Attachment 5

Environment and Climate Review

The City Plan sets intentions and directions on how Edmonton grows, including how to revitalize neighborhoods to achieve both climate resilience and become a low carbon future city. The planning, designing and building of publicly owned land to achieve livability, accessibility and vibrancy, must align with the need to achieve climate resilience and low carbon intentions and directions of The City Plan. The development and delivery of essential services like transportation and housing will also support The City Plan vision

The Old Strathcona Public Realm Strategy (hereby referred to as the Public Realm Strategy) is forward-looking with seven key actions to align with The City Plan. It supports the opportunities for local economy and community resilience through development, revitalization and renewal. There remains some environmental and climate opportunities for a few of these key actions to consider as the Public Realm Strategy undergoes its final iteration and preparation towards implementation. Three areas for environment and climate considerations are:

i) Parking lot repurposing initiatives.

ii) Provision of green networks.

iii) Mobility/bus-based mass transportation.

Parking Lot Repurposing Initiatives

Spatial planning and the built environment are central to urban climate resilience as they influence how people live, work and play within their surroundings, which in return can shift the urban growth pattern. Spatial planning, as both a practice and policy tool, can facilitate options to increase climate resilience for land use, housing and mobility; and enable low carbon energy transition, while also allowing incremental adaptation to climate risks when low impact development practices are employed. Repurposing the surface parking lots provides opportunities to reimagine climate resilient developments options for the next designated uses.

To better align with The City Plan, the use of the carbon budgeting process to assess and create emission profiles for both the neighborhood level developments, and the recommended public realm improvements should be considered. Considerations on density targets within the redevelopment areas can influence further how non-residential development contributes to shifting the urban growth pattern. Both

these considerations can demonstrate how to reduce emission and enhance climate resilience.	
Related Action	**Environment and Climate Risks/Opportunities**
Low-carbon future City	The transformation of the built environment through sustainable spatial planning approaches can create climate resilient neighborhoods and public realm.[1,2] The Public Realm Strategy has aspired to create a low carbon city area, and has put forward recommendations to convert surface parking lots over time to create active transportation pathways, increase open space, improve biodiversity through creation of new greenways and improvements at existing parks, and incorporate mixed-market development to support greater housing options in the area. **Consideration for profiling emissions from the neighborhoods and the public realm improvements:** The City's carbon accounting framework is used to estimate emissions or needed reductions from projects, programs, initiatives or operating processes; and to incorporate these estimates into initial proposals, ongoing status reporting, and project completion reports as part of the carbon budget. By applying this framework, emissions can be qualitatively estimated for neighborhood-level developments and other aspects of improvements recommended in the Public Realm Strategy. This approach substantiates how the provided recommendations in the Public Realm Strategy contribute to community energy transition, and emission reduction targets described in the Community Energy Transition Strategy. It will also help to identify where to redirect efforts to further fill emissions

[1] Welegedara, N. P., Agrawal, S. K., Gajjar, S., & Joshi, N. (2021). Variations in direct greenhouse gas emissions across neighborhoods: A case of Edmonton in Canada. *Environmental Challenges*, *5*, 100312.
[2] Pulselli, R. M., et al. (2019). Carbon accounting framework for decarbonisation of European city neighbourhoods. *Journal of cleaner production*, *208*, 850-868.

	reduction gaps during the implementation stage, and therefore demonstrate how the City continues to enable transformational climate actions at various scales to achieve climate resilience.
Mixed-market development	Building design can reduce the vulnerability of the built environment to climate risks through the building location and configurations, the structural design and building techniques, materials used, and other climate-resilient considerations.[3] Research from 2021 indicated that in Edmonton, all buildings consumed 42 per cent of the city's total energy, contributing 39 per cent to the total emissions.[1] The Public Realm Strategy has noted that surface parking lot repurposing initiatives will include mixed market development, and that the new building construction will help meet emissions reduction targets through relevant building design to enable energy transition to low carbon options, and that these new buildings are intended to be resilient to climate risks. **Consideration for density targets through complete community concept:** How people live and where they work/play has importance in reducing emissions both in the near and longer term futures. Recognizing the interrelationship among density, neighborhood configurations and generation of emissions from buildings is important given that neighborhood level developments play a critical role in attaining a low-carbon city.[1,2] Under the Public Realm Strategy, the non-residential developments could further influence needed density by emphasizing and promoting the creation of complete communities within districts as the City grows towards 1.25 million people and beyond. The parking lot repurposing

[3] United Nations Environment Programme. (2021). A Practical Guide to Climate-resilient Buildings and Communities. Accessed on May 16, 2024 from https://wedocs.unep.org/handle/20.500.11822/36405

	initiatives considers the goal of having higher densities and amenities for community needs under actions 4 and 5. Additional assessment could be conducted to determine how the projected densities from the proposed mix market developments align with the City's Growth Management Framework targets.
Provision of Green Networks Open Space Policy C954 focuses on ecology, celebration and wellness as themes that define the environmental and social benefits of the green networks. Within the Public Realm Strategy, opportunities exist to diversify open space and park uses to further incorporate Indigenous heritage and traditional knowledge, foster ecological connectivity, and manage potential human-wildlife interactions to meet the future needs.	
Related Action	**Environment and Climate Risks/Opportunities**
Uses of district parks and other parks	The Public Realm Strategy draws on *Breathe* to inform the improvements to existing open spaces and the provision of new ones. An open space assessment identified 15 parks. Open space programming, classification, priority functions, and intent were identified for all existing and proposed open spaces to provide strategic directions for future implementation. These strategic directions have been incorporated into the Public Realm Strategy's recommendations. **Considerations for Indigenous heritage to improve livability, adaptability and accessibility of all parks:** One of the measures for open space provision identified in *Breathe* is diversity. This measure assesses the provision of a range of different open spaces and functions within the landscape. However, this measure is difficult to attain in mature and existing

	neighborhoods due to the need to continue supporting future intensification.[4] The City Plan advocates for animating spaces at all scales through programming and activities that include Indigenous cultural and ceremonial practices to honor, recognize and respect the founding relationships with First Peoples. Under the Public Realm Strategy, opportunity exists for parks other than End of Steel Park to be designed to include Indigenous cultural and ceremonial practice needs. Doing so will improve equitable access to parks as gathering spaces for both formal and informal uses by Indigenous Peoples in addition to serving residents of Old Strathcona. Additional research and public engagement on the intersection between park uses can improve the approach to park planning, designing and future park management. **Considerations of multifaceted parks uses to guide future implementation plan:** The Public Realm Strategy has considered the uses of urban parks and other forms of green networks that align with general needs for socialization and well being of residents and visitors alike. Research elsewhere in Canada has recognized that uses of urban parks and other green spaces that allow encounters, especially during the post-COVID-19 era, have evolved to include many types of users and uses that are multifaceted, resulting in a need to better manage their interactions, and the health of the natural systems within the parks.[5]

[4] City of Edmonton. (August 2017). Breathe: Edmonton's Green Network Strategy - Part 3 - Providing Open Space. Accessed on May 2024 from: https://www.edmonton.ca/sites/default/files/public-files/assets/PDF/Breathe_StrategicPlan_2017_Part3_ProvidingOpenSpace.pdf

[5] School of Cities. (2023). City Research Insights: Urban Parks are for the City. Accessed on May 2, 2024 from: https://schoolofcities.utoronto.ca/research/volume-2-issue-4-urban-parks-parks-are-for-the-city/

	Thoughtful considerations of multifaceted park uses in the Public Realm Strategy can further help revise the park design to avoid contentious encounters of multiple park users, and advance equitable accessibility for all residents. The management of natural systems within the parks will also need to be evaluated to suit such multi-uses. Further research and engagement in support of such considerations can help facilitate policy development and resource allocation for the management of these spaces during the implementation phase.
Ecological connectivity	Greenways are places where people and nature interact. These places become important ecologically to support ecosystem services, provision of wildlife habitat, and regulation of urban heat island effect due to climate change. The Gateway Boulevard and the Rail Trail corridor were identified as future greenways for increased vegetative covers and ecological connection to the North Saskatchewan River Valley. **Consideration for human and wildlife interactions:** The City Plan promotes the conservation and restoration of natural systems to improve ecological connectivity and reduce habitat fragmentation (See The City Plan Map 4 at 2 Million). As identified in Policy C594, the aim of ecological connectivity at multiple spatial scales (from the neighborhood level, to the City level and eventually forming linkages with the surrounding region) is to improve the quality and function of habitat within The City Plan's Green and Blue Network. Dedicated City resources exist, and new studies are being carried out to improve biodiversity management in natural and naturalized areas.[6] Research on urban parks and green

[6] City of Edmonton. Edmonton's Natural Area Parks. Accessed on June 4, 2024 from: https://www.edmonton.ca/city_government/environmental_stewardship/natural-area-parks

	spaces elsewhere in Canada has demonstrated that when contiguous ecological connectivity is enhanced due to a wide variety of plants and animals, human-wildlife interactions become a concern, with potential negative effects (i.e. coyote attacks, deer-vehicle collisions, among others).[5] Since the Public Realm Strategy has noted ecological connectivity as an important function to achieve, opportunity exists to consider how additional parks and open spaces will be designed and managed with thoughtful considerations to mitigate potential negative human-wildlife interactions.
Mobility/Bus-based Mass Transportation Population growth, ongoing redevelopment, and investment in mass transit are important drivers for public realm improvements. One of the three city-wide bus rapid transit (BRT) routes will be located along Whyte Avenue to meet the mobility needs of Edmontonians at the population horizon of 1.25 million people. While the Public Realm Strategy aligns with the planned BRT, there are other opportunities to enhance climate resilient infrastructure and promote low carbon transportation. Two potential considerations include electric vehicle charging infrastructure and the design of bus shelters for climate adaptation as a continuation of greenways.	
Related Action	**Environment and Climate Risks/Opportunities**
Alignment of the public realm infrastructure needs with the BRT.	Edmonton's mobility networks allow people and goods to move efficiently, accessibly and safely. The network includes transit (buses and LRT), active transportation (cycling, walking and rolling) and roadway and goods movement (vehicles and trucks).[7] Dedicated research, public engagement, and technical analysis for mass transit and the Public Realm Strategy has considered many synergies between the two for alignment with The City Plan's goal of emissions reduction.

[7] City of Edmonton. What is a Mobility System? Accessed on May 3, 2024 from: https://www.edmonton.ca/city_government/city_vision_and_strategic_plan/mobility-system

	The recommended improvements in the Public Realm Strategy have considered the liveability and vibrancy of the Whyte Avenue corridor (e.g. streets, alleyways and sidewalks), the location of potential BRT stops, and the promotion of alternatives to driving. This will contribute to reduced emissions from transportation options and ensure the corridor follows a low emissions development pattern. **Considerations for supporting a low emission mobility network:** As part of future parking analysis and parking management tools, opportunities exist to consider electric vehicle (EV) charging infrastructure. Research in other large Canadian urban municipalities has indicated that the provision of easily accessible EV infrastructure to speed up the adoption of EV will reduce emissions in the transportation sector immensely.[8] Having EV charging infrastructure located conveniently close to the corridor can help Old Strathcona become a low carbon place[9] within the city through the reduced travel of combustion engine vehicles. Encouraging multimodal hubs can also support a low emission mobility network. Bringing multiple travel modes together in one place (e.g. transit, cycling, and shared ride services etc) that allows people to seamlessly move from one mode to another will encourage Edmontonians to consider alternatives to single occupancy vehicle trips.
Naturalization of the primary corridor along the BRT.	The design of open spaces can be optimized to include solutions for climate change impacts and improve the environmental health of residents and visitors. The

[8]Cappell, E., et al. (2022). The Municipal Role in Climate Policy. Who Does What Series. Institute on Municipal Finance and Governance (IMFG), School of Cities, University of Toronto. Toronto: ON.
[9]Serkin, C. (2024). Climate Zoning. Notre Dame Law Review, Volume 99(3),1093. Access on May 21, 2024 from: https://scholarship.law.nd.edu/ndlr/vol99/iss3/5

	Public Realm Strategy has identified nature-based solutions within this corridor as a means for tackling climate impacts with the addition of vegetation, landscaping, trees, native species and low impact developments. The needs of transit users, such as the provision of shaded areas along Whyte Avenue, have also been identified. **Consideration for bus shelter design for climate adaptation:** The City Plan envisions the prioritization of green infrastructure and policy C594 identifies green roofs as components of greenways. Green roofs have proven to be important within the built environments especially as they increase habitat for wildlife, improve air quality, mitigate storm water run off from above building surfaces by collecting and retaining the precipitation, and for minimizing heat island effects.[10] The public realm provides opportunities to transform and reimagine the built environment to achieve future climate resilience. Addition of more green infrastructure in the planning phase may help enable policy development and allocation of resources for the implementation phase. To support this consideration, research, demonstration projects, and public engagement may be required.

[10] Oberndorfer et al. (2007). Green Roofs as Urban Ecosystems: Ecological Structures, Functions, and Services. *BioScience*. *Volume 57(10)*, 823–833. https://doi.org/10.1641/B571005

Attachment 5