

## Environment and Climate Review

### A Need to Change

This is a critical time for environmental and climate action. The Intergovernmental Panel on Climate Change (IPCC) has said that to achieve a global 1.5°C (degrees Celsius) or 2°C (degrees Celsius) carbon budget implies rapid, deep, and, in most cases, immediate greenhouse gas (GHG) emission reductions in all sectors.<sup>1</sup> As well, efforts are needed to adapt and prepare for the growing impacts of a changing climate. The IPCC has also indicated that, along with the climate crisis, ecosystems are also experiencing significant biodiversity loss and facing risks to ecological integrity and functions.<sup>2</sup> Decisions made today about how the city is designed and built will, in part, set the course for Edmonton's future climate resilience. Urban form decisions are environmental and climate decisions.

### Environment and Climate Considerations and the Growth Management Framework

The location, form, design and timing of new development has important implications for Edmonton's climate resilience goals. The Growth Management Framework interacts with the following key environment and climate areas outlined in The City Plan: i) Supporting Energy Transition and Adapting to a Changing Climate ii) Supporting Resilience of Food System; iii) Supporting Protection of Natural Areas and Green Infrastructure. For each of these areas, the table below outlines various environmental and climate risks and opportunities. The greenhouse gas impacts of the Growth Management Framework have not been quantified at this time. Work is ongoing to advance Administration's carbon accounting capabilities.

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<sup>1</sup> Intergovernmental Panel on Climate Change. *AR6 Synthesis Report: Climate Change 2023*. March 20, 2023. p. 46.

<sup>2</sup> Intergovernmental Panel on Climate Change. *Climate Change 2022: Impacts, Adaptation and Vulnerability*. February 28, 2022. p.55.

Supporting Energy Transition and Adapting to a Changing Climate	
Proposed Actions	Environment and Climate Risk/Opportunity
<p>The approach proposed includes assessment of substantial completion of developing areas within each district. For districts that contain a mix of developing and redeveloping neighbourhoods, the assessment of substantial completion only applies to the developing neighbourhoods.</p> <p>The results of tracking and forecasting of “required” metrics within developing areas would be used by Administration to recommend to Council that statutory planning of future growth areas can begin. “Required” metrics identified include: dwelling units, commercial services and parks.</p> <p>Analysis is underway to determine how metrics will be measured.</p>	<p>The identified “required” metrics do not relate directly to climate resilience, rather they encourage the development of complete communities which can provide some climate benefit in comparison to development in future growth areas.</p> <p>Inclusion of metrics for dwelling units and commercial services for developing areas can support achieving neighbourhood and district completion, which can enable reduced travel distances for private vehicles. Further, complete communities can support delivery of services, such as transit, waste collection and snow clearing, in a more efficient manner and may result in emission reductions.</p> <p>While development of complete communities in the developing area can provide some climate benefit, standards, investments and incentives that encourage compact development throughout the city can result in emission reductions and delay emissions during this critical time where solutions to deliver on carbon neutral goals are being pursued and help avoid increased future costs. Some examples include:</p> <ul style="list-style-type: none"> <li>• Phasing new infrastructure approval and construction that has associated emissions.</li> <li>• Reducing emissions through efficiencies in the delivery of City services (i.e. reduced driving distances)</li> <li>• Implementation of new technologies and standards that could support improved energy efficiency for new development. This could include updated electrical servicing requirements (e.g. supporting electric vehicle charging infrastructure and increased electrification of buildings), energy efficiency requirements for buildings and considerations for district energy.</li> <li>• Avoidance/mitigation of climate risk through increased funding for infrastructure improvements in developing and redeveloping areas rather than new infrastructure.</li> </ul>

	<p><b>Considerations for Compact Urban Form and Complete Communities</b></p> <p>The City Plan calls for transitioning to a higher density built form. Prioritization of both compact and complete communities can enable greenhouse gas emission reductions.</p> <p>Monitoring that considers planned capacity and the City Plan’s regional density targets can provide increased transparency. Further, incorporating progress of infill development in both redeveloping and developing areas into metrics could foster increasing density and could support decision making that aligns to the density goals in The City Plan.</p> <p>Potential future changes to regulations and processes within the planning and development continuum may influence the development of more compact communities. The methodology for calculating metrics for substantial completion should incorporate flexibility to include measures of compact and complete development that support climate resilient communities.</p> <p><b>Climate Resilience Considerations for Future Developing Areas</b></p> <p>Regulations requiring consideration of climate resilience in development, such as higher energy performance requirements for buildings and assessments to identify and mitigate for future risks associated with a changing climate, other than floodplain protection, are currently not in place.</p> <p>Some Canadian municipalities have adopted regulations to improve energy efficiency and other sustainable practice requirements in the design and construction of buildings. The new 2020 National Buildings Code<sup>3</sup> and National Energy Code for Buildings<sup>4</sup> includes energy efficiency performance tiers with the highest tier (Tier 5) being consistent with a net-zero energy-ready standard. The provinces and territories have jurisdiction over the adoption of codes and Government of Alberta has recently signaled the adoption of the least stringent tier (Tier 1) for the province with no published plans yet to adopt higher tiers in the future.</p>
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<sup>3</sup> Canada. National Research Council of Canada. *National Building Code 2020.* 2020.

<sup>4</sup> Canada. National Research Council of Canada. *National Energy Code of Canada for Buildings 2020.* 2020.

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	<p>Until regulations and processes are developed, adopted and implemented, the future costs required to retrofit buildings and improve infrastructure in order to meet the City's climate resilience goal will continue to increase. Solutions and financing approaches will need to be identified to deal with these issues in redeveloping and developing areas; however, the substantial costs associated with retrofitting can be managed and partially avoided if energy transition considerations are built into the planning stage of future development.</p> <p>Further, requiring information be provided on the climate resilience for future development, such as emission modeling and climate vulnerability assessments for new growth applications and at the Area Structure Plan and Neighbourhood Structure Plan levels can reduce future costs for both the City and future homeowners in these areas.</p>
<p>The proposed approach includes monitoring "tracked" metrics for the development areas that could include:</p> <ul style="list-style-type: none"> <li>● Fire halls</li> <li>● School sites</li> <li>● Mobility/Transit services</li> <li>● Libraries</li> <li>● Recreation centres, and</li> <li>● Developed parks</li> </ul>	<p>The inclusion of "tracked" metrics could inform decisions related to City investments in services and infrastructure. Tracking transit service/mobility and actioning investment in this area supports Edmonton's low-carbon goals in The City Plan and the energy transition strategy by helping reduce vehicle kilometres traveled, by increasing access to active transportation and transit.</p> <p><b>Considerations for Preparing for a Changing Climate</b></p> <p>Climate change is likely to put additional strain on aging built infrastructure systems, including transportation, buildings, water and sanitation, electricity, and information communication technology systems. The 2019 Canadian Infrastructure Report Card<sup>5</sup>, which assesses the condition of Canada's municipally-owned infrastructure, has identified that Canada's publicly owned infrastructure is at risk and will require significant attention in the coming decades. There is an opportunity for "tracked" metrics to include consideration of the state of existing infrastructure from a climate perspective and to develop a forward looking investment strategy and carbon budget that considers both energy transition and climate risks. This information could be considered alongside implications of investment in new infrastructure.</p>

<sup>5</sup> Canada Infrastructure. *Monitoring the State of Canada's Core Public Infrastructure: The Canadian Infrastructure Report Card 2019*. 2019.

Supporting Resilience of Food System	
Proposed Actions	Environment and Climate Risk/Opportunity
<p>The proposed approach includes evaluating substantial completion along with the requirement for Council to decide when planning for “future growth area” will commence.</p>	<p>Actions that contribute to The City Plan intention to support the conservation of agricultural land to reduce its loss and fragmentation also contribute positively to the resilience of the food system. Much of the future growth area is zoned for agriculture, and the Regional Agricultural Master Plan<sup>6</sup> notes that the majority of the area is “prime agricultural land.”</p> <p>The Climate Resilient Edmonton: Adaptation Strategy and Action Plan focuses on climate risks for Edmonton; however, it is recognized that climate changes could have global impacts on food systems. While further study is required to understand what these impacts could mean for the Edmonton region, having a reliable and secure food system contributes to our resilience to a changing climate.</p>
Supporting Protection of Natural Areas and Green Infrastructure	
Proposed Actions	Environment and Climate Risk/Opportunity
<p>The proposed approach includes evaluating substantial completion along with the requirement for Council to decide when planning for “future growth area” will commence.</p>	<p>Development of land at the urban edge consumes and alters natural assets, such as grasslands, forests and water bodies. These assets typically help mitigate impacts from high rainfall events, reduce urban heat island effect, increase biodiversity, maintain water quality, and offer other risk-reducing services. The proposed approach for substantial completion thresholds do not currently incorporate consideration of the carbon sequestration benefits or resilience provided by these areas.</p> <p><b>Environment and Climate Risk/Opportunity:</b> Edmonton’s Community Energy Transition Strategy estimates that approximately 17 per cent of emissions reductions required will need to come from carbon capture and carbon sequestration by nature-based solutions. Additionally, healthy ecological functioning can help adapt to a changing climate by providing important services, such as stormwater management, water and air quality improvements, reduction of urban heat island and others. These important nature-based solutions will require</p>

<sup>6</sup> Edmonton Metropolitan Regional Board. *Regional Agricultural Master Plan*. 2021.

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	<p>conservation and restoration in order to contribute to climate goals.</p> <p>Tools, such as a conservation overlay, natural assets valuation, and metrics on potential loss of natural assets could help inform decisions related to development.</p>
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