

Bill No. 175
2022

By-law No. A.-

A by-law to authorize and approve a Memorandum of Understanding between University of Western Ontario and The Corporation of the City of London and to authorize the Mayor and the City Clerk to execute the Memorandum of Understanding.

WHEREAS section 5(3) of the *Municipal Act, 2001*, S.O. 2001, c. 25, as amended, provides that a municipal power shall be exercised by by-law;

AND WHEREAS section 9 of the *Municipal Act, 2001*, S.O. 2001, c. 25, as amended, provides that a municipality has the capacity, rights, powers and privileges of a natural person for the purpose of exercising its authority under this or any other Act;

AND WHEREAS it is deemed appropriate for The Corporation of the City of London (the "City") to enter into a Memorandum of Understanding with the University of Western Ontario ("Western") to undertake collaborative work in the areas of energy efficiency, energy conservation, energy literacy, climate change mitigation, climate change adaptation, community engagement, technology development, testing and commercialization, and understanding the impacts of severe weather locally and regionally;

AND WHEREAS it is deemed appropriate to authorize the Mayor and the City Clerk to execute the Memorandum of Understanding on behalf of the City;

NOW THEREFORE the Municipal Council of The Corporation of the City of London enacts as follows:

1. The Memorandum of Understanding between The Corporation of the City of London and the University of Western Ontario, attached as Schedule A to this by-law, is hereby authorized and approved.
2. The Mayor and the City Clerk are hereby authorized to execute the Memorandum of Understanding authorized and approved under section 1 of this by-law.
3. This by-law shall come into force and effect on the day it is passed.

PASSED in Open Council _____, 2022

Ed Holder
Mayor

Michael Schulthess
City Clerk

First Reading – April 12, 2022
Second Reading – April 12, 2022
Third Reading – April 12, 2022

Schedule A

Memorandum of Understanding

Between

The Corporation of the City of London (“City”)

And

The University of Western Ontario (“Western”)

Whereas the Council of the Corporation of the City of London declared a climate emergency on April 23, 2019 for the purposes of naming, framing, and deepening our commitment to protecting our economy, our eco systems, and our community from climate change;

Whereas Council directed Civic Administration to develop with the community a Climate Emergency Action Plan to build on years of collaborative work in the areas of energy efficiency, energy conservation, energy literacy, climate change mitigation, climate change adaptation, community engagement, technology development, testing and commercialization, and understanding the impacts of severe weather locally and regionally;

Whereas the City wishes to examine, support, conduct research and/or implement projects under the broad classification(s) of climate change mitigation and climate change adaptation in London, or in collaboration with others outside of London, as part of continuous learning, implementation, and improvement methodologies;

Whereas the City wishes to pursue projects, relationships, and partnerships for the purposes of innovation, creativity, best practices, and excellence in climate change mitigation and adaptation as part of the implementation of the Climate Emergency Action Plan;

Whereas the City has several established and ongoing relationships and projects with individual faculties and research institutes such as the Institute for Chemicals and Fuels from Alternative Resources (ICFAR), Human Environments Analysis Laboratory (HEAL), Centre for Environment and Sustainability, and Western Water Centre (WWC);

Whereas Western has a broad range of demonstrated expertise in the areas of climate change mitigation and adaptation;

Whereas Western has identified Carbon Reduction, Climate Change, Green Energy, Circular Economy and Environmental Sustainability as areas of research strength, knowledge transfer, and implementation through on-the-ground projects and programs; and

Whereas through Western’s interdisciplinary approach to research, academic learning and student innovation and creativity, and now wants to further extend its relationship with the City for mutual interests.

1.0 Purpose of the Memorandum

This Memorandum of Understanding (“MoU”) is intended to set out the mutual intentions of the City and Western to advance their joint climate change mitigation and adaptation objectives. The MoU is based upon the mutual understanding that the combined expertise, influence, and commitment of the parties are better applied together to support their common goals. The MoU establishes the non-legally binding framework and set of principles for enhanced and focused coordination and collaboration to support their shared interests in climate change mitigation and adaptation.

The parties to this MoU acknowledge that if they wish to jointly carry out specific initiatives that may arise out of this MoU, they will have to engage in further discussion and prepare necessary agreements to define, authorize and execute, among other things, each party's roles and responsibilities, resource allocation and other details.

The MoU is not an exclusive arrangement and does not restrict either party from pursuing their mandates either on their own or in collaboration with any other party.

2.0 Short-Term Objective

The short-term objective of the collaboration between the City and Western is to:

- Build on the existing foundation of traditional and innovative projects to mitigate and/or adapt to climate change;
- Create a focal point (centre or centres) for the ongoing examination of practical and innovative solutions for energy efficiency, energy conservation, energy literacy, climate change mitigation, climate change adaptation, community engagement, technology development, testing and commercialization, and understanding the impacts of severe weather locally and regionally;
- Develop a list of research and project areas that would benefit from direct involvement of Western staff, faculty and students (working title is Academic Agenda for Action on Climate Change) and contribute to the implementation of the Climate Emergency Action Plan;
- Establish partnerships and collaborations between government, academia, and businesses to synergistically build on existing strengths to create opportunities to reduce greenhouse gas emissions and/or to build a more resilient London and region; and
- Be known as an innovative centre of excellence with shared facilities and resources providing leadership, implementing best practices, undertaking leading edge research, providing knowledge and support to industry, while educating and training students, researchers, and postdoctoral fellows in the various fields of climate change mitigation and adaptation.

3.0 General Arrangement

This MoU sets out the General Arrangement between the parties that will be the basis for working together.

The responsibilities of the City are to include:

- Share climate change mitigation and adaptation knowledge and expertise with Western and other partners,
- Assist with funding applications and discussions/negotiations with potential partners,
- Provide access to relevant City facilities, following established protocols, such as Material Recovery Facility (MRF), Greenway Wastewater Treatment facility, W12A Landfill Site, facilities with energy efficient equipment installed, other City facilities,
- Participate in project development, design, and/or implementation,
- Participate, when available, in discussions, tours and related activities,
- Provide climate change mitigation and adaptation materials, in appropriate quantities, to assist with knowledge transfer,
- Participate and/or make available resources to assist with student research,
- Assist with reporting, being available for media interviews and related matters, and
- Keep London Municipal Council informed of progress.

The responsibilities of Western are to include:

- Carry out research and development projects supported by grants and contracts which generate knowledge, expertise and trained personnel with a focus on climate change mitigation and adaptation;
- Share climate change mitigation and adaptation expertise with the City and with the industry partners;
- Contribute to the implementation of the Climate Emergency Action Plan;
- Act as window of access of academic expertise on behalf of the Western community for the City, government agencies, and potential industry partners bringing together the appropriate teams from across Western aiming at maximizing synergies of expertise, infrastructure and resources; and
- Proactively engage in conversations with the City and with industry partners to ensure continuous review and improvement of current initiatives and development of new projects.

4.0 Formal Agreement

The parties agree to work together to develop a Formal Agreement to undertake activities that involve capital works, contracts with funding agencies, contracts with private companies and investors.

5.0 Effective Date and Duration

This MoU will come into effect upon the date it has been signed by all parties and will remain in effect until December 31, 2026. This MoU will be reviewed two months prior to each anniversary date and minor amendments may be made on consent of the parties, which may be provided on behalf of the City by the City's _____, or designate and on behalf of Western by _____, or designate.

Either party may withdraw from this MoU by providing sixty (60) days' written notice to the other party. Notice may be provided to the parties as follows:

- The City: _____
- Western: _____

A party may withdraw from this MoU by providing a sixty (60) day written notice to the other parties.

This MoU is subject to approval processes required by each of the parties.

DATED this _____ day of _____.

IN WITNESS WHEREOF:

THE CORPORATION OF THE CITY OF LONDON

By:

Name: Ed Holder
Title: Mayor

By:

Name: Michael Schulthess
Title: City Clerk

I/We have authority to bind the City.

THE UNIVERSITY OF WESTERN ONTARIO

By:

Name: _____

Title: _____ The University of Western Ontario

Acknowledgement:

By:

Name: _____

Title: _____

I/We have authority to bind Western.

Appendix D

Preliminary Costs and Benefits of Household Climate Actions

Moving ahead with any of the household actions presented in Section 9.3 of the CEAP will require varying amounts time and expertise to plan and implement. Knowledge of costs and savings will be key. While every household is unique and the financial, time and expertise requirements to take on most climate actions can vary significantly based on many factors, the following preliminary cost estimates and associated cost-saving benefits have been compiled based on available information and assumptions identified. These estimates are provided to help build a foundation of information to assist Londoners in understanding the potential magnitude of costs and efforts required for some of the climate actions presented in the CEAP. The specific requirements for any household may vary significantly.

Transportation and Mobility

For households considering electric vehicles, the Ontario-based non-profit organization [Plug'n Drive](#) provides an on-line calculator to estimate the costs and savings associated with all electric vehicle models compared to a gasoline-fueled vehicle of similar size and trim. For example:

- A new Kia Niro plug-in hybrid has a \$9,300 net premium over an equivalent gas-fueled vehicle (i.e., Honda HR-V) but will currently have a payback time of around six years through annual fuel cost savings (1,200 litres of gasoline per year) and lower maintenance costs.
- A new Kia Niro EV has a \$19,200 net premium over an equivalent gas-fueled vehicle (i.e., Honda HR-V) but will currently have a payback time of around nine years through annual fuel cost savings (1,600 litres of gasoline per year) and lower maintenance costs.

For households considering replacing their existing vehicle with an e-bike or a transit pass, the Canadian Automobile Association provides an [on-line calculator](#) to estimate the costs associated with owning and operating a vehicle by make and model. For example, a paid-off 2016 Toyota Corolla that is only driven 10,000 kilometres per year for in-town trips will have annual operating and maintenance costs of approximately \$5,000 (\$2,000 for maintenance, \$1,800 for insurance, \$1,200 for fuel).

Given that the average costs of new e-bikes are between \$3,000 and \$5,000, replacing this 2016 vehicle with an e-bike would pay for itself within about one year. Cargo e-bikes capable of carrying groceries, with a cost range of \$5,000 to \$10,000 depending on the make and model, would pay for themselves within about two years.

Replacing this vehicle with a London Transit monthly pass, at \$1,140 per year, would save almost \$3,900 per year (over \$320 every month).

Home Energy Retrofits

The costs and savings associated with home energy retrofits is largely dependent on the age, condition and size of the house, with older homes generally having greater potential for savings. Incentives of up to \$5,000 are available from both [Enbridge Gas](#) and the [Canada Greener Homes](#) program, but residents are not able to use both programs for the same measure (e.g., cannot apply to both programs for draft-proofing). However, incentives for different measures can be combined between these programs to allow households to receive incentives up to \$10,000. Both programs require a home energy audit before the retrofits can take place.

Based on background market research that has been carried out in support of a proposed home energy retrofit program for London, the most common older housing stock in London are single-family homes built in the 1950s through to the 1970s. These homes typically are heated with high-efficiency gas furnaces already, so future retrofits

would likely involve improving insulation, draft proofing (air sealing), and hybrid heating with air-sourced heat pumps paired with existing high-efficiency gas furnaces. Net-metered solar power may also be of interest to some households.

High-level costs and estimated payback time from lower utility bills for these measures are as follows, noting that these will vary significantly depending on the age, size, and current state of any house:

- Smart thermostat – about \$350, with about a three-year payback currently. Enbridge Gas offers a \$75 incentive as well as a free thermostat for qualifying lower income households.
- Draft-proofing (air sealing) – about \$750, with about a three-year payback currently. Enbridge Gas offers a \$150 incentive or free draft-proofing for qualifying lower income households. Canada Greener Homes also provides incentives.
- Basement insulation – about \$3,000, with about a ten-year payback currently. Enbridge Gas offers a \$1,250 incentive or free insulation for qualifying lower income households. Canada Greener Homes also provides incentives.
- Attic insulation – about \$3,000, with about a 30-year payback currently. Enbridge Gas offers a \$750 incentive or free insulation for qualifying lower income households. Canada Greener Homes also provides incentives.
- Wall insulation – about \$7,500, with about a 25-year payback currently. Enbridge Gas offers a \$3,000 incentive. Free insulation for qualifying lower income households. Canada Greener Homes also provides incentives.
- Air-sourced heat pump – about \$4,000 premium over a new central air conditioning unit. Enbridge Gas is testing a new \$3,200 incentive as part of their pilot project that does not require a home energy audit. The Canada Greener Homes program also offers a \$4,000 incentive but requires a home energy audit. This measure is expected to break even, with more information expected once the pilot project has been completed.
- Net-metered solar power – about \$15,000 to \$17,500 for a 5-kilowatt system. The Canada Greener Homes program offers a \$5,000 incentive. Payback time is currently about 17 to 21 years.

For Londoners in rented homes, the measures above would need to be undertaken by property owners. However, some draft-proofing measures can be undertaken by tenants at a low cost (well under \$100), such as:

- Temporary window film for draft-proofing and insulation;
- Electrical outlet foam gaskets for exterior walls; and
- Draft-proofing tape for exterior doors.

Purchased GHG Emission Offsets

Emissions offset credits are defined by the Canadian Council of Ministers of the Environment (CCME) as GHG emission reductions or removal enhancements generated from project-based activities that compensate for emissions made elsewhere. Offset credits can be generated in both regulatory (for large industrial emitters) and voluntary programs (including small businesses and households).

Emissions offsets and similar products are available to Londoners today. Companies such as [Bullfrog Power](#) offer the purchase the environmental attributes of renewable electricity generation, renewable natural gas, and green fuels to offset the emissions from the customer's use of electricity, natural gas, gasoline and/or diesel. Other companies such as [Less](#), [Planetair](#), and [Tentree](#) offer offsets for flights as well as homes. For example:

- Renewable natural gas – about \$41 per month for 220 cubic metres of gas (\$0.19/m³) in addition to what Enbridge Gas charges;
- Renewable electricity – about \$21 per month for 850 kilowatt-hours (2.5 cents per kWh) in addition to what London Hydro charges;
- Green fuel – about \$0.43 per litre (in addition to what local gas stations charge); and
- Emissions offsets - \$20 per tonne for CSA Standard-Certified Canadian Offsets, or about \$18 per month for the average single-family household (in addition to the average household energy costs of about \$460 per month in 2019). This cost is likely to increase over time as demand increases.

It is important to note that there are challenges regarding the use of offsets within the local community level, specifically around accounting for community wide GHG emissions. At this time, the City of London does not have access to any data from offset providers on the total number of offsets purchased (or sold) on an annual basis by Londoners and London businesses. As a result, City staff are unable at this time to account for their use and contribution towards local emission reductions. Further research, accounting methods and understanding is required to determine the overall value of this approach as a GHG reduction measure at the household level.

Food Waste Reduction (Avoidance)

Food waste reduction (avoidance) can be accomplished in many ways, most of which will have only minor costs (e.g., reusable storage containers) and has the potential for significant savings (e.g., \$450 to \$600 per year for the average London household in 2019). Reducing the amount of uneaten food that goes to waste can be accomplished by meal planning prior to shopping to ensure only the needed amount of food is purchased and properly storing both perishable food and leftovers and consuming them before they go bad.

Londoners can reduce wasted food generated by retailers by purchasing “ugly” fruits and vegetables and taking advantage of deals on discounted fruits and vegetables for recipes that can accommodate them.

Looking for locally produced foods can reduce the amount of demand for foreign foods, which results in lowered transportation GHG emissions, though sometimes locally produced products may come with a cost premium. There are added benefits with supporting local agricultural producers through community supported agriculture programs as well, like getting to know local farmers and learning to eat more seasonally (which has a lower carbon footprint).

Home and Property Resiliency

Several actions can be taken at home on private property to prepare for and adapt to the changing climatic conditions. The following is a short list of measures including high level costs that a homeowner may consider. Since flooding has been identified as one of the highest risks in London caused by climate change, basement flooding preventative measures have been identified as a theme of many of the actions to prioritize.

- Basement flood protection – measures for the basement to prevent flooding from sewer back-up and overland flow including sump pits, sump pumps with back-up power supply, and sewer backflow prevention devices:

Equipment	Item Cost Range
Sump pump	\$100 to \$300
Sump pit	\$100 to \$200
Sump pump battery back-up	\$200 to \$400
Back-flow preventor / backwater valve	\$100 to \$150

Note: the labour costs for installation of the above listed basement flooding prevention equipment will require a qualified plumber which will add to these costs. City of London incentive programs provide for 90% cost recovery up to maximum funding limits for each item.

For example, a sump pit and pump in the basement can access 90% funding to a maximum of \$2,500. Details of London’s basement flooding grant program can be reviewed at london.ca/living-london/water-environment/flooding.

- Outdoor Surface Drainage Protection – measures for the yard to prevent surface water from entering the home including basement window well covers, downspout extensions, downspout splash blocks, and landscaping to maintain or create surface swales. Increasing permeable surfaces may also benefit drainage.

Equipment	Item Cost Range
Basement window well covers	\$50 to \$100
Downspout extension	\$15 to \$25
Downspout splash block	\$25 to \$30
Drainage swale landscaping	
• Grass seed	\$15 to \$20
• Topsoil	\$5 to \$10
• Shovel	\$20 to \$50

Note: the above measures do not typically require professional help to install, and the efforts required can normally be completed by the homeowner.

- 72 Hour Emergency Kit – in the event of a power outage, neighbourhood disaster or any event that requires Londoners to shelter-in-place, these kits can help in the short term.

Equipment	Item Cost Range
Pre-assembled kits	About \$200 (2 person) About \$300 (4 person) About \$500 (4 person, deluxe kit)

Typical items contained in a 72-hour emergency kit are: bottled water, medications, food (for 3 days), first aid kit, wind-up flashlight and radio, external battery pack or wind-up phone charger, dust mask and duct tape, whistle, personal sanitation items, important documents, cash in small bills and coins, warm clothing and blankets or sleeping bags (Source: City of Calgary).

- Tree Planting – planting native trees around the house will provide shade in the summer and can act as a wind break in the winter months reducing the home energy needed for both summer cooling and winter heating. They also absorb carbon dioxide and provide oxygen, therefore providing both climate adaptation and mitigation benefits in addition to absorbing water in their leaves and roots. Boulevard trees also provide the same benefits, and their planting in appropriate locations should be encouraged whenever feasible.
 - tree prices will vary with size, species, and local abundance;
 - wood chips, soil and compost are commonly sold in bags or bulk from many London businesses; and
 - wooden stakes to support newly planted trees range from \$5 to \$10 for a dozen.

Note: tree planting initiatives and programs are often available by contacting City of London Urban Forestry, Upper Thames River Conservation Authority or ReForest London. Lists of appropriate native species type for London and planting advice are also available through these offices.