Climate Risk Statement

For Business Case Proponents

Climate Change and New Communities

Climate change is a global and local challenge that will increasingly impact environmental, social and built systems. The City of Calgary has a responsibility to respond to, prepare for and adapt to the impacts of climate change on Calgarians.

The changing climate poses evolving risk to all communities in Calgary, and decisions made today on how communities are designed and built have long term consequences that strongly affect a city's ability to respond to climate hazards over time. Community planning and design has a critical role to play in Calgary's response to climate change. Actions that reduce risk from climate hazards should be integrated at all urban scales from the community level down to the site and building.

Climate Risk Evaluation Through the Planning Continuum

Business case evaluations provide an opportunity to identify which climate hazards a proposed development is exposed to and what measures may reduce climate risk.

The intent of this document is to help proponents recognize and self-identify which climate hazards a proposed business case area is exposed to and what measures may reduce climate risk. This information may help inform risk reduction measures at following stages of the planning continuum (e.g. Outline Plan, Development Permit).

1. The business case area is exposed to the following six climate hazards:

☒**Extreme Heat:** Calgary will experience increasingly hot summers with heat waves occurring more often and for longer periods of time. The number of hot days with maximum temperatures above 29°C, are expected to increase from 6 annually to 28 by the 2050s, and 48 by the 2080s.

☒ **Drought:** Drought is a lack of adequate precipitation over an extended period of time, resulting in a water shortage. Climate projections of increased summer temperatures and decreased summer precipitation indicate that drought conditions may become more common and widespread.

☒ **Shifting Seasons:** Calgary will experience higher average annual temperatures in the coming decades, which affects the length of the seasons. Winters are getting shorter, spring is arriving earlier, summers are longer and fall is arriving later. Associated impacts include increased pests/disease/invasive species, misalignment of life cycle events in nature, harm to plants and wildlife, etc.

☒ **Heavy Precipitation:** Calgary will experience an upward trend in extreme precipitation events, and likely an increase in thunderstorms. We anticipate seeing significant increases in rainfall volumes during storm events, which may lead to overland flooding.

☒ **Severe Storms:** Increase in high-intensity storms is expected, which can include lightning, high winds, hail, and intense precipitation. We anticipate seeing an increase in severe storms, with these storms occurring during more months of the year.

☒ **Winter Storms:** Warmer air holds more moisture, which can lead to increased snowfall in the winter months. As winter temperatures warm up, freezing precipitation events and the occurrence of rain on snow events may increase.

2. Please identify if your business case area is exposed to the following geospatial climate hazards

☐ **River Flooding:** Climate change is expected to shift temperature and precipitations patterns which may exacerbate the conditions that lead to river flooding. River flooding events in Calgary may become more frequent. See Calgary's River Flood Map.

Check this box if any portion of your business case area situated within the pre-development 1:200 flood risk area. If so, please describe the nature of the area that is exposed (e.g. size of area, estimated population, quantity and type of built assets, size of natural assets, etc.).

☐ **Wildfire:** Climate change will make seasons drier and warmer in the future which contributes to intensifying wildfire risks. Wildfire hazard mapping is available at the city-scale to determine potential for physical exposure to urban interface wildfire.

Check this box if any portion of your business case area within 1000m of a dense, continuous forest or grassland. If so, please describe the nature of the area that is exposed (e.g. size of area, estimated population, quantity and type of built assets, size of natural assets, type of vegetation, etc.)

2. [OPTIONAL] Please explain what, if any, action is being taken to reduce risk from the above identified climate hazards to people, natural assets and/or built infrastructure within your business case area.

Note: It is understood that many climate risk reduction measures would be implemented at later stages of the planning continuum (e.g. Outline Plan, Development Permit, etc.).

Examples of potential actions (not an exhaustive list) to reduce climate-related risk might include the following, depending on your business case area:

1. ***Extreme Heat***
    a. *Protect, maintain, restore and enhance natural assets and features existing within the development area*
    b. *Incorporate tree planting and vegetated areas for heat island relief*
    c. *Include green roof structures*
    d. *Include public cooling spaces (interior and/or exterior) and drinking fountain areas along pathways and in park spaces*
    e. *Plant diverse vegetation types (grass, shrub and tree) that can cope with hot, dry conditions*
    f. *Construct structures with high-efficiency wall, roof, and window insulation*
    g. *Install passive cooling systems or air conditioning in buildings*

2. ***Drought***
    a. *Protect, maintain, restore and enhance natural features existing within the development area*
    b. *Improve the vegetation diversity and connectivity of natural assets and features within the development area*
    c. *Plant diverse vegetation types (grass, shrub and tree) that can cope with dry conditions including drought-tolerant planting plans and plant species*
    d. *Install rain barrels and/or rain gardens for holding roof runoff on individual properties*
    e. *Enhanced topsoil depth*
    f. *Construct buildings with low flow plumbing features and other water saving appliances*

3. ***Shifting Seasons***
    a. *Protect, maintain, restore and enhance natural features existing within the development area*
    b. *Improve the vegetation diversity and connectivity of natural features within the development area*
    c. *Plant diverse vegetation types (grass, shrub and tree) that can cope with changes in the onset of seasonal condition*

4. ***Heavy Precipitation***
    a. *Incorporate increasing intensity, duration, and frequency of precipitation events in stormwater management planning*
    b. *Improve on-site stormwater management using rain gardens, rain barrels and green roofs*
    c. *Protect existing wetlands, ephemeral channels and natural areas for attenuating stormwater runoff*
    d. *Increase the permeability of development area to reduce the risk of overwhelming stormwater systems; protect and create greenspaces or use semi-permeable surfaces for pavement where possible*
    e. *Design buildings to manage the risk of flooding, including elevations, grading, and below ground uses*

5. ***Severe Storms***
    a. *Use climate resilient building materials, including for cladding and roofing (e.g. avoiding vinyl siding and Class 4 roofing materials)*
    b. *Incorporate design strategies to block wind – especially prevailing winds and downdrafts, such as considering street pattern and orientation, and evergreen tree planting*

6. ***Winter Storms***
    a. *Incorporate design strategies to block wind – especially prevailing winds and downdrafts, such as considering street pattern and orientation, and evergreen tree planting*
    b. *Maximize winter sun exposure in public areas and development orientation*

c. *Include infrastructure that improves comfort and access in winter, such as breaks in frontages to provide shelter, pocket parks with south-facing exposure, boulevard sidewalks for trees and snow management*

7. ***River Flooding*** *(if applicable)*
   Please define the flood management measures that will be implemented in this area (refer to flood management practices approved by the City of Calgary Flood Team). This may include, but is not limited to:
   a. *Provision of clear community egress routes and evacuation planning measures*
   b. *Include Riparian setbacks and site development constraints*
   c. *Enhanced building standards to protect from river flooding events*

8. ***Wildfire*** *(if applicable)*
   a. *Consider potential sources of fuel for wildfire and manage their proximity in land use planning*
   b. *Plan access and evacuation routes*
   c. *Include water supplies as alternatives to municipal supply in cases of wildfire emergency, such as stormwater ponds, dugouts, storage tanks*
   d. *Use Class A rated materials for construction, such as metal, tile, fiberglass shingles.*
   e. *Incorporate spark arrestors for building chimney designs*
   f. *Use fire-resistant siding (stucco, metal, concrete) and tempered glass windows*
   g. *Use of non-combustible vegetation types close to building envelopes*