

### Environment and Climate Review

Downtown revitalization and increased population density are positive for the environment in a number of ways. Higher density development is often seen as a key strategy for urban sustainability, primarily through an efficient use of resources and infrastructure, potentially reducing residential development at the edges of the city. Benefits include:

- Land Conservation/Conversion
  - Building up instead of out minimizes urban sprawl, which preserves natural habitats, ecosystems and agricultural land on the city's fringes.
- Efficient Infrastructure and Resource Use
  - Concentrated populations reduce the per capita cost and materials needed for infrastructure like roads, water pipes, sewer lines and electrical utilities.
- Lower Emitting Transportation Options
  - Proximity of homes to public transit, amenities and bike lanes encourages walking, cycling, micromobility and public transit use.
  - This reduces reliance on individual vehicle trips, which lowers per capita greenhouse gas emissions and improves air quality.
- Energy Efficiency
  - Multi-unit buildings have a smaller exterior surface area per unit, resulting in less heat loss and lower energy consumption for heating and cooling compared to detached homes.
  - Denser areas can more effectively support district heating/cooling systems and be designed with energy-efficient building materials.

This aligns with the City Plan in the following areas.

- 1.4.1.5 Provide supports for residents, organizations and businesses to reduce energy use and greenhouse gas emissions and adapt to climate change.
- 2.4.1.3 Pursue emissions-neutral and net-positive infrastructure, buildings and neighbourhoods.
- 5.3.1.4 Prevent premature fragmentation and conversion of agricultural lands for residential and non-residential uses.

Due to the positive environmental impacts outlined above, downtown revitalization also aligns with Edmonton's Community Energy Transition

Strategy and Climate Resilient Edmonton: Adaptation Strategy and Action Plan.

### Climate Resilience

While there are many environmental and climate benefits of increased population density in downtown Edmonton, the residents in these properties will be impacted by urban heat island (UHI) effects and increasing frequency of extreme heat days due to the impacts of climate change.

A higher concentration of people, buildings and paved surfaces can trap heat, increasing ambient temperatures and increasing the ambient heat in these areas.<sup>1</sup> These warmer temperatures can magnify health impacts during heat waves. Mitigation of UHI could include planning that includes green and blue spaces (parks, water features, green roofs and gardens). However, this is unlikely to have a significant impact in densely populated areas such as downtown Edmonton.

Climate change is expected to result in higher summer temperatures and more frequent heat waves in the future. Edmonton summers are already hotter, nights are warmer and extreme heat events are longer and more frequent than annual averages, increasing cooling demands and public health risk.<sup>2</sup> Although cities may provide public cooling centres for extreme heat events, they are not adequate for those with mobility challenges, disabilities or respiratory problems.

In the Government of British Columbia's report following the extreme heat event and deaths in the summer of 2021, high indoor temperature was identified as the primary cause of injury and death.<sup>3</sup> Although public cooling centres were essential for unhoused people or outside workers, they were inadequate for indoor populations with limited mobility or disabilities. For individuals with mobility challenges and respiratory issues, movement is further impaired by extreme heat. These individuals tended to stay home during the heat event and suffered health consequences.

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<sup>1</sup> Ejiagha IR, Ahmed MR, Dewan A, Gupta A, Rangelova E, Hassan QK. Urban Warming of the Two Most Populated Cities in the Canadian Province of Alberta, and Its Influencing Factors. *Sensors (Basel)*. 2022 Apr 9;22(8):2894. doi: 10.3390/s22082894. PMID: 35458879; PMCID: PMC9032056.

<sup>2</sup> City of Edmonton, *Understanding Edmonton's Changing Climate*, June 2025.

<sup>3</sup> *Extreme Heat and Human Mortality: A Review of Heat-Related Deaths in B.C. in Summer 2021*, Report to the Chief Coroner of British Columbia, June 7, 2022.

Climate change is also likely to result in increased wildfire frequency and intensity in the future. Wildfire season is likely to coincide with extreme temperature events which impacts air quality at the same time. Cooling downtown living spaces that don't have air conditioning may become a challenge for residents as opening windows when air quality is poor will have a detrimental health impact on residents.

Climate resilience as it relates to maximum temperature of the dwelling is a particular area that is applicable for downtown housing. Any new downtown housing stock may wish to consider opportunities to mitigate these increased temperatures as its increased density and limited green and blue space will exacerbate the UHI. Some cities have implemented or are considering maximum temperature bylaws that require at least one room in a home to be able to maintain a temperature of 26 degrees or lower in the summer.<sup>4,5,6,7</sup>

While this type of regulation may not be practical in Edmonton at this time, there may be an opportunity to consider including climate resilient ranking criteria for the Downtown Attainable Housing Incentive.

The Downtown Attainable Housing Incentive does not include climate resilience criteria for qualification and does not rank qualifying applications based on any climate resilience criteria. It is recognized that much of the direction for this work is set by provincial guidelines for the CRL. If there is an opportunity to rank qualifying applications to include climate resilience features that help to mitigate UHI, this would better align with the Climate Resilient Edmonton: Adaptation Strategy and Action Plan.

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<sup>4</sup> Cloe Logan, Cities across Canada consider maximum temperature policy for rental units, Climate Solutions Reporting, National Observer, June 20th 2024.

<sup>5</sup> City of Toronto, Indoor Temperature in Apartment Units bylaws.

<sup>6</sup> Dr. Lorin Young , Robb Barnes, Young and Barnes: A new city bylaw would help prevent heat-related deaths Ottawa — and other Ontario cities — need to act urgently to set a maximum indoor temperature, Jun 07, 2025.

<sup>7</sup> Kathryn Marlow, Vancouver Island town considers bylaw to help keep rental units cool in summer, Sep 07, 2023.