Environment and Climate Review

The Neighbourhood Renewal Program (NRP) has a variety of aspects that have climate and environmental benefits.

These include:

- reduced greenhouse gas (GHG) emissions by supporting active transportation options such as biking and walking;
- carbon sequestration, flood mitigation, mitigation of urban heat island effects, and biodiversity benefits through tree planting and naturalization of areas, including narrowing of roads to create new boulevards;
- flood mitigation and carbon sequestration supported by low impact development; and
- energy efficiency gains, and reduction of light pollution and light trespass through changing high pressure sodium lighting to LED lighting.

Delaying the implementation of a portion of the NRP projects will delay actions that have climate benefits and therefore make it more difficult to achieve the City's climate resilience goals. It will also mean less support for the City's ecosystem and biodiversity goals.

The links between the NRP, the City's climate resilience and biodiversity goals, and the related risks and opportunities are outlined below.

GHG Emissions Reductions	
Should alternative projects be undertaken instead of NRP projects, consider the carbon budget implications of those projects to try to align with the City's carbon budget.	Actions in the NRP that have a GHG reduction benefit, supporting the City's GHG reduction goals. These include: the construction of shared pathways and bike infrastructure to allow for active transportation; nature-based solutions projects such as tree planting and naturalized areas that sequester and store carbon; and installation of energy efficient lighting that reduces energy use. The cooling effect of trees can also reduce the energy required for air conditioning during hot summer days, further reducing energy usage.[1] The active transportation options and network created through

[1] Arbor Day Foundation, Tree Facts

	neighbourhood renewal can create positive environmental outcomes such as a reduction in local air pollution, energy usage, and greenhouse gasses.[2] Delaying NRP rollout could have a negative impact on achieving the City's corporate carbon budget and reaching community GHG reduction goals as outlined in C627 Climate Resilience Policy.[3] While the GHG impacts of the NRP have not been quantified, these actions are well understood and recognized as contributing to Edmonton's Community Energy Transition Strategy and Action Plan.[4] Delaying climate action will have a compounding effect because delays in the short-term means that CO2 will continue to be emitted and even more intensive carbon reductions activities must make up this difference in the future in order to achieve GHG reduction goals.
Climate Adaptation	
Should alternative projects be undertaken instead of NRP projects, consider the climate resilience aspects of those projects (whether it be flood mitigation, heat island effect or other climate adaptation measures) in order to prepare for expected climate impacts.	There are a number of activities in the NRP that support climate adaptation. Delaying these actions could result in less flood mitigation and climate resilience for city residents. Increased flooding events is one of the expected impacts of climate change.[5] The NRP includes installation of features that support flood mitigation such as Low Impact Development and increased surface permeability through more naturalized areas. Low Impact Development can help to reduce localized flooding by incorporating plants, engineered soils and natural processes to capture stormwater runoff close to its source.[6] An increase in naturalized areas where there is a narrowing of roads to reduce asphalt and increase green space and boulevard trees also supports improved drainage and flood mitigation. Urban heat island effect occurs in cities where tightly packed buildings and paved surfaces like roads trap and re-emit the sun's heat back into the air, which can cause higher temperatures

[2] Government of Canada, National Active Transportation Strategy 2021-2026.
[3] City of Edmonton, C627 Climate Resilience Policy
[4] Edmonton's Community Energy Transition Strategy and Action Plan
[5] Edmonton's Community Energy Transition Strategy and Action Plan
[6] EPCOR, LID in Edmonton

	in the city compared to surrounding rural areas.[7] This effect will be more pronounced as the planet warms. Planting trees and protecting and restoring naturalized areas have a cooling effect which tempers the urban heat island effect. Therefore, delaying tree planting and naturalization of areas in the NRP will also delay the implementation of a climate resilience opportunity.
Biodiversity and Ecosystem Health	
Should alternative projects be undertaken instead of NRP projects, consider including criteria that support biodiversity and ecosystem health.	Edmonton's Community Energy Transition Strategy and Action plan speaks to maintaining healthy ecosystems as part of a healthy and resilient city, indicating that the City will preserve, conserve, and foster wellbeing of the environment. Along with a climate crisis, the world is experiencing a biodiversity crisis, driven by human caused land use change and a changing climate.[8,9] The amount of urban green space in cities is an important determinant of biodiversity. Maintaining habitat and landscape connectivity enhances biodiversity in fragmented urban areas.[10,11] The NRP supports biodiversity by adding trees and naturalized areas to neighbourhoods. These areas provide habitat for flora and fauna and can serve as urban wildlife corridors to maintain or enhance biodiversity, and a healthy local ecosystem.

The Neighbourhood Renewal Program has direct links to several parts of the City Plan, Edmonton's Climate Resilience Policy (C627), and Edmonton's Community Energy Transition Strategy and Action Plan.

[7] The Canadian Encyclopedia, Urban Heat Island Effect
[8] Pörtner, H.-O., et. al. (2021). Scientific outcome of the IPBES-IPCC co-sponsored workshop on biodiversity and climate change (Version 5). Zenodo.
[9] Syed Amir Manzoor, Geoffrey Griffiths, Martin Lukac, Land use and climate change interaction triggers contrasting trajectories of biological invasion, Ecological Indicators, Volume 120, 2021, 106936, ISSN 1470-160X.
[10] Christopher A. Lepczyk, et. al, Biodiversity in the City: Fundamental Questions for Understanding the Ecology of Urban Green Spaces for Biodiversity Conservation, BioScience, Volume 67, Issue 9, September 2017, Pages 799–807.
[11] Zhao X, Li F, Yan Y, Zhang Q. Biodiversity in Urban Green Space: A Bibliometric Review on the Current Research Field and Its Prospects. Int J Environ Res Public Health. 2022 Oct 1;19(19):12544. doi: 10.3390/ijerph191912544. PMID: 36231864; PMCID: PMC9566254.

Key Links to City Plan

2.2.1.1 Design and retrofit street layouts to facilitate intensification and ongoing adaptability.
2.4.1.2 Conserve, restore and reconnect natural areas and ecological networks within the built environment for human and ecosystem health.
2.4.2.6 Prioritize and enable green infrastructure including low impact development solutions.
4.4.1.1 Encourage a shift to transit and active transportation options.
5.1.2.2 Expand and diversify Edmonton's urban tree canopy and native vegetation.
5.4.1.1 Manage stormwater runoff and improve water quality through the design and development of the built environment.
5.4.1.2 Improve flood resilience through ongoing risk management, infrastructure planning and operation, financial analysis and stakeholder engagement.

Key Links to Edmonton's Climate Resilience Policy (C627) Commitments

1b. Low Carbon City and Transportation - Planning, developing and building Edmonton to have carbon neutral and climate resilient communities and zero emissions transportation systems.
2c. Climate resilient, adapted and healthy ecosystems - Investing in and protecting ecosystems to build resilience, protect communities, enhance environmental connection, and support and improve quality of life.

Key Links to Edmonton's Community Energy Transition Strategy and Action Plan

Strategy 5: Support new collaborations with utilities, alternative energy suppliers, post-secondary institutions, businesses and regional partners to advance the low carbon energy market and industries.
Strategy 14: Ensure sustainable urban planning practices to become a carbon neutral city.
Strategy 17: Ensure a safe, accessible, and comfortable active transportation system that enhances walking and cycling.
Strategy 20: Support the changing transportation needs of a low carbon city.
Strategy 23: Promote Investment in natural carbon storage and sinks such as tree planting, ecosystem conservation and restoration
Strategy 24: Promote the acceleration of nature based solutions to achieve climate resilience goals.