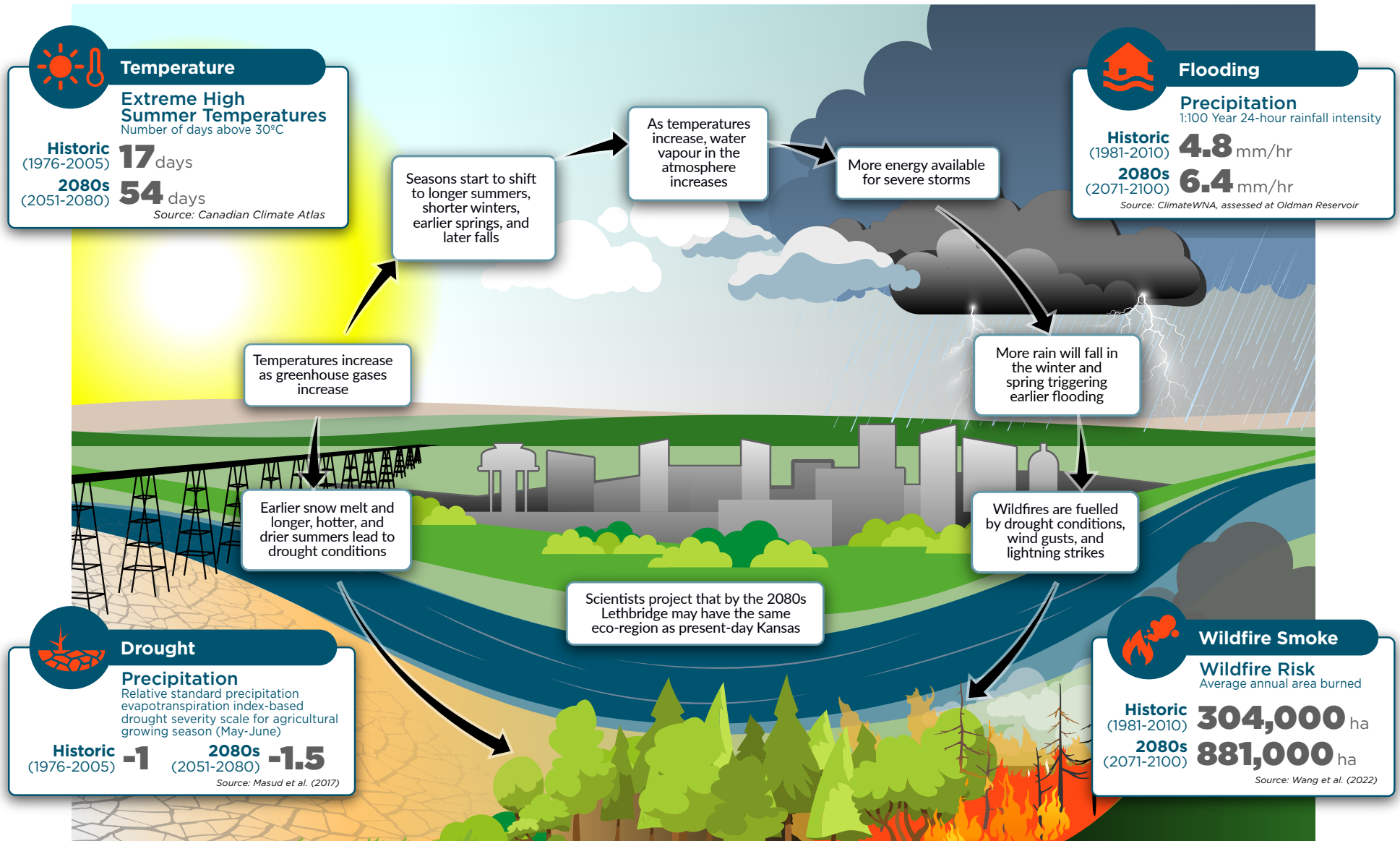
Resilience

The capacity of a system or community to minimize damage and recover from hazards.

CLIMATE PROJECTIONS

Lethbridge residents are already experiencing the impacts of climate change, particularly drought, hotter temperatures, flooding, and wildfire smoke. These hazards will become more frequent and severe between now and the 2080s and will continue to pose risks to the community in the future. Further details on climate projections are available in the [Climate Adaptation Strategy and Action Plan – Risk Assessment Report](#).

Key Climate Projections for Lethbridge



THE COST OF INACTION

The 'cost of inaction' refers to the economic consequences that result from failing to address climate change, which can be reduced by investing in adaptation. These cost estimates help to:

- quantify the scale of the challenge over time,
- inform the distribution of economic impacts across the community,
- support the prioritization of actions targeting the highest risks, and
- justify and inform the level of investment in adaptation.

The total cost of inaction (with all costs measured in GDP) specific for Lethbridge was evaluated using community-specific data. Both **tangible** costs (direct impacts of climate change, such as damage to buildings and infrastructure) and **intangible** costs (impacts to things like ecosystem services, mental health, reduced worker productivity, and loss of life) were included.

Total collective costs of inaction to climate change in Lethbridge include impacts to businesses and organizations, residents, and the City itself. While the City will not bear all these costs alone, the results show an important trend of increasing costs to the community if climate risk is unaddressed.

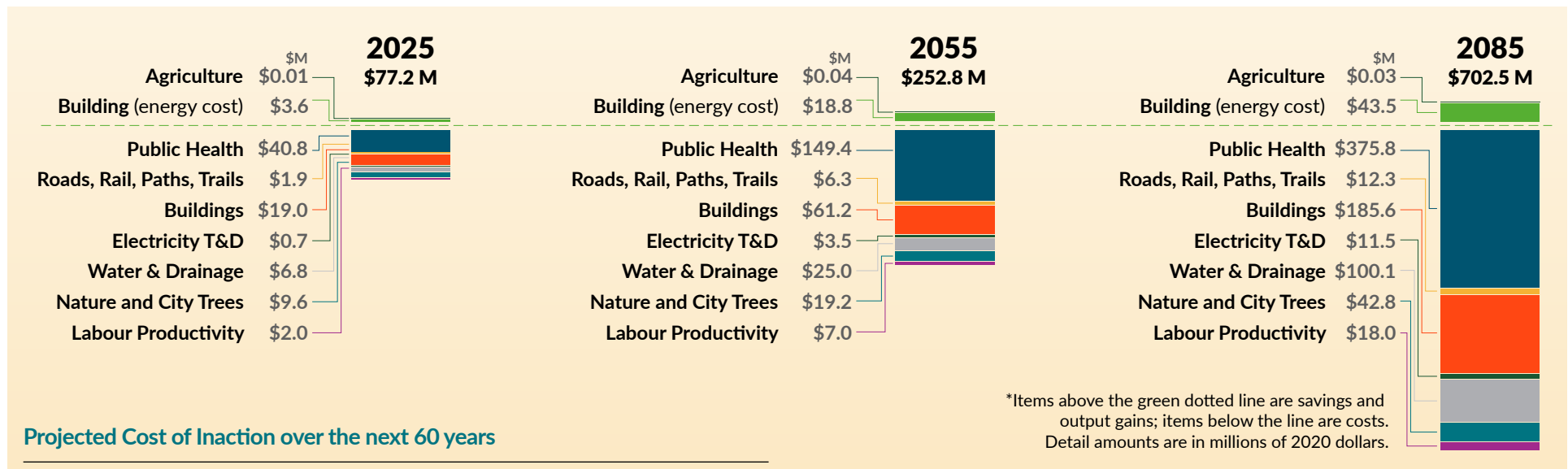
While costs may change over time, there will be increased economic disruption and costs due to climate impacts. Taking action today can reduce future economic burden for the City, businesses, and residents.

The detailed analysis estimates projected costs from physical impacts within Lethbridge's municipal boundary as shown in the figure below. The community is projected to see an annual total cost of climate change of **\$77.2M per year** by 2025 if no adaptation occurs (including public and private costs). These annual costs are anticipated to rise significantly as temperatures warm. Compared with 2025, projected **costs are roughly 3 times higher by 2055 and 9 times higher by 2085.**

The greatest costs will be to the public health and building sectors. While other entities (e.g., Alberta Health Services, private building owners) are directly responsible for responding to many of these impacts, the City has a role to play in community climate adaptation. For example, the City can help reduce the impacts of wildfire smoke on public health by providing publicly accessible spaces with a clean air ventilation and filtration system.

The estimated costs of climate change for Lethbridge are almost certainly larger than the losses presented here. Gaps in our current state of knowledge mean there are limitations in the analysis such as:

- Difficulty accounting for cascading and compounding impacts across different systems.
- Impacts to water resources, tourism, and certain natural assets were excluded due to budget and data constraints.

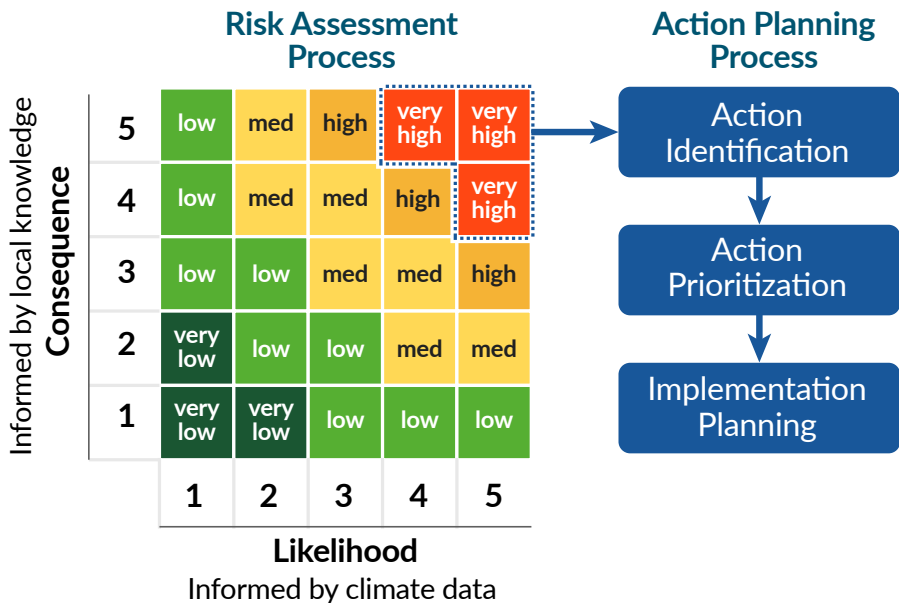


RISK ASSESSMENT

Although there are many impacts from climate change, not all impacts pose the same amount of risk to the community. Climate risk is determined by calculating the **likelihood** of a climate event occurring (frequency) and the **consequence** (severity) of the impact. A climate risk assessment was conducted to identify the greatest risks to the community so that adaptation actions and strategic investments will be focused on these highest risks.

The consequences of the climate impacts were evaluated with input from multiple stakeholders (see Acknowledgement section). The likelihood of the various climate hazards was determined using climate projections data from various public sources, which is summarized in the [Climate Adaptation Strategy and Action Plan – Risk Assessment Report](#).

This CASAP focuses on the “very high risk” hazards to set a manageable number of actions for the City to prioritize its investment and focus over the next 10 years. The risk ranking for Lethbridge’s top increasing climate hazards are as follows:



Very High Risk

- Extreme Heat
- Drought
- Ecoregion Shift
- Grassfires and Grassfire/Wildfire Smoke

High Risk

- Heavy Snow
- Freezing Rain
- Localized & River Flooding

Medium Risk

- Severe Storms (Hail/Lightning)
- High Winds
- Tornadoes

ADAPTATION PLANNING

Prioritization Criteria

BENEFIT
COST

- Effectiveness
- Co-Benefits
- Equity
- Scalability
- Lifecycle total costs
- Negative Side-effects
- Feasibility
- Acceptability

City staff and community stakeholders identified potential adaptation strategies. Participant feedback generated more than 300 adaptation actions, which were prioritized using a multi-criteria approach (see left) and informed by stakeholders' local knowledge and context of existing initiatives. The 33 adaptation actions in this CASAP provide the highest benefits to cost ratio and are grouped into these unifying themes:

- | | | | |
|--|---|--|--|
| | 1 Enabling Initiatives | | 5 Resilient Design |
| | 2 City Emergency Preparedness Planning | | 6 Water Stewardship |
| | 3 Healthy, Safe and Prepared Communities | | 7 Transitioning Landscapes |
| | 4 Protecting Critical Infrastructure | | 8 Protecting and Enhancing Nature |

While Lethbridge's CASAP is unique to the local context, the CASAP themes that emerged are also similar to [Canada's National Adaptation Strategy](#) priority areas. This alignment may be beneficial in the future to align with federal programs and secure funding.

A summary of each theme is provided in the following sections. Each theme section begins with an introduction to explain the context for the actions, followed by a table outlining the actions implementation details.

Monitoring and Reporting

The initial list of indicators and targets should continue to be refined. Each grouping of actions includes:

- Goal:** A longer term objective supported by the action grouping.
- Indicator:** Measurable factors that show progress related to the goal.
- Target:** Provides clarity on what should be achieved.

Action Responsibility

Actions in this plan are the responsibility of municipal staff, however, roles in climate adaptation extend beyond the City. Community connections were identified for potential partnerships, synergies, and alignment with external initiatives.

Workshop participants identified a number of external community organizations which are shown in the CASAP. However, this is not an exhaustive list of potential community connections and other opportunities for collaboration can be explored, as appropriate.

Action Type

The following is a summary of action types.

- **Assessment Actions:** Analysis or research to gather information.
- **Partnership Actions:** New or strengthened existing partnerships.
- **Planning Actions:** New or enhanced plans or strategies.
- **Policy Actions:** New or updated rules, regulations, or guidelines.
- **Procedural Actions:** New or updated operational procedures.
- **Program-Specific Actions:** New or updated program with ongoing implementation.
- **Project-Specific Actions:** New or updated capital projects to be accomplished in one budget cycle.

Public engagement and education are present across many themes and actions. Theme 1: Enabling Initiatives will be important in achieving alignment between stakeholders and public outreach efforts.

Action Timeline (Start Date)

A start date is provided for each action. Some actions have multiple phases, so the timeline provided is to begin the first stage. Actions with multiple phases or with additional budget implications are identified in the implementation tables.

Action Cost

Costs may be captured within existing budgets or require additional funds to be allocated. The costs provided are high level estimates with input from stakeholders.

THEME 1

ENABLING INITIATIVES



Goal Climate adaptation action is coordinated both internal and external to the City.

Indicator # hours of internal climate collaborations per year;
hours of external climate collaborations per year

Target 12 hours internal and 8 hours external, sustained 2026+

Meaningful progress on many adaptation actions will require supporting governance structures, frameworks, and projects to advance implementation across departments and organizations. These “enabling initiatives” help to align the various themes and actions, serving as the foundation for success.

Action must occur in both public and private spheres. Some actions are within the City’s direct control (e.g., improving resilience of City-owned assets) whereas the City will play a role in influencing or supporting external programs or initiatives.

In execution of actions within Theme 1, the City should collaborate with organizations such as:

- Environment Lethbridge
- Oldman Watershed Council
- Lethbridge Construction Association
- BILD
- Cows and Fish
- Local developers and private industry
- Oldman River Regional Services Commission
- Healthy Lethbridge
- Alberta Health Services (south zone)
- Agricultural groups
- Neighbourhood associations
- School boards
- SAEA
- KEPA
- SAGE
- Blood Tribe
- Department of Health
- Alberta Low Impact Development Project
- Red Cross
- Streets Alive Lethbridge
- University/College
- YWCA/YMCA

There is an exciting opportunity to co-develop a Resilient Lethbridge Flagship Project to integrate and align various adaptation actions. The project could allow for stakeholders to collaboratively deploy new technologies and approaches to improve resilience. The Resilient Lethbridge Flagship Project is an opportunity for the City to demonstrate leadership putting resilience into action!

Lethbridge stakeholders have already worked together to test and implement new ideas. The Living Home, designed by Lethbridge College and built by Cedar Ridge Quality Homes in the BuiltGreen Sunridge neighbourhood, informed regionally appropriate building practices and home operation. Lessons learned informed the design of the Helen Schuler Nature Centre. The Living Roof is an educational tool showcasing the native plants of Southern Alberta and design practices that improve the performance of the building.



#	Action	Action Type	Lead	City Support	Community Connections	Cost Estimate	Start
1-1	Develop City of Lethbridge climate adaptation partnerships to implement and inform delivery of the CASAP.	Partnership, (Ongoing)	W&E	All departments	N/A	Internal costs	2024-2026
1-2	Initiate and maintain close working relationships with community and regional organizations to foster collaboration and find synergies between local and regional climate adaptation initiatives.	Program, (Ongoing)	W&E	PS, CSD, EP, LFES	Multiple organizations (specified above)	Internal costs	2024-2026
1-3	Establish a framework and coordinate internal and external delivery of climate change education including climate risks, adaptation actions, and emergency preparedness.	Program, (Ongoing)	W&E	C&E, HSNC, PS, EP, SHW	Multiple organizations (specified above)	\$50K	2024-2026
1-4	Identify a “Resilient Lethbridge Flagship Project” to show alignment between the various actions in this plan and demonstrate City leadership in climate adaptation, possibly a climate resilient City park or facility.	Project, (Multi-year)	W&E	Parks, W/WW/SW, P&D, OL, CSD, Facilities, C&E, HSNC	Multiple organizations (specified above)	Internal costs *may be capital cost once identified	2024-2026 *to identify project and partners

Related Initiatives for Each Action

- 1-1 GRIT – Greenhouse Gas Reduction Implementation Team (temporary internal climate mitigation team).
- 1-2 LUNER (Lethbridge Urban Nature and Environment Roundtable) is an initiative that the City of Lethbridge participates in.
- 1-3 HSNC - Natural Leaders Program for City staff; fire department fire education initiatives; Emergency Preparedness Week; City Clerk’s Office Council Orientation; Environment Week; Waste Reduction Week; Earth Day.
- 1-4 HSNC living roof and LEED certification; Lethbridge College and Cedar Ridge Quality Homes “Living Home” in the BuiltGreen Sunridge neighbourhood.



Alignment with Key City Documents:

- [Area Redevelopment Plans](#)
- [Area Structure Plans](#)
- [Corporate Strategic Plan](#)
- CASAP Cost of Inaction Report
- [Emergency Traffic Management Protocol](#)
- [Energy Conservation Master Plan and Strategy](#)
- [Gateway to Opportunity City Council Action Plan](#)
- [Land Use Bylaw](#)
- [Mobility/Accessibility Master Plan](#)
- [Municipal Development Plan](#)
- [Municipal Emergency Management Plan](#)
- [Outline Plans](#)
- [Transportation Master Plan](#)
- [Urban Construction and Design Standards](#)
- CASAP Vulnerability Mapping

THEME 2

CITY EMERGENCY PREPAREDNESS PLANNING



Goal Increase preparedness for climate-related emergencies.

Indicator % of very high and high risk acute climate hazards with detailed emergency response plans and supporting mechanisms in place

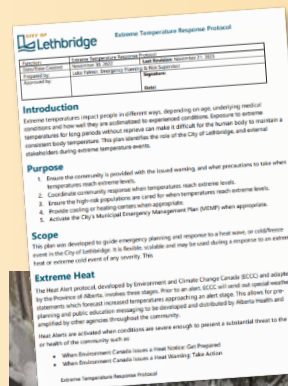
Target 100% by 2030

As extreme weather events become more common and more severe, the City's emergency preparedness planning must continue to improve. The City can improve its emergency preparedness by developing additional Emergency Response Plans (ERPs) for very high and high risk climate hazards and improving its collaboration across City departments and with regional and community partners.

Having ERPs in place helps to mitigate immediate dangers during events and helps the community recover more quickly, minimizing long-term social and economic disruptions. While we often think of emergency response planning as addressing sudden, quick-onset hazards like extreme temperatures or heavy rainfall, it is also important to plan for longer-term weather events with more chronic impacts such as severe drought. We need to continue to protect outdoor and indoor workers and other vulnerable populations during periods of extreme hot or cold, or during periods of poor air quality from wildfire smoke.

Establishing detailed recovery plans is also critical since the response to these events needs to occur rapidly. Hail, high winds, heavy snowfall, tornadoes, and floods can leave large amounts of debris after the immediate danger has passed, requiring significant effort from City staff to clean up. The City can find efficiencies by developing a rapid damage assessment process and debris management plan. Recovery phases are also key opportunities to integrate adaptive measures providing proactive adaptation planning is already in place.

Emergency response requires a whole community effort. Working together with community and regional organizations is key to improving how we respond to emergencies. These partnerships allow for the distribution of



The City is already taking action to protect people during extreme weather events. The **Extreme Temperature Response Protocol** provides guidance about when temperature warnings are issued, helps coordinate the community response, and ensures high-risk populations are cared for when temperatures reach extreme levels.



Photo courtesy Environment Lethbridge

consistent communications materials, ensuring everyone in the community receives timely and accurate information. It also allows for the pooling of resources, expertise, and information, leading to a more coordinated and comprehensive response to emergencies. Collaboration ensures that local knowledge and specific needs are integrated into broader emergency plans. This not only improves community resilience, but also allows for the exchange of best practices and lessons learned, which is vital for continuous improvement in emergency preparedness.

#	Action	Action Type	Lead	City Support	Community Connections	Cost Estimate	Start
2-1	Develop a post-event rapid damage assessment and debris management plan.	Planning	W&E	EP, LFES, TFS, 311, Parks, TR, all other departments for subject matter expertise	N/A	\$150K	2027-2030
2-2	Update corporate Emergency Response Plans (ERPs) for high-risk climate hazards.	Planning	DEM/EP	Subject matter expertise (internal), CSD, LFES	AHS, Environment and Climate Change Canada, subject matter expertise (external)	Internal costs	2024-2026
2-3	Develop department specific/customized business continuity plans.	Planning	EP	All departments	N/A	Internal costs	2024-2026

Related Initiatives for Each Action

- 2-1 Hazard Identification Risk Assessment (HIRA); ERPs; existing regular maintenance programs; emergency management coordination; existing equipment rental agreements; phone call out for after-hour emergency cleanup.
- 2-2 The Lethbridge Municipal Emergency Management Plan contains hazard-specific plans as needed; AHS (South Zone) Emergency Planning; existing Extreme Temperature Response Protocol for extreme heat and cold events; existing operational plans.
- 2-3 New ERP development/maintenance process; existing Occupational Health and Safety plans; the existing Extreme Temperature Response Protocol for extreme heat and cold events; Extreme Temperature Response Committee started in 2022; designated emergency facilities to act as cooling or warming centres.



Alignment with Key City Documents:

- CASAP Cost of Inaction Report
- [Emergency Traffic Management Protocol](#)
- [Extreme Temperature Response Protocol](#)
- [Municipal Emergency Management Plan](#)
- Occupational Health and Safety Plans
- [Urban Construction and Design Standards](#)

THEME 3

HEALTHY, SAFE, AND PREPARED COMMUNITIES



Goal Appropriate resources are readily available to support the health and safety of the community during extreme events.

Indicator % of population able to access a Climate Centre within 30 minutes (without needing a personal vehicle) during extreme heat, extreme cold, and/or wildfire smoke emergencies

Target 100% by 2034

Healthy, safe, and prepared communities are those that provide supports to all people to make it easier to cope with climate hazards. There is special consideration for vulnerable populations to ensure all residents have equitable access to the resources they need to survive and thrive after an event. The City has completed neighbourhood equity and vulnerability mapping to better understand where more at-risk populations reside to inform actions in this theme.

There are many local organizations working to improve the health, safety, and wellbeing of Lethbridge residents. Social supports, such as counselling/therapy, food hampers, and outdoor education all foster thriving communities. Despite the great programs available and initiatives underway, many people are unfamiliar with what is available to them and how to access those resources.

Who is More Vulnerable to Climate Impacts?

“Vulnerable” populations are people that are at elevated risk of exposure or impact of a climate consequence. Considering ways to effectively communicate with these groups is key (e.g., elderly populations may prefer mailed information sheets or radio updates than social media posts; translating materials into multiple languages). Those with increased vulnerability include:

- the unhoused
- children and the elderly
- those with medical conditions, including pregnancy
- those with lower income
- those with limited mobility.



Case Study: Emergency Facilities

The City of Lethbridge owns and operates multiple facilities that are accessible to the public. These facilities are areas of relief from extreme cold or heat. The City can consider expanding these locations to act as “Climate Centres” by ensuring they are also areas of refuge during smoky periods. While supports are accessible by public transit, increasing the accessibility of spaces and services must remain a priority. Visit the City’s website at <https://www.lethbridge.ca> for the latest information on openings and locations.

At the time of writing the CASAP, the following emergency facilities provide shelter from the weather:

- Lethbridge Public Library Main branch
- Lethbridge Public Library Crossings Branch
- Regional Park n’ Ride Transit terminal
- Helen Schuler Nature Centre

More daytime community supports may also be available at:

- [Interfaith Foodbank](#)
- [Lethbridge Foodbank](#)
- [Lethbridge Soup Kitchen](#)
- [Streets Alive](#)

#	Action	Action Type	Lead	City Support	Community Connections	Cost Estimate	Start
3-1	Assess and identify areas of risk to resilience of access/ egress routes for Lethbridge at large. Prioritize key City facilities and neighbourhoods that do not have multiple transportation routes (consider fire breaks, multiple exit routes, vulnerability of access roads).	Project	TR	EP, P&D, LFES (fire prevention), OL	N/A	\$50K *assessment only	2024-2026
3-2	Identify opportunities for indoor recreation during periods of extreme heat and wildfire smoke.	Assessment	W&E	R&C, Facilities, DEM	School boards, AHS, Lethbridge Sport Council, Alberta Recreation and Parks Association	Internal cost	2027-2030
3-3	Assess, upgrade, and invest in Climate Centres within the community to provide accessible spaces for residents to find relief from extreme temperatures and wildfire smoke with a priority on equitable access and proximity to vulnerable populations.	Project	CSD	Transit, P&D, Facilities, W&E	EL, SCP, Blood Tribe Department of Health, YMCA/YWCA	\$200K *assessment only	2027-2030
3-4	Partner with community organizations and develop a program to improve individual and community self-sufficiency in preparing for emergency response.	Program	EP, CSD	LPS, LFES, W&E, C&E	Regional Partners, AHS, AB Red Cross, Salvation Army, private industry, Neighbourhood Associations	Internal cost	2027-2030
3-5	Launch an annual public education campaign on the climate risks identified in this assessment and the emergency response and preparedness actions that residents can undertake to support themselves and loved ones during extreme events. Include targeted messaging to vulnerable populations.	Program	W&E	EP, C&E, CSD, LFES	Streets Alive, school boards, EL, SAGE, OWC, Red Cross, Blood Tribe Department of Health, food banks	\$100K *mainly internal costs	2024-2026

Related Initiatives for Each Action

- 3-1 Transportation Master Plan; snow and ice priority system.
- 3-2 Air quality monitoring; air quality health index; South Zone AHS Communications; Recreation and Culture Master Plan.
- 3-3 Buses as temporary warm-up centres; Extreme Temperature Response Protocol (Emergency Social Services).

- 3-4 Emergency Preparedness Week; preparedness workshops with the Canadian Red Cross.
- 3-5 Designated emergency facilities; AHS Health Matters Segments; leverage community conversations (open houses); collaborate with Climate 101 education; Emergency Preparedness Week.

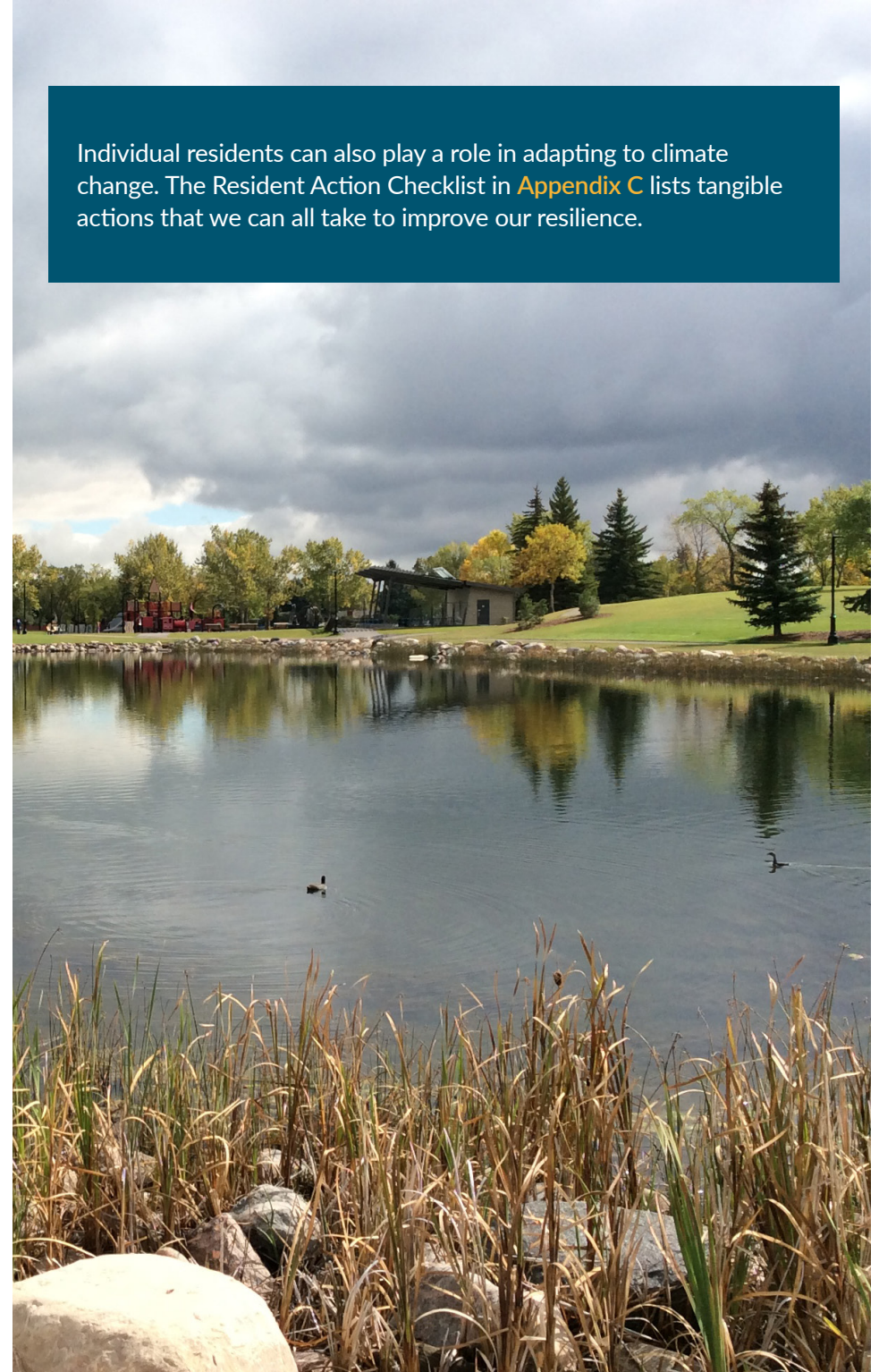


Alignment with Key City Documents:

- ❑ [Municipal Development Plan](#)
- ❑ [Municipal Emergency Management Plan](#)
- ❑ [Transportation Master Plan](#)
- ❑ [Extreme Temperature Response Protocol](#)
- ❑ [Mobility/Accessibility Master Plan](#)
- ❑ CASAP Vulnerability Mapping
- ❑ [Recreation and Culture Master Plan](#)



Individual residents can also play a role in adapting to climate change. The Resident Action Checklist in [Appendix C](#) lists tangible actions that we can all take to improve our resilience.



THEME 4 PROTECTING CRITICAL INFRASTRUCTURE



Goal Critical infrastructure is protected, and key services maintained, during extreme events.

Indicator Maintain current level of service requirements for duration of transportation interruptions as extreme storm intensity and frequency increases

Target Maintain level of service year over year

Infrastructure is a broad term that typically refers to built or engineered systems or assets that provide services to the community. This can include municipal-owned assets such as roads and water systems, as well as “green” infrastructure like stormwater ponds.

It can be difficult to know what to prioritize first. The [National Strategy for Critical Infrastructure](#) defines critical infrastructure as **the processes, systems, assets, and services that are essential to the health, safety, and economic wellbeing of Canadians**. Critical infrastructure are the assets and services required for residents’ basic standards of life.

Water and wastewater are two of the most important services the City provides. These utilities are essential for drinking water, sanitation, and cooking. A disruption to these services would significantly impact residents’ day-to-day life or lead to health impacts (e.g., illness related to poor sanitation).

The City must also prioritize the protection of major roadways and critical facilities from overland flooding. There is already a localized flooding risk due to limited stormwater system capacity. While it is costly and complex to upgrade stormwater infrastructure, it will be increasingly important as rainfall intensity increases due to climate change.

The City has emergency response plans and mitigation practices in place to protect infrastructure and service continuity, such as FireSmart practices (e.g., regular mowing), backup generators at critical facilities (e.g., water reservoir), and flood mapping. These initiatives are a strong foundation but should be enhanced to withstand future climate events.



The ten critical infrastructure sectors described in the National Strategy for Critical Infrastructure can aid in prioritizing adaptation efforts:



Stakeholders also stressed that it is important to consider the ways new neighbourhoods are designed. New neighbourhoods may not have as many ingress/egress options as older ones, which could make emergency response more difficult. Engagement with residents is needed to increase their awareness of climate risks, their vulnerabilities, and how to prepare.

#	Action	Action Type	Lead	City Support	Community Connections	Cost Estimate	Start
4-1	Develop a comprehensive wildfire mitigation plan identifying critical city infrastructure and key sites, prioritizing critical infrastructure for fire prevention, and potential risks to operation.	Planning	LFES	TR, C&E, Parks, TFS, P&D	N/A	\$50k *plan only	2027-2030
4-2	Assess/reassess and install backup power and/or onsite renewable energy to sustain critical City services during power outages (e.g., heat events overloading grid, hail or storm damage to critical equipment). Consider the critical systems/services that will be increasingly important in the future (e.g., Climate Centres).	Project	Facilities	Electric, W/WW/SW, P&D	N/A	Internal costs	Ongoing
4-3	Assess overland flood risks to community including key City sites and major transportation routes. Use findings to educate people about potential impacts and any mitigation actions that can be taken.	Assessment	W&E	W/WW/SW, Parks, P&D, Electric, Facilities, HSNC, TR, C&E	N/A	\$100k	2027-2030

Related Initiatives for Each Action

- 4-1 HIRA; Annual FireSmart grants (i.e. Forest Resource Improvement Association of Alberta - FRIAA); Emergency Response Plans; river valley closure during flood/fire; FireSmart regulations; regular mowing program to maintain breaks.
- 4-2 Existing backup generators at most critical City facilities; Emergency Response Plans; department-specific risk planning; proactive tree maintenance around utility lines.
- 4-3 HIRA; completed flood mapping; design landscaping to reduce flood risk; prioritize assets in river valley and risk analysis.



Alignment with Key City Documents:

- [Area Redevelopment Plans](#)
- [Area Structure Plans](#)
- [Climate Vulnerability & Risk Assessment](#)
- [Energy Conservation Master Plan and Strategy](#)
- [Extreme Temperature Response Protocol](#)
- [Land Use Bylaw](#)
- [Mobility/Accessibility Master Plan](#)
- [Municipal Development Plan](#)
- [Municipal Emergency Management Plan](#)
- [Outline Plans](#)
- [Transportation Master Plan](#)

THEME 5 RESILIENT DESIGN



Goal Communities and infrastructure are designed to account for future climate conditions.

Indicator % of asset design standards and guidelines updated for future climate conditions

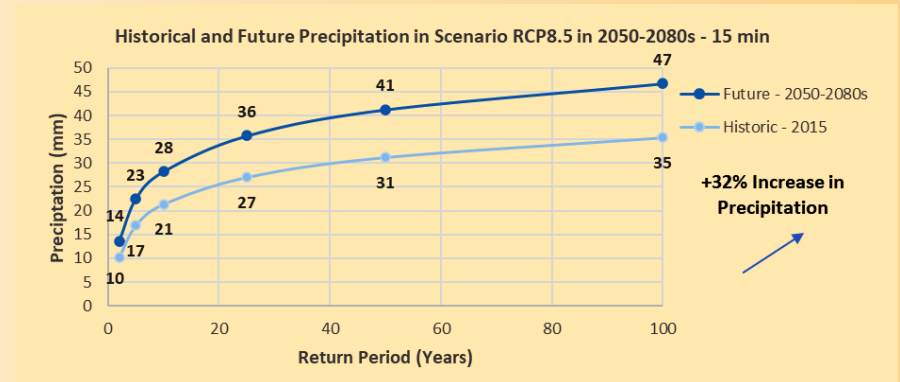
Target 100% by 2034

With more frequent and intense extreme weather events on the horizon, **where we build and how we build will only become more important.** Resilient design considers the future climate and ensures design is sufficient to withstand more extreme events. New infrastructure and buildings will need to be able to withstand increased temperatures, extreme precipitation, hail, and smoke. Existing structures and infrastructure will need to account for future climate conditions during renewals/replacement.

Infrastructure design standards may be mandated by Federal and/or Provincial law. These standards are minimums that must be met, but higher or more rigorous standards may be voluntarily adopted.



Intensity-Duration-Frequency (IDF) curves are used to design stormwater management systems. The federal government has updated IDF curves for future climate conditions and are available on [ClimateData.ca](https://climate.data.ca).



Infrastructure Canada has been collaborating with the National Research Council of Canada (NRC) and the Standards Council of Canada (SCC) to update codes and standards to support climate adaptation and enhance resilience of infrastructure.

Infrastructure should be designed for the climate conditions that will occur at the end of the life of that asset. For example, an asset that is in use for 20 years will have to deal with less change in extreme climate conditions than an asset that is in use for 100 years. Codes and standards outline the minimum requirements and local governments may voluntarily increase design requirements in order to increase the resilience of the infrastructure. The City can explore options to voluntarily adopt resilient design practices at a neighbourhood-scale (e.g., preventing development in future flood-risk areas, adding larger stormwater management systems) that are within its control to implement and enforce.

The City may consider collaborating with developers to develop voluntary performance and resilience guidelines that could speed up adoption of resilient building practices. Incentives could be explored, such as reduced development charges or expansion of the successful Lethbridge CEIP, which could encourage participation.

#	Action	Action Type	Lead	City Support	Community Connections	Cost Estimate	Start
5-1	Develop business processes for integrating climate risk and resilience into City of Lethbridge capital projects.	Policy	TFS	Facilities, W&E, Legal (Procurement)	N/A	\$100k	2024-2026
5-2	Integrate climate actions (retrofit, replacement) and impacts (O&M frequency and reduced lifespan) into asset management plans. Utilize the Cost of Inaction Report to prioritize investment based on the City infrastructure and services that will be most impacted by climate change.	Planning	TFS	All departments with asset management plans	N/A	\$200k	2024-2026
5-3	Update infrastructure design standards for public property to align with federal climate-informed standards and building code updates.	Policy	UC	W&E, all departments for subject matter expertise	BILD, LCA	\$50K	2024-2026
5-4	Develop Resilient Lethbridge Building and Development Guidelines to encourage improved resilience of new developments.	Policy	W&E	Facilities, P&D	BILD, LCA	Internal costs	2027-2030
5-5	To protect from power outages due to extreme heat and other events, promote energy independence through grid modernization. Enable greater battery storage and renewable energy.	Project	Electric	W&E, Facilities	N/A	\$500k per year	2027-2030

Related Initiatives for Each Action

- 5-1 Grant funding tied to climate adaptation maturity; municipal capital grants; Hazard Risk and Vulnerability Analysis; MDP; Enterprise Risk Management.
- 5-2 Hazard Risk and Vulnerability Analysis; Enterprise Risk Management; existing asset management plans.
- 5-3 Federal and Provincial codes; ALIDP; EL "Living Cities Project" (Green Communities Canada) is an additional resource.
- 5-4 MDP; Area Structure Plans (ASPs); Area Redevelopment Plans (ARPs); EL Living Cities Project; AHS South Zone Healthy Communities by Design; CEIP/rebates; building codes.
- 5-5 CEIP; facility retrofits; solar initiatives.



Alignment with Key City Documents:

- [Area Redevelopment Plans](#)
- [Area Structure Plans](#)
- [Climate Vulnerability & Risk Assessment](#)
- CASAP Cost of Inaction Report
- [Energy Conservation Master Plan and Strategy](#)
- [Land Use Bylaw](#)
- [Municipal Development Plan](#)
- [Municipal Emergency Management Plan](#)
- [Outline Plans](#)
- [Urban Construction and Design Standards](#)

THEME 6 WATER STEWARDSHIP



Goal Reduce community-wide water use and prepare for a future with less water in the summer months.

Indicator % water reduction from 2023 baseline

Target City and residential targets to be set in the Water Conservation Plan and Strategy

Drought can impact human health and safety due to insufficient water supply or poor water quality, challenging agricultural conditions, and aquatic ecosystem stress. It is a hazard that builds over time and can last an extended period, unlike an acute or short duration hazard like hail.

Increased frequency and likelihood of drought conditions will be driven by a shift of when and how precipitation falls on the watershed. Generally, more rainfall and snowmelt runoff will occur in the spring increasing river flows which will then drop off significantly in the long, hot, and dry summer months. With glaciers rapidly receding, the baseflow in rivers and groundwater levels will further reduce. Water storage in the spring months, reduced outdoor water use in the summer months, and overall reduced water usage per capita will all be key measures to prepare for changing water availability. Some other key measures include:

Communication & Education

All water users play a role in responding to drought. Education and information sharing can help foster behaviour change towards water conservation. The HSNC is one organization already offering programming on this topic.

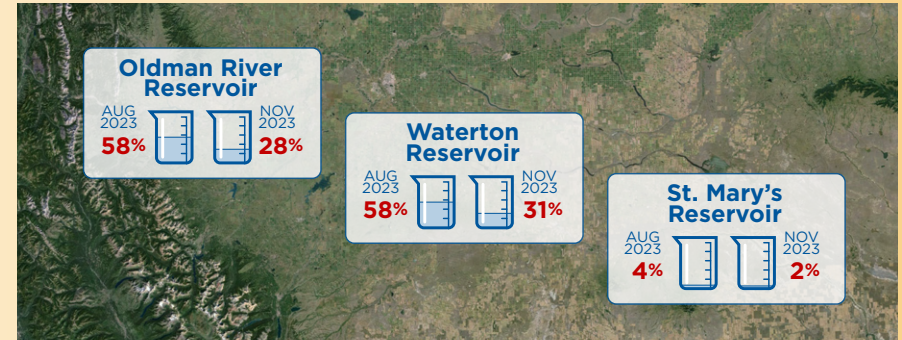
Regional Collaboration

The City and external partners work together on water forecasting, rationing proposals, and irrigation monitoring. Partnerships with users in the Oldman Watershed are important as the City expands conservation efforts.

Drought Context in 2024

As of December 2023, Alberta is in water shortage management Stage 4 (out of 5), meaning a significant number of water users will be impacted over a persistent period.

As of January 2024, the City is in the process of developing a Water Conservation Plan and Strategy that will include targets for water use reduction. Updates to the Water Rationing Plan are also underway. The water use reduction targets and restrictions set in these documents will be key in the City's response to drought conditions.



#	Action	Action Type	Lead	City Support	Community Connections	Cost Estimate	Start
6-1	Develop and implement a Water Conservation Plan and Strategy including an update to the Water Rationing Plan in the context of future climate conditions for the betterment of residents, industry, and ecosystems.	Planning	W&E	W/WW/SW, Parks, EP, LFES, C&E, TFS, Facilities, building occupants/operational departments	OWC, College, EL, AB Agriculture and AG Canada	Internal costs	2024-2026
6-2	Establish water conservation targets in the context of future climate and report on progress with specific requirements for responsible water use on City property (e.g., xeriscaping, water reuse, efficient irrigation, planting selection).	Policy	W&E	W/WW/SW, Facilities, Parks, P&D	OWC, College, EL, AB Agriculture and AG Canada	Internal costs	2024-2026
6-3	Review and update City irrigation service levels and procedures to reflect best practices in outdoor water use (e.g., equipment, timing of watering) and strategically managing our water use through technology. Consider high efficiency sprinkler systems when developing new parks or renewing existing park areas.	Policy	Parks	W/WW/SW, W&E	N/A	\$300K	2024-2026
6-4	Complete an in-depth investigation of how water and wastewater operations will be impacted by climate (particularly extreme heat).	Assessment	W/WW/SW	TFS, Parks, W&E	N/A	\$11M *efficiency improvements	2027-2030
6-5	Collaborate with local organizations and internal partnerships to provide and promote educational programming on severe drought and the importance of water conservation.	Program	W/WW/SW, W&E	HSNC, C&E, Parks	EL, OWC	Internal costs	2024-2026

Related Initiatives for Each Action

- 6-1, 6-2, 6-5 Existing coordination with external partners (Irrigation Districts, Alberta Environment, Oldman Watershed Council, Oldman Watershed Sub-basins, Business and industrial partners); storm ponds and land acquisition; irrigation water metering & efficiency; MDP.
- 6-3 Parks Naturalization Project; irrigation usage monitoring; centralized irrigation.
- 6-4 Water and wastewater treatment plant improvements; water and wastewater treatment plant energy audits.



Alignment with Key City Documents:

- [Area Redevelopment Plans](#)
- [Area Structure Plans](#)
- [Climate Vulnerability & Risk Assessment](#)
- CASAP Cost of Inaction Report
- [Land Use Bylaw](#)
- [Municipal Development Plan](#)
- [Outline Plans](#)
- Water Conservation Plan
- Water Rationing Plan



THEME 7 TRANSITIONING LANDSCAPES



Goal Increase the equity of drought and heat tolerant landscapes across the City.

Indicator % of new City facility landscaping area that is drought and heat tolerant

Target 75% by 2034

When you spend time in Lethbridge, it is easy to forget that today's vegetation and landscape is quite different than it once was. Prior to development, drought resistant grasses and low-lying vegetation made up the natural landscape of the region. The Transitioning Landscapes theme recognizes that incorporating native vegetation and enhancing natural landscapes will be beneficial as the climate changes.

Developers, residents, and the City planted non-native trees and other introduced species as the community was established. While these plantings are beautiful and serve as public amenities (e.g., parks with trees provide shade/cooling; improved mental health), they are not necessarily suited for the climate or water availability.

Tree and vegetation maintenance is key for the success of transitioning landscapes. Rather than focusing primarily on new plantings, it will be important for the City to expand maintenance efforts to limit urban tree die off. Tree maintenance requirements will increase with more drought, heat, and other extreme events.

Thoughtful landscape planning can help reduce flood risk. Careful plant selection maximizes that amount of rainfall that is absorbed, reducing the amount of runoff entering the stormwater drainage system. Rain gardens are one example of LID that the City and residents can adopt relatively easily.

Lethbridge should reestablish native vegetation that is suited for the new climate realities. Planting trees that require large water inputs is not sustainable. In 2023 a list of suitable trees and shrubs was produced by the City's Parks department, which can be integrated in development standards and guidelines.



Tree maintenance in Lethbridge residential neighbourhood (Source: Lethbridge Heritage Trees)



Prairie Urban Garden photos immediately above and at right courtesy Connie Simmons, Oldman Watershed

How are drought and flooding related? Drought will occur more often and be more severe as there is earlier snowmelt and longer, hotter, and drier summers. In hot, dry conditions the ground will become harder, resulting in less water absorption during intense rainfall, and increased runoff that can lead to flooding.



Case study: Oldman Watershed Council's Prairie Urban Garden

The Oldman Watershed Council (OWC) shares public resources on transitioning yards to xeriscape that naturally thrive in a dry prairie environment. A step-by-step guide to planting a Prairie Urban Garden, including appropriate plant species, supports residents in making changes.



#	Action	Action Type	Lead	City Support	Community Connections	Cost Estimate	Start
7-1	Develop program to integrate climate resilient plant species and increased topsoil requirements in City projects, policy, and design standards. Requirements should be applicable to the City as an organization, the private sector, and residential developments.	Program	Parks	P&D, OL, UC	EL, OWC, local greenhouses/nurseries	Internal costs, ongoing operating	2024-2026
7-2	Enhance current programs and deliver an educational campaign explaining how private landscapes can help to moderate both flood and drought.	Program	W&E	HSNC, Parks, Library, W/WW/SW, C&E, P&D	Neighbourhood associations, ALIDP, OWC, EL, SAGE, KEPA, Naapi's Garden, post-secondaries, developers	\$50k	2024-2026
7-3	Increase maintenance activities for new and existing plantings to ensure long-term healthy landscapes.	Policy	Parks	P&D, W&E	N/A	TBD	2027-2030
7-4	Support neighbourhoods that are more vulnerable to climate change by strategically investing in nature in these locations.	Policy	Parks	P&D, HSNC, W&E	N/A	Internal costs	2027-2030

Related Initiatives for Each Action

- 7-1 Climate resilient tree and shrubs list; OWC has Prairie Urban Garden project promoting xeriscaping.
- 7-2 HSNC (Natural Leaders Project, pollinator cafes, 1000 trees, etc.); OWC and EL resources; school education; existing private (retrofit) landscapes; Horticultural Advice Program.
- 7-3 Parks Master Plan; River Valley Health Assessment; Urban Forest Management Plan.
- 7-4 Statutory plans; AHS SZ Healthy Communities by Designs.



Alignment with Key City Documents:

- [Area Redevelopment Plans](#)
- [Area Structure Plans](#)
- [Climate Vulnerability & Risk Assessment](#)
- [Land Use Bylaw](#)
- [Municipal Development Plan](#)
- [Outline Plans](#)
- Water Conservation Plan
- Water Rationing Plan

THEME 8 PROTECTING AND ENHANCING NATURE



Goal Value, conserve, and enhance the multiple services that natural areas provide.

Indicator % improvement over baseline biodiversity (Biodiversity Strategy) and River Valley Health Assessment (to be updated)

Target Increase year over year

Protecting ecosystems provides services such as water storage and retention, shade, and heat reduction and can be more adaptable and less costly than installing engineered infrastructure. Enhancing and protecting natural resources will help ensure that the ecosystem services we rely upon continue to provide benefits into the future.

Ecosystem services are the natural processes that provide humans with the goods and services we need for a high quality of life. The Ecosystem Services Wheel provides several examples of these benefits, such as water purification and recreation. Natural features, such as urban trees and the wildlife and pollinators found throughout Lethbridge provide ecosystem services.

The River Valley is one of the largest city park systems in Canada with 4,000 acres of parkland, 177km of paved trails, and another 57km of gravel trails. The Oldman River Valley is home to 23 species of native fish, 31 species at risk, and 13 rare plant species. The River Valley Area Redevelopment Plan and Parks Master Plan are important tools for the protection and enhancement of the River Valley.



Case Study: Integrated Pest Management and Invasive Weed Pulls

Two ways of protecting and enhancing nature are the implementation of the Integrated Pest Management Plan and the removal of invasive species. The Helen Schuler Nature Centre involves the community by hosting Invasive Weed Pull events that help to protect the biodiversity of the area. Expanding public knowledge in the identification and management of invasive species will become more critical in the face of climate change.



Photo courtesy Oldman Watershed

Environment Lethbridge worked with Green Communities Canada to feature Lethbridge as a pilot community within the Living Cities Project. The pilot provided recommendations for the City to increase and improve green infrastructure, many of which support CASAP actions:

- Establishment of requirements/standards, including LID
- Mapping natural areas and prioritizing protection
- Increasing stakeholder collaboration with particular focus on improving social equity

#	Action	Action Type	Lead	City Support	Community Connections	Cost Estimate	Start
8-1	Develop a Biodiversity Strategy and policy in alignment with climate risks and integrate within planning and policies.	Planning	W&E	HSNC, P&D, Parks, C&E	AB Ag and Ag Canada	\$200k	2027-2030
8-2	Develop a plan and supporting tools to identify and prioritize natural areas for protection in the context of climate risks.	Planning	Parks	W&E, P&D, HSNC, TFS	OWC	\$200k	2027-2030
8-3	Create a formal partnership to act on improving riparian habitat restoration in the River Valley. Update existing River Valley Health Assessment and identify priority actions for public education, investment, and policy changes (e.g., restrictions on development in the area).	Partnership	Parks	HSNC, P&D, W&E	OWC, SAGE, C&F, AB Ag, Ag Canada	\$300k	2027-2030
8-4	Continue to expand education, monitoring, and management programs for invasive species to better understand and manage their risks. Ensure adequate budget is in place to respond to infestations as they are expected to increase in the future.	Procedure	Parks	HSNC, C&E	Ag Canada, CFIA and STOPDED, University and/or College	TBD	2027-2030

Related Initiatives for Each Action

- 8-1 Natural asset inventory, Russian olive and invasive species mapping; Parks Master Plan; Tree Lifecycle Program; River Valley Health Assessments; Native Cottonwood Project trial.
- 8-2 Natural Asset Inventory.
- 8-3 Natural Asset Inventory; River Valley Health Assessment by Cows & Fish; Native Cottonwood Project; River Valley Parks Master Plan.
- 8-4 Integrated pest management program, currently working with CFIA and STOPDED for arboreal pests.



Alignment with Key City Documents:

- [Climate Vulnerability & Risk Assessment](#)
- [Municipal Development Plan](#)
- Natural Asset Inventory
- Parks Master Plan
- River Valley Health Assessment
- River Valley Parks Master Plan

MANAGING THE CASAP

Implementation and Governance

The success of the CASAP will require the support of the key stakeholders who helped shape the vision, principles, and actions. Visible sponsorship from the **City Council** will be key in implementing the CASAP.

Implementation of specific actions are the responsibility of the lead department identified. **Waste & Environment** will play a coordination role, monitor data, and report on collective action and progress towards the goals of the CASAP. Internal and external partnerships will also support the integration of the CASAP into future City strategic and corporate plans and initiatives.

Monitoring and Evaluation

Monitoring and evaluating CASAP implementation is key to ensuring its efficacy and success. An initial list of indicators has been identified to measure the goals of the CASAP and these should continue to be refined by the City. Tracking progress against these indicators will assist the City in determining the success of the Plan, if additional resources are needed to achieve the goals, and where adjustments may be needed.

Indicators will be evaluated by **Waste & Environment** and, if necessary, modified with progress being **publicly reported on an annual basis**.

Plan Renewal

The **CASAP will be reviewed and updated by the City every five years**.

This process will include:

- An update on progress to date;
- Revision or addition of actions as needed;
- Integration of any new or updated climate projections and risks; and,
- Alignment with updated City policies and guidance documents.

Funding

Adequate funding and additional resources may need to be secured to implement the actions in the CASAP. Cost estimates have been provided in the action tables and will inform future business planning. Adaptation actions are not necessarily stand-alone actions, as many actions are part of other initiatives which may require incremental adjustments to budgets. Potential external funding sources should be leveraged where possible.



Resident Action and Engagement

This CASAP helps to frame and focus future resident conversations. Many of the actions will include public engagement and education during implementation. In the spirit of collective action, a checklist summarizing some actions that can be taken by residents are included in **Appendix C**.

Moving Forward, Together

Climate adaptation requires collaboration between municipal departments, community organizations, and residents. Many opportunities for partnerships and initiatives were identified in the creation of this plan. There is a lot of great work underway locally and there is no need to start from scratch. By working together and leveraging existing knowledge, we can enhance existing initiatives and initiate new ones that meaningfully help us adapt to climate change.

MEASURING SUCCESS

Monitoring can be complex given the diverse types of actions, impacts of climate hazards, involvement of various City departments, and the collaboration with many community stakeholders. The City has selected indicators for each of the 8 themes to track progress towards the overarching goal. Using a smaller list of indicators (rather than a separate indicator for each action) makes it more

manageable to report annually on the CASAP. The theme-specific indicators still allow the City to track overall progress on the adaptation efforts. Flexibility will be important in adjusting the indicators to align with evolving municipal priorities and national and international reporting requirements.

Theme	Goals	Indicators	Target
Theme 1: Enabling Initiatives	Climate adaptation action is coordinated both internal and external to the City.	# hours of internal climate collaborations per year; # hours of external climate collaborations per year	12 hours internal and 8 hours external, sustained 2026+
Theme 2: City Emergency Preparedness Planning	Increase preparedness for climate-related emergencies.	% of very high and high risk acute climate hazards with detailed emergency response plans and supporting mechanisms in place	100% by 2030
Theme 3: Healthy, Safe, and Prepared Communities	Appropriate resources are readily available to support the health and safety of the community during extreme events.	% of population able to access a Climate Centre within 30 minutes (without needing a personal vehicle) during extreme heat, extreme cold, and/or wildfire smoke emergencies	100% by 2034
Theme 4: Protecting Critical Infrastructure	Critical infrastructure is protected, and key services maintained, during extreme events.	Maintain current level of service requirements for duration of transportation interruptions as extreme storm intensity and frequency increases.	Maintain level of service year over year
Theme 5: Resilient Design	Communities and infrastructure are designed for future climate conditions.	% of asset design standards and guidelines updated for future climate conditions	100% by 2034
Theme 6: Water Stewardship	Reduce community-wide water use and prepare for a future with less water in the summer months.	% water reduction from 2023 baseline	City and residential targets to be set in the Water Conservation Plan and Strategy
Theme 7: Transitioning Landscapes	Increase the equity of drought and heat tolerant landscapes across the City.	% of new City facility landscaping area that is drought and heat tolerant	75% by 2034
Theme 8: Protecting and Enhancing Nature	Value, conserve, and enhance the multiple services that natural areas provide.	% improvement over baseline biodiversity (Biodiversity Strategy) and River Valley Health Assessment (to be updated)	Increase year over year

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APPENDIX A: WORKSHOP PARTICIPATION

Name	Workshops								
	S1	S2	S3	C1	C2	C3	C4	C5	C6
Staff Stakeholder List									
Planning & Design – Steering Committee	●	●	●		●	●	●		●
Helen Schuler Nature Centre – Steering Committee	●	●	●	●		●	●	●	●
Indigenous Relations – Steering Committee	●	●		●		●			
Emergency Planning – Steering Committee	●	●	●	●	●			●	●
Waste & Environment – Steering Committee	●	●	●	●	●	●	●	●	●
Facility Services	●	●	●	●	●		●		●
Transportation	●	●	●	●				●	
Transit		●	●						
Fleet Services	●	●	●						
Opportunity Lethbridge		●	●						
Financial Planning & Budget Management; Treasury and Financial Services	●			●					
Water, Wastewater, Stormwater	●	●	●	●	●	●	●	●	
Waste & Environment			●	●	●				
Electric Utility	●	●	●				●		
Parks and Forestry	●	●	●	●			●		●
CSD	●	●	●			●			●
Partner Services	●								
Airport		●	●	●	●				●
Communications & Engagement				●					
Chief of Fire/EMS							●		

Name	Workshop					
	C1	C2	C3	C4	C5	C6
External Stakeholder List						
Environment Lethbridge – Steering Committee (also participated in Workshops S1 to S3)	●	●	●	●	●	●
Lethbridge Construction Association	●	●	●		●	
BILD	●	●	●		●	
Alberta Health Services – South Zone	●	●	●	●	●	●
Lethbridge College	●	●		●	●	
Lethbridge Housing Authority	●	●	●			
Lethbridge Family Centre		●				
Lethbridge Senior Citizens Organization	●	●				
Green Acres Foundation	●	●				
University of Lethbridge Students' Union	●	●				
Oldman Watershed Council		●				●
Downtown BRZ		●	●			
Economic Development Lethbridge					●	
Tourism Lethbridge	●					
Southern Alberta Group for the Environment	●	●	●	●	●	●
University of Lethbridge Postdoctoral Fellow			●	●	●	●

“S” workshop type = City staff only

“C” workshop type = City staff and community groups

● = attended workshop

APPENDIX B: SUPPLEMENTARY DETAIL AND ADDITIONAL ACTIONS FOR FUTURE CONSIDERATION

Additional details to support action implementation are provided as bullet points in this section. Supplementary detail may be specific subtasks or narrative providing clarification on how the action should be approached.

Theme 1: Enabling Initiatives

#	Action
1-1	<p>Develop City of Lethbridge climate adaptation partnerships to implement and inform the delivery of the CASAP.</p> <ul style="list-style-type: none"> • These partnerships should provide guidance on how to maintain momentum between Council terms and budget cycles, as well as monitor progress. • Partnerships with Senior and Executive Leadership are critical to ensure climate adaptation considerations cascade through the organization. • Develop an implementation plan and communication plan for the CASAP. • Work together to refine climate adaptation indicators and targets.
1-2	<p>Initiate and maintain close working relationships with community and regional organizations to foster collaboration and find synergies between local and regional climate adaptation initiatives.</p> <p>Near term priorities could include:</p> <ul style="list-style-type: none"> • Co-create with agricultural partners, farmers, and surrounding communities a regional approach to grassfire reduction. • Develop relationships and engage with local Indigenous organizations and groups serving equity-deserving peoples to support climate action. • Collaborate with community organizations to align actions (continue collaboration with organizations part of this adaptation planning process). • Acknowledge and prioritize reconciliation in climate action.
1-3	<p>Establish a framework and coordinate internal and external delivery of climate change education including climate risks, adaptation actions and emergency preparedness.</p> <ul style="list-style-type: none"> • Find synergies between existing education initiatives (internal and external) and identify any gaps. Includes education actions in Themes 2-4 and 6-8. • Foster collaboration between the City and non-City organizations in program delivery. • Education on actions should be targeted to different groups utilizing various communications channels and in multiple languages.
1-4	<p>Identify a “Resilient Lethbridge Flagship Project” to show alignment between the various actions in this plan and demonstrate City leadership in climate adaptation, possibly a climate resilient City park or facility.</p> <ul style="list-style-type: none"> • Use the project as a mechanism to foster collaboration between the public and private sector. • The project should aim to develop an ambitious, yet achievable project, in collaboration with both internal and external stakeholders. • Consider equity at every stage of the project (scoping, planning/design, construction, operations/maintenance) to promote a more inclusive, just community. <p>The project could consider the following as a starting point:</p> <ul style="list-style-type: none"> • The City’s role in the project (to facilitate or lead implementation). • Project scope/scale (buildings, sites, communities), status (existing or new communities), and phasing of the project(s). • Lessons learned from the demonstration be applied elsewhere (i.e., want to ensure the demonstration leads to broader progress/outcomes).

Theme 2: City Emergency Preparedness Planning

#	Action
2-1	Develop post-event rapid damage assessment and debris management plan. The assessment and management plan may include: <ul style="list-style-type: none">• Tools for rapid assessment including 'drop a pin' in parks and valleys.• Predetermined resourcing and coordination needs.• Data requirements which could include the type of event, damage, clean up response time, costs for clean up (lost time, etc.).
2-2	Update corporate Emergency Response Plans (ERPs) for high risk climate hazards. <ul style="list-style-type: none">• Develop ERPs for wildfire smoke, grassfire, drought, flood, hail and intense storm.• Re-evaluate extreme weather ERP for community health risk supports.
2-3	Develop department specific/customized business continuity plans.

Theme 3: Healthy, Safe, and Prepared Communities

#	Action
3-1	Assess and identify areas of risk to resilience of access/egress routes for Lethbridge at large. Prioritize key City facilities and neighbourhoods that do not have multiple transportation routes (consider fire breaks, multiple exit routes, vulnerability of access roads).
3-2	Identify opportunities for indoor recreation during periods of extreme heat and wildfire smoke. <ul style="list-style-type: none">• May include City facilities or partnerships with external organizations.
3-3	Assess, upgrade, and invest in Climate Centres within the community to provide accessible spaces for residents to find relief from extreme temperatures and wildfire smoke with a priority on equitable access and proximity to vulnerable populations. <ul style="list-style-type: none">• Consider ways to allow for Climate Centres to be located throughout the City, with consideration of vulnerable communities.• Wherever possible, ensure accessibility by transit and extended operational hours (ideally 24 hours for high utilized spaces).
3-4	Partner with community organizations and develop a program to promote initiatives that improve individual and community self-sufficiency in preparing for emergency response. <ul style="list-style-type: none">• Consider development of Community Emergency Response Teams (CERTs).• Elevate public knowledge of existing programs that encourage citizens to check on vulnerable populations (isolated, elderly, limited mobility, etc.).• Emergency preparedness week including community engagement.
3-5	Launch an annual public education campaign on the climate risks identified in this assessment and the emergency response and preparedness actions that residents can undertake to support themselves and loved ones during extreme events. Include targeted messaging to vulnerable populations. <ul style="list-style-type: none">• Messaging should consider multiple languages and methods of communication; partner with trusted messengers to help with outreach.

Theme 4: Protecting Critical Infrastructure

#	Action
4-1	<p>Develop a comprehensive wildfire mitigation plan identifying critical city infrastructure and key sites, prioritizing critical infrastructure for fire prevention, and potential risks to operation. The mitigation plan could include:</p> <ul style="list-style-type: none">• Costs to effectively address the risk.• Consideration of FireSmart principles.• Guidelines to install firebreaks and adequate resourcing for maintenance (e.g., removing vegetation).• Engagement with the City facilities department and local developers in FireSmart principles.
4-2	<p>Assess/reassess and install backup power and/or onsite renewable energy to sustain critical City services during power outages (e.g., heat events overloading grid, hail or storm damage to critical equipment). Consider the critical systems/services that will be increasingly important in the future (e.g., Climate Centres). Assess the backup power capabilities to sustain critical services (i.e., full operation, emergency lighting only, etc.).</p> <ul style="list-style-type: none">• Consider strategic protection of facility components that could be impacted by climate events such as exposed power or communications.• Prioritize investments in critical facilities and services including emergency shelters or Climate Centres.
4-3	<p>Assess overland flood risks to community including key City sites and major transportation routes. Use findings to educate people about potential impacts and any mitigation actions that can be taken.</p> <ul style="list-style-type: none">• Use overland flooding maps to identify high risk locations.• Investigate potential funding for stormwater upgrades.• Prioritize overland flood protection at critical City sites.

Theme 5: Resilient Design

#	Action
5-1	<p>Develop business processes for integrating climate risk and resilience into City of Lethbridge projects. Consider:</p> <ul style="list-style-type: none">• Capital projects (CIP and operating budgets).• Planning processes and strategic documents (business continuity); review with internal and external stakeholders.• Operational impacts and resourcing.• Project procurement requirements.
5-2	<p>Integrate climate actions (retrofit, replacement) and impacts (O&M frequency and reduced lifespan) into asset management plans. Utilize the Cost of Inaction Report to prioritize investment based on the City infrastructure and services that will be most impacted by climate change.</p>
5-3	<p>Update infrastructure design standards for public property to align with federal climate-informed standards and building code updates.</p> <ul style="list-style-type: none">• Community planning and urban design and construction (new and existing) should consider stormwater management and low impact development, tree canopy and placement, and protection of high value natural assets.• Prioritize updating stormwater standards including climate-informed Intensity-Duration-Frequency curves. Check infiltration into sanitary sewers and parameters related to sanitary sewer wet-weather flows.• Planning and Design to propose updates to Council regarding the landscaping and site design regulations of the Land Use Bylaw to reflect climate change realities.

-
- 5-4 Develop Resilient Lethbridge Building and Development Guidelines to encourage improved resilience of new developments.
 - This could include setting measurable targets, developing guidance/best practices and providing incentives (e.g., reduced development charges, expedited permit review) to encourage exemplary performance.
 - Consider buildings (interior and exterior measures): indoor air quality, temperature regulation, damage reduction from extreme events.
-
- 5-5 To protect from power outages due to extreme heat and other events, promote energy independence through grid modernization. Enable greater battery storage and renewable energy.
 - Electric to provide technical support and expertise for corporate renewable energy projects.

Theme 6: Water Stewardship

#	Action
6-1	<p>Develop and implement a Water Conservation Plan and Strategy including an update to the Water Rationing Plan in the context of future climate conditions for the betterment of residents, industry, and ecosystems.</p> <ul style="list-style-type: none"> • Consider bylaws and policies to reflect and enforce the Plan. • Maintain open dialogue with water users, industry, and environmental organizations to share information and mutual understanding.
6-2	<p>Establish water conservation targets in the context of future climate and report on progress with specific requirements for responsible water use on City property (e.g., xeriscaping, water reuse, efficient irrigation, planting selection).</p> <ul style="list-style-type: none"> • Separate targets should be set for residential consumption and industry/business.
6-3	<p>Review and update City irrigation service levels and procedures to reflect best practices in outdoor water use (e.g., equipment, timing of watering) and actively and strategically managing our water use through technology. Consider high efficiency sprinkler systems when developing new parks or renewing existing park areas.</p>
6-4	<p>Complete an in-depth investigation of how water and wastewater operations will be impacted by climate (particularly extreme heat).</p> <ul style="list-style-type: none"> • Recognize the importance of efficiency and the impacts to operations and identify potential improvements (e.g., connection between energy used for aeration and extreme heat). • Use findings to inform operations and maintenance processes moving forward.
6-5	<p>Collaborate with local organizations and internal partnerships to provide and promote educational programming on severe drought and the importance of water conservation.</p> <ul style="list-style-type: none"> • Explain the link between water availability and the local economy (e.g., agrifood). • Focus on achieving outcomes rather than pure information sharing. • Move beyond the public as the main audience for education to include local group/organization outreach and knowledge sharing.

Theme 7: Transitioning Landscapes

#	Action
7-1	<p>Develop program to integrate climate resilient plant species and increased topsoil requirements in City projects, policy, and design standards. Requirements should be applicable to the City as an organization, the private sector, and residential developments.</p> <ul style="list-style-type: none">• Develop climate-informed plant species list.• Propose updates to the Land Use Bylaw to include climate resilient landscaping.• Evaluate and enhance requirements for topsoil depth and quality to support vegetation establishment.• Engagement with relevant stakeholders to encourage adoption and procurement of native plantings.• Provide education and follow up with stakeholders to ensure requirements are being followed.
7-2	<p>Enhance current programs and deliver an educational campaign explaining how private landscapes can help to moderate both flood and drought.</p> <ul style="list-style-type: none">• Focus campaign on drought and heat tolerant plants that are suited for our climate.• Detail on-site water retention techniques (i.e., low impact development, downspouts to vegetation, rain barrels).
7-3	<p>Increase maintenance activities for new and existing plantings to ensure long-term healthy landscapes.</p> <ul style="list-style-type: none">• Increase budget for maintenance, recognizing that there will be additional maintenance requirements due to damage and debris from extreme events as well as vegetation die off from hotter and drier conditions.
7-4	<p>Support neighbourhoods that are more vulnerable to climate change by strategically investing in nature in these locations.</p> <ul style="list-style-type: none">• Utilize neighborhood vulnerability mapping to inform plans and policies. Guide decision-making by considering how certain neighborhoods are disproportionately impacted by climate change and how nature can help reduce risk.

Theme 8: Protecting and Enhancing Nature

#	Action
8-1	<p>Develop Biodiversity Strategy and policy in alignment with climate risks and integrate within planning and policies.</p>
8-2	<p>Develop a plan and supporting tools to identify and prioritize natural areas for protection in the context of climate risks.</p> <ul style="list-style-type: none">• Consider natural asset management (inventory, valuation, risk assessment, management plan).• Map additional Environmental Significant Areas (ESA).
8-3	<p>Create a formal partnership to act on improving riparian habitat restoration in the River Valley. Update existing River Valley Health Assessment and identify priority actions for public education, investment, and policy changes (e.g., restrictions on development in the area).</p>
8-4	<p>Continue to expand education, monitoring, and management programs for invasive species to better understand and manage their risks. Ensure adequate budget is in place to respond to infestations as they are expected to increase in the future.</p> <ul style="list-style-type: none">• Develop a local invasive species list.• Engage the public using communication channels suitable for diverse demographics.

Additional Strategies for Consideration (within next 10 years)

Hundreds of potential actions were voted on by stakeholders during the development of the CASAP. While the priority actions presented above represent a significant amount of effort to systematically prioritize, there are other high scoring adaptation actions that the City may wish to consider in the future. Although the actions presented below emerged as important during workshops, they did not have a high enough cost benefit ratio to include in the final CASAP. Participants felt it was important to include them for future consideration if funding and resources become available.

Actions for Future Consideration

Theme 3: Healthy, Safe, and Prepared Communities

- Actions
- Promote existing mental health resources within the community, with particular attention on vulnerable groups (e.g., elderly, young children, unhoused people).
 - Implement a public engagement campaign to encourage participation in regenerative agriculture, local food production, and community supported agriculture.
 - Complete research to understand the barrier to community health clinics having health care professionals available.
 - Advocate for increased funding for medical services, especially interdisciplinary teams (e.g., Nurse Practitioners, mental health professionals, social workers).

Theme 5: Resilient Design

- Actions
- Research existing grant programs (i.e., CEIP) and advocate for new funding sources. Consider options holistically: solar, wind, battery, geothermal, air source heat pumps, EV chargers, energy efficient windows, shading, blower door test, etc.

Theme 6: Protecting and Enhancing Nature

- Actions
- Install more trail marker signage/wayfinding features to reduce rogue trail making in the pathway system and protect habitat. Include educational signage on why it is important to stay on the path and what areas should be used for (e.g., off leash, conservation, biking, etc.).

APPENDIX C: RESIDENT ACTION CHECKLIST

There are many things that Lethbridge residents can do to improve their personal resilience to climate impacts. This Checklist highlights individual actions that align with the City's priorities, but it is important to remember that this list is only a starting point.

Theme 1: Healthy, Safe, and Prepared Communities

- Subscribe to [City of Lethbridge social media channels](#) to stay up to date on projects.
- Check out programs hosted by local organizations and see how you can get involved

Theme 2: City Emergency Preparedness Planning

- Develop an emergency kit that has essential supplies (e.g., water, food, etc.) to help you and your loved ones survive for at least 3 days (72 hours) in the event of an emergency.
- Work with your household to set up an [emergency plan](#) so that everyone knows what to do during an emergency (e.g., evacuation plan, meet up location, etc.). This will take about 20 minutes and there are many online resources to support you.
- Know where to get updates on risks as they evolve and how to respond (e.g., federal warning systems, Lethbridge Emergency and Safety News).
- Participate in Lethbridge's annual Emergency Preparedness week (usually in May) to learn more about preparedness.

Theme 3: Healthy, Safe, and Prepared Communities

- Check on your neighbours to ensure that they are safe during extreme weather events.
- Support vulnerable neighbours by assisting in snow/ice removal to allow personal mobility and critical deliveries or pick-ups.
- Keep valuables out of the basement.
- Store propane cylinders and welding fuels outdoors in a well-ventilated area. Ensure that this area is away from ignition sources, such as open flames, electrical equipment, and heat sources.
- Store vehicles and outdoor items in the garage during extreme events.
- Use the Climate Centres during adverse conditions and advocate for services and supports required. Updates are posted in the City website.

Theme 4: Protecting Critical Infrastructure

- Install renewable energy, battery storage, and/or backup power on homes and businesses to improve grid resilience.
- Clear deadfall around homes and businesses and ensure firewood and propane tanks are not stored next to structures, to reduce fire risk.
- Clear downspouts, gutters, and catch basins to reduce flood risk.

Theme 5: Resilient Design

- Obtain home and auto insurance for extreme events.
- Install and perform regular maintenance on backup power equipment.
- Install energy-efficient windows and shades to retain and block heat.
- Install and perform regular maintenance on sump pump and backup sump pump and backup power source (in locations of high groundwater).
- Reduce risk of sanitary sewer backup by installing and regularly cleaning out backwater valve as well as disconnecting downspouts and weeping tile from the sanitary sewer system, redirecting the weepers to a sump pump and discharging the sump pump overland.
- Reduce hard surfaces such as driveways or decks.
- Move electrical and mechanical equipment/switches out of the basement (or elevate if in the basement).
- Install water-resistant basement flooring such as tile, concrete, or vinyl.
- Check floodplain/hazard mapping before purchasing a new home.
- Remove or trim existing trees that overhang houses, garages, or sheds

Theme 6: Water Stewardship

- Reduce outdoor water use by collecting and using rainwater, choosing drought-resistant plant species, and directing downspouts on your property 2 m away from your foundation and towards your vegetated areas.
- Clear gutters to ensure proper drainage.
- Take shorter showers.
- Fix leaks, including leaky toilets and faucets.
- Collect and reuse water for outdoor plant use.
- Clean outside with a broom instead of hose.
- Water sparingly in the morning or evening to reduce evaporation (when watering is allowed).

Theme 7: Transitioning Landscapes

- Plant drought-resistant trees to provide shade but keep away (10-20ft) from houses, garages, and sheds.
- Check with a professional to see if your new tree needs physical support in the early years based on the site (high wind area), the tree (bare root, loose root ball), etc.
- Deeply water trees and use mulch to retain moisture, especially during periods of drought. Proper watering of trees is critical to their health and longevity and will be essential during prolonged dry periods.
- Perform regular pruning of existing trees by removing damaged and weak branches and keeping away from houses, sheds, and garages.
- Consider xeriscaping your yard and reducing the amount of grass.

Theme 8: Protecting and Enhancing Nature

- Create a healthy and environmentally friendly yard by selecting the right plants for your garden and learning proper maintenance tips to attract pollinators.
- Maintain landscaping and/or gardens to promote biodiversity, such as keeping grass at least 2" long and leave grass cuttings/leaves on the lawn.
- Install windows with exterior screens to reduce fatal bird collisions with glass.

Other Resources

The Intact Centre on Climate Adaptation has a series of Infographics for homeowners, at:

<https://www.intactcentreclimateadaptation.ca/climate-ready-infographics/>

THREE STEPS TO COST-EFFECTIVE HOME HEAT PROTECTION

Step 1: Plan ahead to keep cool
Do-it-yourself, \$0

1. Use weatherstripping to help block drafts from windows, doors, decks and patios.
2. Seal your hot water tank and water heaters to reduce heat loss.
3. Use energy-efficient light bulbs and LEDs to reduce heat from your "heat" load.
4. Upgrade to energy-efficient doors and windows that reduce heat transfer from the "heat" load.

Step 2: Complete simple upgrades
Do-it-yourself, for under \$200

1. Plant and maintain shade trees, evergreens that retain snow and wind-blocking walls.
2. Use plants to shade your walls, and doors and windows.
3. Use your home insulation and air-sealing (e.g., draft stop).
4. Install blinds, heat-reflect curtains or film on windows.
5. Use curtains or ceiling fans to reduce heat gain in bedrooms.

Step 3: Complete more complex upgrades
Work with a contractor, for over \$200

1. Consider a cool roof to help reduce heat gain from the sun.
2. Install a new roof or replace old roof with a cool roof.
3. Shade windows with exterior shades and awnings.
4. Install windows and doors that have a Solar Heat Gain Coefficient (SHGC) less than 0.3.
5. Install and maintain a hot water tank or air conditioning unit.

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THREE STEPS TO A COST-EFFECTIVE FIRESMART HOME

Step 1: Maintain what you've got at least twice per year
Do-it-yourself, \$0 - \$200

1. Remove mulch, leaves and other debris from gutters, roof surfaces, decks and patios.
2. Remove all combustible material from the deck and patio. Use a 1.5 m clearance from the house.
3. Remove combustible material from the roof and attic. Use a 1.5 m clearance from the roof.
4. Trim the lawn to 10 cm and remove weeds and other combustible plants.
5. Prune trees to create a 2 m clearance from the ground to the lowest tree branches.

Step 2: Complete simple upgrades
Do-it-yourself, \$0 - \$200

1. Install exterior doors with fire-rated doors.
2. Add a new combustion vent pipe to the roof.
3. Create a 1.5 m clearance from the house to the roof.
4. Install non-combustible material on the roof.
5. Install non-combustible material on the roof.

Step 3: Complete more complex upgrades
Work with a contractor, \$200 - \$1000

1. Install Class 1 fire-rated exterior cladding.
2. Install non-combustible material on the roof.
3. Install fire-rated doors and windows.
4. Install all deck surfaces with fire-rated material.
5. Remove and/or fire-rate all combustible material on the roof.

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THREE STEPS TO COST-EFFECTIVE HOME FLOOD PROTECTION

Step 1: Maintain what you've got at least twice per year
Do-it-yourself, \$0

1. Remove debris from gutters, roof and downspouts.
2. Clean out eaves troughs.
3. Check for leaks in pipes, faucets and appliances.
4. Test your sump pump.
5. Clean and repair your sump pump.

Step 2: Complete simple upgrades
Do-it-yourself, for under \$200

1. Install a water tank cover to prevent rainwater from entering.
2. Elevate downspouts and sump pumps to at least 2 m from foundations.
3. Use sandbags and water barriers to prevent water from entering.
4. Remove obstructions to your pipes.
5. Install and maintain flood doors.

Step 3: Complete more complex upgrades
Work with a contractor, for over \$200

1. Install window wells that are 1.5 m above ground level and have a drainage system to direct water away from the house.
2. Elevate downspouts and sump pumps to at least 2 m from foundations.
3. Consider grading to direct water away from the house.
4. Install backwater valves.
5. Install and maintain flood doors.

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THREE WAYS TO REDUCE CLIMATE RISK WORKING WITH NATURE AT HOME

HEAT AND FLOOD PROTECTION For areas not at risk of wildfire

Complete simple upgrades
Do-it-yourself, for under \$200

1. Maintain existing shade trees.
2. Use plants to shade your walls.
3. Use your sump pump to keep your basement dry.
4. Use a sump pump to keep your basement dry.

Complete more complex upgrades
Work with a contractor, for over \$200

1. Plant new shade trees, along with evergreens that retain snow.
2. Consider pond areas to evaporate which absorbs heat and reduces water.
3. Install a sump pump to keep your basement dry.
4. Install a sump pump to keep your basement dry.

WILDFIRE PROTECTION For areas at risk of wildfire

1. Remove all combustible material from the roof and attic.
2. Remove combustible material from the roof and attic.
3. Trim the lawn to 10 cm and remove weeds and other combustible plants.
4. Prune trees to create a 2 m clearance from the ground to the lowest tree branches.

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