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**City of Waterloo and University of Waterloo Collaborative Partnership Potential Projects - August 2023**

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**Background**

To build on the many decades of collaboration between the University of Waterloo (UW) and City of Waterloo (City); and, to leverage the research funding and capability of UW to advance overarching community goals for environmental sustainability and climate change mitigation/adaptation, a “connector event” is planned for October 24, 2023. That event will provide a valuable networking opportunity to exchange ideas on potential projects of mutual interest to UW and the City. This document outlines initial ideas for such projects along with certain research problems and questions that could be explored. The projects are themed under the broad headings of 1) New Building Construction and Building Retrofits; 2) Transportation; and, 3) Community Greening.

**1) New Building Construction and Building Retrofits**

**Context:** The provincial government has mandated housing unit targets for municipalities across the province and 1.5 million homes to be built in 10 years. Waterloo’s target is 16,000 new housing units and currently we have approximately 22,000 housing units at some point in the development pipeline. In addition, there are existing housing units being retrofitted to enable more units to be created. There are significant numbers of housing units currently underway or which could start in 2023 when the market conditions (i.e. inflation, labour and material costs and employment) settles. In the City of Waterloo, most of these new housing units will be in the form of tall multi-storey high rise buildings (i.e. condominiums) that will require carefully planned sites with amenities, access to transit, services, schools, parks and municipal recreation facilities. The City owns and operates several hockey arenas, community centres, and has other buildings in its portfolio that are energy intensive (e.g. Service Centre/Fleet Operations building, libraries, offices). Additions and renovations of existing municipal buildings have addressed leading energy efficiency standards; however, several facilities pre-date such modern standards and are more carbon intensive. The City’s 2019 Energy Conservation and Demand Management Plan addresses emissions from city-owned assets and through functions, which include community and staff use of buildings, fleet, equipment, wastewater management treatment, outdoor lighting, solid waste and business travel.

**Potential Projects/Questions**

* There is an opportunity to conduct comprehensive analysis of the impact tall residential buildings will have on the built form of the City including, GHG impacts, wind, shadow effects, HVAC noise, light pollution, quality of life, automobile parking, and demand on the City/Regional transportation network.
* Will the proliferation of tall residential buildings (i.e. greater than 25 storeys) in Waterloo result in unforeseen environmental impacts or quality of life considerations?
* How can existing City-owned facilities (i.e. recreation/community centres, operations buildings, libraries) be renovated or retrofitted to achieve deep energy and GHG savings using advanced building materials and energy-saving technology?

**Transportation**

**Context:** Overall, there is a goal to reduce the carbon footprint created by short automobile trips around Waterloo and within Waterloo Region. Public transit (ION and GRT bus networks) and active transportation links are continuing to improve. Electric scooters, electric and pedal bikes could be multi-modal game changers. Safe, active transportation for pedestrians, people with assistive devices (e.g. wheelchairs, walkers, canes) is imperative. The City’s 2020 Transportation Master Plan speaks to increased road safety, complete street road designs, connected pathways and greenspaces, reducing an oversupply of automobile parking and various other objectives. Collaboration on transportation projects would involve, where appropriate, the Region of Waterloo.

**Potential Projects/Questions**

* Examine data from the “Neuron” micro-mobility pilot for e-bikes and e-scooters to assess the effectiveness of micro-mobility as an environmentally friendly alternative to other forms of transportation; and, potential for expansion beyond the current limits of the pilot. Based on the experiences of other North American Cities that have been early adopters of micro-mobility technology, what positive and negative outcomes should the City expect from a wider expansion of such technology?
* Can computer simulations and artificial intelligence be used in the City of Waterloo to advance its Transportation Master Plan “Vision Zero” goals for no serious traffic injuries/fatalities arising from the use of City sidewalks, roads, and multi-use paths?
* What leading research tools and techniques can be used to assess optimal automobile parking levels and EV charging stations as the City intensifies residential land use? That assessment would include key agencies and utility service providers such as Enova and Grand River Energy as project partners.

**Community Greening**

**Context:** The City of Waterloo has 134 parks consisting of over 407 hectares of property. There are several hundred additional locations designated as environmentally sensitive protected areas (ESPAs), forests, wetlands and well head protection areas (WHPAs). In addition to many private green spaces across Waterloo, there is an undeveloped land base that provides vital area for ecological sustainability, as well as community recreation. The City’s 2022 Parkland Strategy outlines the vision for its parkland, including a number of proactive recommendations. A key recommendation related to climate change is the need for the development and redevelopment of City parks to incorporate design measures that include slowing stormwater runoff, controlling invasive species, and selecting native plant materials to support a healthy urban canopy. There is an opportunity to assess how parks and green spaces can be enhanced for long-term ecological sustainability (e.g. birds, bees, insects, etc.) which supports access to, or the growing of, local food for private or public use. The City of Waterloo has a Neighbourhood Strategy which includes a mini-grant and grant partnership programs, as well as some other community building initiatives particularly geared to Neighbourhood Associations and Home Associations for greenspace beautification.

**Potential Projects/Questions**

* How can the City’s tree canopy be increased in parks and open spaces to address urban heat island effects; to sequester carbon; and, to enhance stormwater management?
* In certain parks and stormwater management ponds across the City, the invasive colonization of waterfowl is degrading water quality and creating a nutrient imbalance within ponds and watercourses (e.g. Silver Lake in Waterloo Park). What ecologically sound methods and strategies could be harnessed to reduce waterfowl populations at locations such as Silver Lake?
* Based on international and North American experiences where urban and suburban parkland has been adopted for climate resilience, what would a comprehensive natural areas management plan look like for the City of Waterloo’s park inventory?