

# DISTRICT ENERGY & VACUUM WASTE LAKEVIEW VILLAGE

AUGUST 2021

BUILDING INFRASTRUCTURE RESILIENCE  
*FOR THE COMMUNITY AND BEYOND.*



Canada's most transformative  
mixed-use waterfront development  
[mylakeviewvillage.com](http://mylakeviewvillage.com)

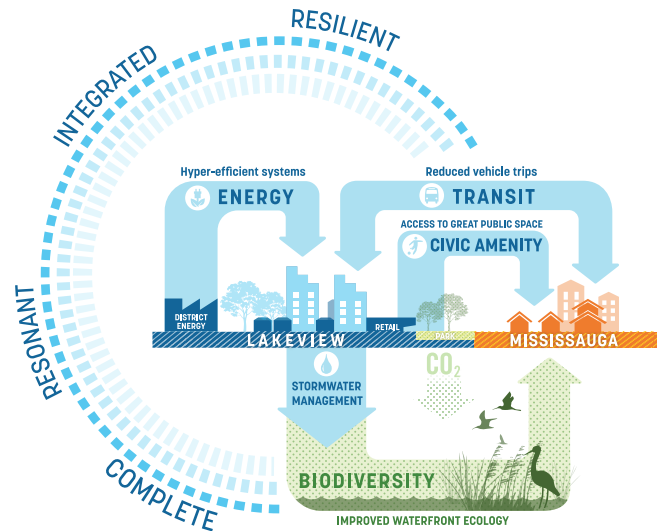
## SUSTAINABILITY STRATEGY



LAKEVIEW VILLAGE SEEKS TO CREATE A HEALTHY, CONNECTED, RESILIENT COMMUNITY, BUILT TO WORLD-LEADING STANDARDS FOR SMART AND SUSTAINABLE DEVELOPMENT.

Lakeview Village is committed to creating Canada’s most innovative and resilient mixed-use waterfront community. Ensuring the development delivers on this important mission requires sustainability to be at the core of the vision and key decision-making. The Lakeview Village sustainability strategy focuses on six priorities to help to achieve planned targets for key sustainable issues, build infrastructure resilience within the community and beyond, and create a smart development that prepares for a future-ready City.

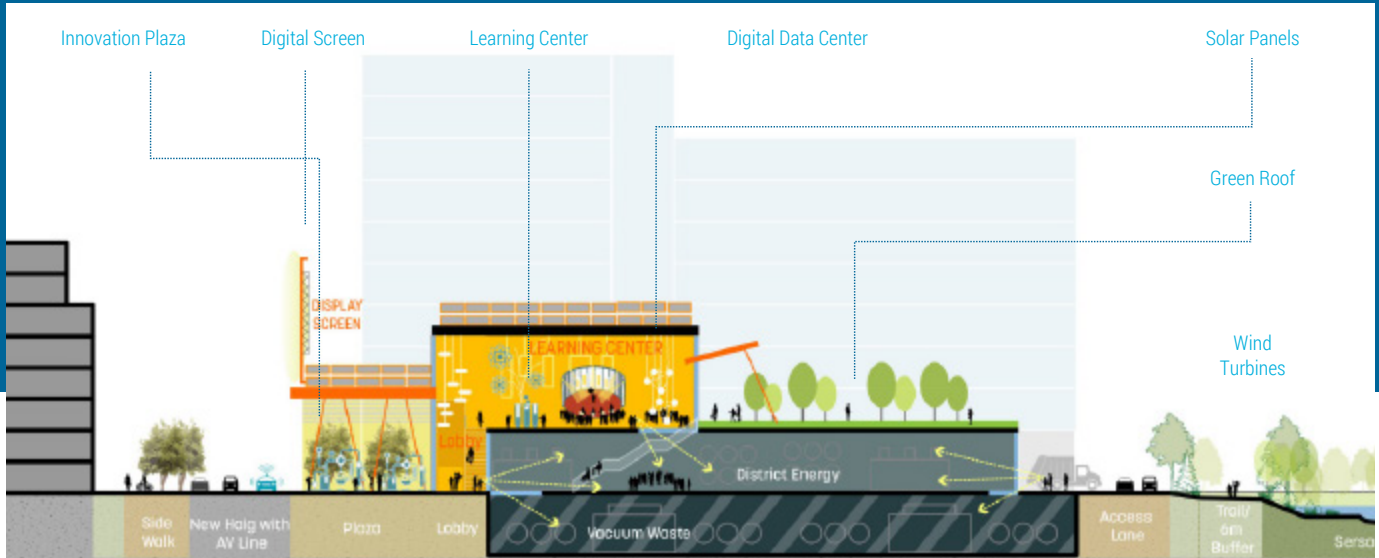
1. **Place**  
Public Spaces, Culture & Identity, Diverse and Affordable Housing.
2. **Prosperity**  
Economic Development, Education, Innovation.
3. **Health & Wellbeing**  
Resilience, Active Living, Healthcare Access, Safety.
4. **Connectivity & Mobility**  
Street Network, Smart Mobility, Smart City Services.
5. **Living Infrastructure**  
Ecosystem Health, Connection to Nature, Natural Features
6. **Resource Regeneration**  
Climate



The City of Mississauga’s Official Plan Amendment (“OPA”) for Lakeview Village was adopted at City Council on July 12, 2018. The OPA encouraged that sustainable infrastructure measures be incorporated into both public and private development, specifically referencing the consideration of an effective waste/recycling collection system (e.g. vacuum collection) and innovative energy production and conservation measures. To deliver on this vision, Lakeview Village has been evaluating key opportunities to become rooted in leading-edge sustainable technologies including district energy and vacuum waste systems.



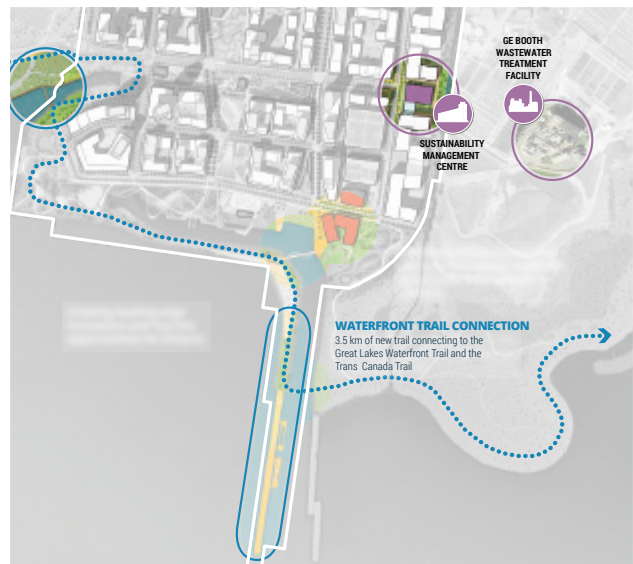
**INFRASTRUCTURE & INNOVATION**



The idea for new technologies such as District Energy and Vacuum Waste at Lakeview Village started with the Late Jim Tovey, Ward 1 Councilor, who visited Sweden and brought back a vision for an innovative, sustainable, low carbon community for Lakeview Village which would include features such as a District Energy System and an Automated Waste Collection System. The City's Climate Change Action Plan further emphasized the need for the City and future land development projects to consider green energy projects such as District Energy as a means to assist the City in meeting its Greenhouse Gas (GHG) emission reduction target of 80% by 2050.

Lakeview Village District Energy ("LVDE") is a community energy system that will provide heating, cooling and domestic hot water to all new buildings on the site. The proposed heat recovery system that uses sewage effluent from the GE Booth Wastewater Treatment Facility next door to LVDE is the first application of this technology in North America to heat and cool buildings and provides an excellent example of leading edge urban district energy technology for Ontario.

Lakeview Vacuum Waste Collection System ("LVWCS") will help to revolutionize how solid waste is sorted, collected, and transported in Ontario. By taking the collection system underground and conveying the waste through a network of pipes to a central depot facility the LVWCS would be the first of its kind in Canada, at the scale proposed, acting as a precedent for communities and a beacon for innovation in Ontario.



*DE and VW plants will be housed in the proposed Sustainability Centre*

## DISTRICT ENERGY



Calgary, AB

### CREATING A RESILIENT LOW CARBON SUPPLY OF THERMAL ENERGY WHILE BUILDING A PATH TOWARDS NET ZERO ENERGY AND CARBON NEUTRALITY.

District Energy Systems (DES) are thermal grids that distribute hot and cold water to various buildings in a community. Buildings on DES have no boilers, chillers or cooling towers. All of their heating and cooling is provided by the DES from a centralized thermal energy plant.

DES heat and cool buildings in a more environmentally friendly way than conventional boilers and chillers. The reduction in greenhouse gasses (GHG) result from higher overall efficiency, utilization of waste heat, and taking advantage of renewable energy (such as biomass or solar thermal).

Having a thermal grid in a community allows it to easily adopt renewable energy sources that would be difficult to implement in individual buildings. In addition it makes it possible to begin utilizing local energy sources and keep valuable energy dollars inside the community.

For the building owner, eliminating complicated heating and cooling equipment helps save on upfront capital costs and makes the building easier to operate and manage in the future. In addition by connecting to a DES the building is committing to environmental sustainability.

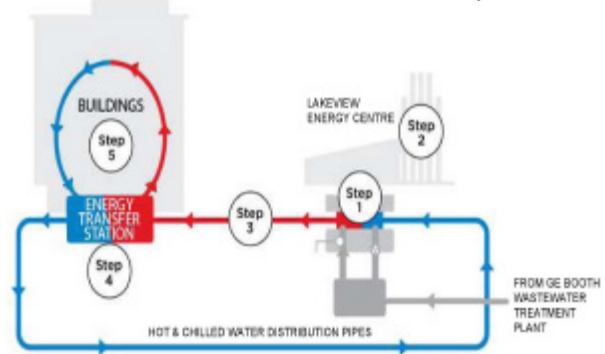


Richmond, BC

**DISTRICT ENERGY FEATURES**



- **SEWAGE EFFLUENT HEAT PUMPS**  
Electric-based centrifugal heat pumps using sewage effluent as a heat source / sink.
- **BOILERS, CHILLERS, COGENERATION**  
For peaking, backup and behind the meter electrical generation.
- **G.E. BOOTH CONNECTION**  
Buried supply and return piping to transport effluent to and from the Waste Water Treatment Plant.
- **ENERGY TRANSFER STATIONS**  
Point of energy transfer between the District Energy system and the buildings.
- **DISTRIBUTION PIPING**  
Direct-buried 4-pipe hot and chilled water distribution piping.





**DISTRICT ENERGY SYSTEM BENEFITS**



**LOW CARBON**

Effective, low carbon, distribution of thermal energy with Significant Carbon savings in the order of **116,000 tonnes of CO<sup>2</sup>** over 25yr period, supporting Mississauga's Carbon reduction goals

**LOCAL SYNERGIES**

Innovative Leveraging of Local Resources using adjacent Wastewater Treatment Plant effluent for heat recovery to satisfy **70% of heating energy and 50% of cooling energy** demands



**INNOVATION**

Technology integrated with adjacent Lakeview Innovation District/Living Lab providing opportunities for research and further innovation



**CLEAN ENERGY**

Increases energy efficiency of buildings through lower mechanical equipment maintenance and energy consumption - assisting the City in achieving its goal of reducing greenhouse gas emissions by 40% by 2030 and 80% by 2050



**FLEXIBLE DESIGN**

Reduces building HVAC equipment which frees up roof top space for Green Roofs and other Climate Change adaption technologies

**SELF SUFFICIENT**

Self generates to provide additional resiliency to the community wide heating and cooling system.



**RELIABILITY & RESILIENCY**

Resilient Infrastructure providing continual thermal energy to Lakeview residents during power outages and natural disasters



**ENGAGEMENT**

Potential to integrate with a Visitor Education Centre to draw attention to and educate visitors regarding climate change impacts and energy solutions



Supports City of Mississauga's climate action plan of **reducing greenhouse gas emissions by 80% by 2050**

## AUTOMATED VACUUM WASTE



### CREATING A WASTE MANAGEMENT ENVIRONMENT TO DRIVE CHANGES TO RESIDENTS' RECYCLING AND WASTE DIVERSION BEHAVIOUR AND REDUCE CARBON EMISSIONS.

The Lakeview Village Vacuum Waste Collection system, if implemented, will be one of the first large scale deployments of a system that revolutionizes how solid waste is sorted, collected, and transported in Canada. By taking the collection system underground and conveying the waste through a network of pipes to a central depot facility waste can be managed through a highly efficient technology driven approach – one that is truly sustainable.

Powered on clean electricity and air, the Lakeview Vacuum Waste Collection system is a far more efficient and cleaner alternative to conventional collection methods as it would eliminate the circulation of over 1,500 garbage truck trips per year throughout the community, hence reducing greenhouse gas emissions as well as noise. As a result, this system will go a long way towards reducing CO2 emissions and supporting the City's goal of reducing greenhouse gas emissions by 80% by 2050.

Through the collection of organic waste material from all of the mid-rise and high-rise buildings in Lakeview (which is not Region of Peel current practice) this system will also go a long way to support the Region's goal of 75% waste diversion by 2034.



Québec City, QC



## AUTOMATED VACUUM WASTE SYSTEM



### HOW DOES AN AUTOMATED WASTE COLLECTION SYSTEM WORK?

The system comprises three primary components, **INLETS, PIPES, AND THE CENTRAL COLLECTION TERMINAL.**

#### 1. THE CENTRAL COLLECTION TERMINAL

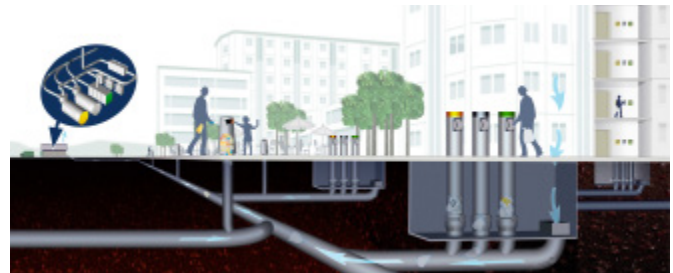
receives all waste from the pipe network then separates and compacts the three fractions collected into one of three transport bins. When full, these large transport bins are collected by truck from this centralized facility.

#### 2. PIPE COLLECTION

Clean airflow is used to transport waste through an underground pipe system to the central collection terminal. Waste is transported through the pipes at a speed of 70km/hr. The pipe network is located under the public roadways.

#### 3. INDOOR WASTE INLETS

located within high-rise and mid-rise residential buildings and office buildings, collects general waste, recyclables, and organics and releases this waste to the pipe network.



#### 4. OUTDOOR WASTE INLETS

located within the Townhouse Blocks and the high-rise/ mid-rise courtyard areas will provide convenient outdoor waste disposal for general waste, recyclables, and organics and releases this waste to the pipe network.

#### 5. SELF EMPTYING LITTER BINS

located within the parks and open-space areas, will collect general waste and convey this waste to the pipe.

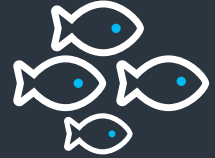


## AUTOMATED VACUUM WASTE SYSTEM BENEFITS



**LOW CARBON**  
1,500 garbage truck trips per year eliminated and 100,000 truck kms reduced from the Community resulting in 51% Fewer CO2 emissions, better air quality and Noise Reduction

**ENVIRONMENTAL**  
More than 50 Self-emptying litter bins within the waterfront parks will reduce single use plastics getting into the Great Lakes



**HIGHER LEVEL OF SERVICE**  
Higher level of waste collection service - operating 24/7/365



**HEALTH & WELL BEING**  
A closed collection system which reduces waste exposure to the environment, increasing overall community health and hygiene



**BETTER DIVERSION**  
Organics will be collected from 100% of Residential units as opposed to less than 5% within Lakeview through traditional collection. The result: overall diversion rate increasing from 17% to 55%

**INNOVATION**  
Technology integrated with adjacent Lakeview Innovation District/Living Lab providing opportunities for research and further innovation



**COST EFFICIENT**  
Waste weighing at source will tie into Peel Region's goal to move towards a "user pays" system



**CHANGING CULTURE**  
Potential to change consumer behaviors around waste through automated waste disposal monitoring combined with end-user incentivization



Supports Region of Peel goal of **75% diversion of waste from landfill by 2034**

## **DISTRICT ENERGY / FREQUENTLY ASKED QUESTIONS**

### **WHY IS LAKEVIEW COMMUNITY PARTNERS AND THE CITY OF MISSISSAUGA CONSIDERING DISTRICT ENERGY FOR LAKEVIEW VILLAGE?**

The idea of a District Energy System for Lakeview started with the Late Jim Tovey, Ward 1 Councilor, who visited Sweden and brought back a vision for an innovative, sustainable, low carbon community for Lakeview Village which would include features such as a District Energy System and an Automated Waste Collection System. The City's Climate Change Action Plan further emphasized the need for the City and future land development projects to consider green energy projects such as District Energy as a means to assist the City in meeting its Greenhouse Gas (GHG) emission reduction target of 80% by 2050.

### **HAS LCPL AND THE CITY RETAINED EXPERTS TO EVALUATE THE FEASIBILITY OF DISTRICT ENERGY FOR LAKEVIEW VILLAGE?**

Yes, LCPL has been working over the last two years with FVB Energy, a very knowledgeable and experienced firm.

FVB Energy (abbreviation for Fjärrvärmebyrå - meaning District Heating Bureau in English) who are based out of Stockholm Sweden with offices in Ontario, have been assisting Municipalities develop DE Systems since the early 1970's.

### **I HEARD THE LAKEVIEW DISTRICT ENERGY SYSTEM MAY USE SEWAGE EFFLUENT AS A POTENTIAL ENERGY SOURCE. HAS THE LAKEVIEW TEAM CONSIDERED UTILIZING LAKE ONTARIO AS AN ENERGY SOURCE? HOW ABOUT GEOTHERMAL?**

Yes the Lakeview team has considered a wide range of energy sources. It was found through a detailed cost/benefit analysis that given the site specific conditions, the most efficient (and innovative) solution would be to tap into the treated wastewater effluent, being generated at the adjacent GE Booth Wastewater Treatment Plant, as a heat source/heat sink.

The most important aspect of a District Energy System is the distribution piping that provides a thermal grid throughout the Lakeview community. This thermal grid allows the community to utilize green and renewable energy sources which can change over time as new technologies become available.

### **WOULD THE CITY OWN AND OPERATE THE DISTRICT ENERGY SYSTEM?**

The City is currently evaluating their ownership options to determine what makes most sense for both the project and the City. Regardless of ownership, operation and maintenance would likely be undertaken by an experienced third party operator.

In addition to a City owned model, the options being evaluated also include a private investor owned model.

Currently, various models for governance are being evaluated with the City and region to determine the ideal approach.

## DISTRICT ENERGY / FREQUENTLY ASKED QUESTIONS

### **I AM VERY INTERESTED IN PURCHASING A HOME WITHIN LAKEVIEW. AS A POTENTIAL PURCHASER, WOULD I SEE HIGHER HEATING AND COOLING BILLS AS A RESULT OF THE DISTRICT ENERGY SYSTEM?**

No. Heating and cooling bills would be similar to what a purchaser of a comparable building in Mississauga that has conventional boilers and chillers. This has been successfully achieved by the Markham District Energy Inc (a thermal energy utility wholly owned by the City of Markham) since its inception over 22 years ago (1988).

### **AS A RESIDENT OF MISSISSAUGA, WHAT CAN I DO TO ASSIST THE CITY IN SEEING THAT A DISTRICT ENERGY SYSTEM IS IMPLEMENTED IN LAKEVIEW VILLAGE?**

The best thing you can do is to speak with your local Ward Councilor, local MPP, and local MP to impress upon them your support for such a green initiative for Lakeview and the need for funding from the three levels of Government.



## VACUUM WASTE COLLECTION / FREQUENTLY ASKED QUESTIONS

### WHY IS LAKEVIEW COMMUNITY PARTNERS AND THE CITY OF MISSISSAUGA CONSIDERING AUTOMATED WASTE COLLECTION FOR LAKEVIEW VILLAGE?

The idea of an Automated Waste Collection System for Lakeview started with the Late Jim Tovey, Ward 1 Councilor, who visited Sweden and brought back a vision for an innovative, sustainable, low carbon community for Lakeview Village which would include features such as a District Energy System and an Automated Waste Collection System.

The City's Climate Change Action Plan further emphasized the need for the City to Monitor and Promote Innovation in Low Carbon and Resilient Technologies, such as Automated Waste Collection, as a means to assist the City in meeting its Greenhouse Gas (GHG) emission reduction target of 80% by 2050.

The Region of Peel also has a goal of 75% waste diversion by 2034. This AWC system will go a long way to support the Region's goal.

### HAS LCPL AND THE CITY RETAINED EXPERTS TO EVALUATE THE FEASIBILITY OF AUTOMATED WASTE COLLECTION FOR LAKEVIEW VILLAGE?

Yes. LCPL and the Region has been working over the last two years with a firm called Envac who are based out of Stockholm Sweden are the inventors of the AWC system. Envac has 35 offices in 22 countries in the Nordics, Europe, Americas, Middle East, Asia and Australia

### I HAVE NEVER HEARD OF VACUUM WASTE COLLECTION, IS IT NEW?

It is fairly new for Canada, but it is quite popular in the UK, Europe, and East Asia. Envac invented the technology in Sweden in the early 1950's and has since installed over 1500 systems supporting 36 million users worldwide.

A similar but much smaller system than that proposed for Lakeview was installed in 2013 in La Cite Verte in Quebec City.

### HOW DOES AN AUTOMATED WASTE COLLECTION SYSTEM WORK?

The system comprises three primary components, inlets, pipes, and the central collection terminal.

The central collection terminal receives all waste from the pipe network then separates and compacts the three fractions collected into one of three transport bins. When full, these large transport bins are collected by truck from this centralized facility

Clean airflow is used to transport waste through an underground pipe system to the central collection terminal. Waste is transported through the pipes at a speed of 70km/hr. The pipe networks is located under the public roadways.

Indoor waste inlets, located within high-rise and mid-rise residential buildings and office buildings, collects general waste, recyclables, and organics and releases this waste to the pipe network.

Outdoor waste inlets, located within the Townhouse Blocks and the high-rise/mid-rise courtyard areas will provide convenient outdoor waste disposal for general waste, recyclables, and organics and releases this waste to the pipe network.

Self emptying litter bins, located within the parks and open-space areas, will collect general waste and convey this waste to the pipe.

## VACUUM WASTE COLLECTION / FREQUENTLY ASKED QUESTIONS

### WILL THE SYSTEM COLLECT ALL KINDS OF WASTE? WHAT ABOUT APPLIANCES OR PAINT?

No, the system will only collect general waste, recyclables, and organics as you would normally see through curb-side pickup. Other items such as electronic waste, hazardous waste, bulk items, etc would need to be transported to one of the Region of Peel's waste transfer stations. Since all residential units (low-rise, mid-rise, high-rise) will be part of a condominium, the condo corporation will arrange for the pick-up and removal of these items.

### WILL THE AWC SYSTEM COLLECT WASTE FROM THE PARKS IN LAKEVIEW VILLAGE?

Yes, self-emptying bins are proposed to be located throughout the City's park and open space areas within Lakeview Village. These bins will not overflow during special events.

### WOULD THE CITY OWN AND OPERATE THE AWC SYSTEM?

Currently, various models for governance are being evaluated with the City and region to determine the ideal approach. In addition to a Region owned model, the options being evaluated also include a private investor owned model.

### I AM VERY INTERESTED IN PURCHASING A HOME WITHIN LAKEVIEW. AS A POTENTIAL PURCHASER, WOULD I SEE HIGHER LEVEL OF SERVICE AS A RESULT OF THE AWC SYSTEM?

Yes, not only will the system operate 24/7/365, but it will also collect organics from the mid-rise and high-rise buildings which is not currently the Region of Peel's practice.

The system will also eliminate the need for indoor/outdoor waste storage bins resulting in much less odour and it will eliminate the need for waste collection trucks to circulate throughout the neighbourhood resulting in better air quality.

### AS A POTENTIAL PURCHASER IN LAKEVIEW, WHAT CAN I DO TO ASSIST THE CITY IN SEEING THAT AN AUTOMATED WASTE COLLECTION SYSTEM IS IMPLEMENTED IN LAKEVIEW VILLAGE?

The best thing you can do is to speak with your local Ward Councilor, local MPP, and local MP to impress upon them your support for such a green initiative for Lakeview and the need for funding from the three levels of Government.

### FOR QUESTIONS OR COMMENTS, CONTACT THE LAKEVIEW VILLAGE PROJECT TEAM:

[info@lakeviewcommunitypartners.com](mailto:info@lakeviewcommunitypartners.com)