

HOUSING YORK INC.
**ENERGY
AND UTILITIES
MANAGEMENT
PLAN**

2020 TO 2024



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Cover Image: Keswick Gardens - Town of Georgina

Executive Summary

In 2016, the Housing York Inc. (HYI) Board adopted the *Achieving New Heights through Innovation and Sustainability Plan*. This plan outlines strategic directions for 2017 to 2020 and the actions that will be taken to achieve them. As part of the direction to effectively manage assets, an action item was established to measure the effectiveness of previous energy initiatives and to develop an energy management plan.

Since 2005, HYI has identified and acted on strategic investments in energy conservation initiatives which have reduced greenhouse gas (GHG) emissions, operating costs and energy consumption. This *Energy and Utilities Management Plan* (EUMP) is HYI's next step in the process of moving toward incorporating the objectives and goals of The Regional Municipality of York's long-term strategy, *Vision 2051*. The EUMP was developed with input from staff and residents through a series of interactive workshops, a comprehensive questionnaire, a best-in-class review of leading social housing providers and multiple building site visits.

Short-Term Goals Over Five Years

The short-term goal is to work in a holistic approach to retrofit buildings based on seven guiding principles to reduce consumption of utilities, operating costs and GHG emissions. The seven guiding principles were used to determine which buildings and projects to recommend.

Guiding Principles

Reduction of greenhouse gas (GHG) emissions

Resident engagement and staff education

Net reduction of operating costs

Climate change adaptation

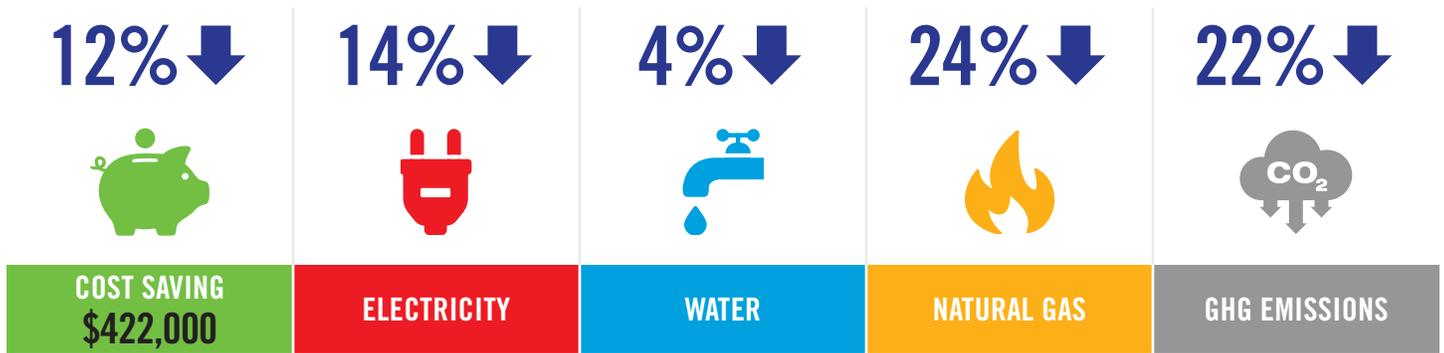
Minimize operating complexity

Consider conservation as part of all capital projects

Maintain a systems perspective

Utilities Reduction Targets

Implementation of the recommended energy conservation projects over the next five years is expected to generate the following annual reductions:



Aspirational Vision

HYI's goal is to align with the Region's *Vision 2051*, to have all buildings achieve zero carbon emissions by 2051 and to incorporate resiliency into infrastructure and communities. A zero carbon building is one that emits no GHG emissions.

Kingview Court - Township of King



Introduction

As of October 2019, Housing York Inc. (HYI) has 2,698 affordable rental housing units across 36 buildings in local municipalities in York Region. Housing stock varies from three to 61 years of age as of 2019. 782 units of new housing have been built since 2004.

The purpose of the *Energy and Utilities Management Plan* (EUMP) is to reduce greenhouse gas (GHG) emissions, utility consumption and operating costs while maintaining resident comfort levels.

BACKGROUND

Since 2005, HYI has identified and acted on strategic investments in energy conservation initiatives which have reduced GHG emissions, operating costs and energy consumption. In September 2005, the HYI Board approved a comprehensive program for energy management to address rising utility costs and reduction of GHG emissions. In September 2006, the HYI Board approved the first energy conservation pilot to determine the best energy conservation initiatives to install on a larger scale in the mass roll out. Based on the pilot project's success, in 2007 the HYI Board approved a five-year energy management retrofit program to reduce GHG emissions which included 20 apartment buildings and five townhouse sites.

In 2016, the HYI Board adopted the *Achieving New Heights through Innovation and Sustainability Plan*. This plan outlines strategic directions for 2017 to 2020 and the actions that will be taken to achieve them. As part of the direction to effectively manage assets, on November 2, 2017 the HYI Board approved the Effectiveness of Previous Energy Management Retrofit Programs. In summary the previous energy retrofit measure resulted in a annual savings of approximately \$140,000 and an annual reduction of 266 tonnes of greenhouse gas emissions.

METHODOLOGY

Best practices, relevant examples and industry standards were considered when forming the scope, model and approach to the EUMP. A professional housing research and development consultant was retained to complete a thorough analysis and review of the portfolio including a series of interactive workshops, a comprehensive questionnaire, a best-in-class review of leading social housing providers and multiple building site visits.

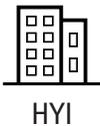
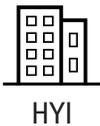
To determine the suggested action for each site, seven guiding principles were established and reviewed for each property to form a comprehensive analysis:

Reduction of GHG emissions	To reduce or eliminate GHG emissions from HYI's building portfolio to align with the Region's 2051 goal of zero carbon building operations
Net reduction of operating costs	To reduce HYI's net operating costs, including utility cost savings and applicable increases or decreases in maintenance costs
Minimize operating complexity	To reduce the number of different building systems and equipment across HYI's portfolio
Integrate a holistic systems perspective when selecting equipment	To assess how new building systems will integrate with existing building systems/ equipment, upgrade supporting building systems/equipment when justified and to assess the performance of buildings as a whole

Resident engagement and staff education	To consider the resident impact for all proposed projects, conduct outreach and education efforts throughout a project's lifecycle to gain buy-in and to promote behaviour changes, and encourage residents' efforts to reduce energy usage and GHG emissions
Climate change adaptation	To consider future climate patterns in the process of developing energy conservation initiatives and upgrading building equipment
Consider conservation as part of all capital projects	To move beyond a "replace like-for-like" system replacement approach, moving towards maximizing energy and utility efficiency for all capital projects

BUILDING UTILITY PAYMENT CATEGORIES

The following six categories represent HYI buildings by utilities payment type, heating source and the percentage of units in each category. These categories assisted staff in determining properties to be selected for EUMP projects.

APARTMENT - HYI pays all utilities		TOWNHOUSE - HYI pays all utilities													
54% (24 buildings = 1458 units)	 HYI	<table border="1"> <tr><td>HEAT</td><td>all</td></tr> <tr><td>HYDRO</td><td>all</td></tr> <tr><td>WATER</td><td>all</td></tr> </table>	HEAT	all	HYDRO	all	WATER	all	<table border="1"> <tr><td>HEAT</td><td>all</td></tr> <tr><td>HYDRO</td><td>all</td></tr> <tr><td>WATER</td><td>all</td></tr> </table>	HEAT	all	HYDRO	all	WATER	all
HEAT	all														
HYDRO	all														
WATER	all														
HEAT	all														
HYDRO	all														
WATER	all														
less than 1% (1 site = 10 units)	 HYI														
APARTMENT - HYI /resident mixed pay		TOWNHOUSE - HYI /resident mixed pay													
21% (5 buildings = 573 units)	 HYI	<table border="1"> <tr><td>HEAT</td><td>all</td></tr> <tr><td>HYDRO</td><td>common</td></tr> <tr><td>WATER</td><td>all</td></tr> </table>	HEAT	all	HYDRO	common	WATER	all	<table border="1"> <tr><td>HEAT</td><td>common</td></tr> <tr><td>HYDRO</td><td>common</td></tr> <tr><td>WATER</td><td>all</td></tr> </table>	HEAT	common	HYDRO	common	WATER	all
HEAT	all														
HYDRO	common														
WATER	all														
HEAT	common														
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WATER	all														
	 Resident	<table border="1"> <tr><td>HYDRO</td><td>in-suite</td></tr> </table>	HYDRO	in-suite	<table border="1"> <tr><td>HYDRO/ HEAT</td><td>in-suite</td></tr> </table>	HYDRO/ HEAT	in-suite								
HYDRO	in-suite														
HYDRO/ HEAT	in-suite														
3 sites = 211 units)	 HYI														
	 Resident														
EMERGENCY HOUSING - Service operator pays all utilities		TOWNHOUSE - Resident pays all utilities													
4% (4 buildings = 115 units)	 HYI	<table border="1"> <tr><td>HEAT</td><td>all</td></tr> <tr><td>HYDRO</td><td>all</td></tr> <tr><td>WATER</td><td>all</td></tr> </table>	HEAT	all	HYDRO	all	WATER	all	<table border="1"> <tr><td>HEAT</td><td>all</td></tr> <tr><td>HYDRO</td><td>all</td></tr> <tr><td>WATER</td><td>all</td></tr> </table>	HEAT	all	HYDRO	all	WATER	all
HEAT	all														
HYDRO	all														
WATER	all														
HEAT	all														
HYDRO	all														
WATER	all														
	 Resident														
7 sites = 342 units)															

NEXT STEPS

Implementation of each initiative in the plan will include opportunities for staff and residents to understand the impact to them and how to use new technologies such as the centralized heating management system. Staff and residents will be engaged early on in the process as understanding the benefits of the projects helps lead to successful implementation.

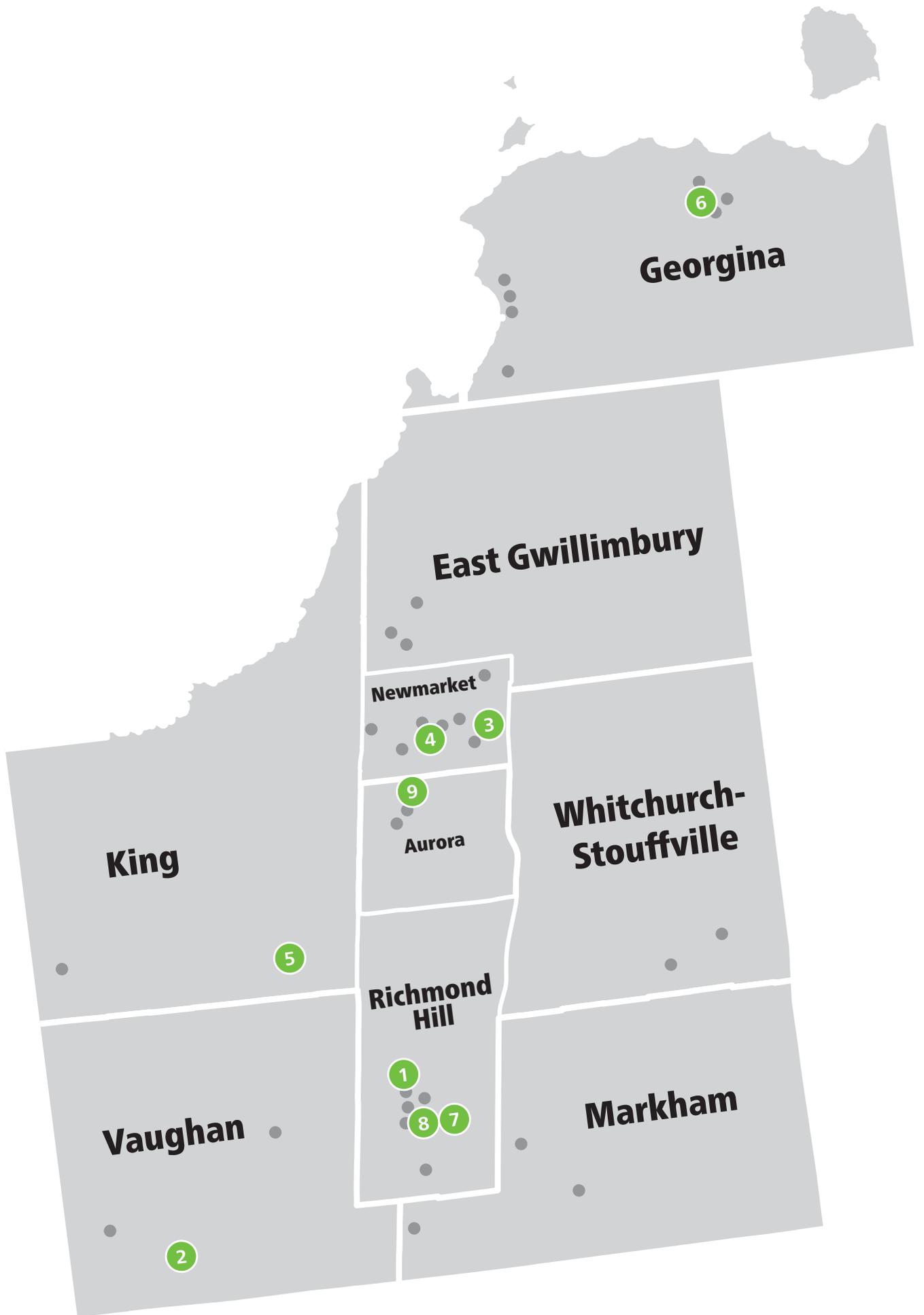
Recommended Buildings

To maximize reduction of GHG emissions and operating costs, the buildings targeted for projects are the largest utility consuming buildings. The proposed energy conservation projects are expected to generate savings and are outlined in the table below:

MAP #	BUILDINGS	MUNICIPALITY	PROJECT YEAR	UNITS
1	Richmond Hill Hub	City of Richmond Hill	2020	202
2	Blue Willow Terrace	City of Vaughan	2020/2021	60
3	Heritage East	Town of Newmarket	2021	121
4	Fairy Lake Gardens I	Town of Newmarket	2022	97
5	Kingview Court I and II	Township of King	2022	66
6	Keswick Gardens	Town of Georgina	2023	120
7	Mackenzie Green	City of Richmond Hill	2023	140
8	Rose Town	City of Richmond Hill	2024	125
9	Hadley Grange	Town of Aurora	2024	80
Total				1,011*

*The number of units recommended for energy conservation initiatives is 37% of the entire HYI portfolio.





Georgina

East Gwillimbury

Newmarket

King

Aurora

Whitchurch-Stouffville

Richmond Hill

Vaughan

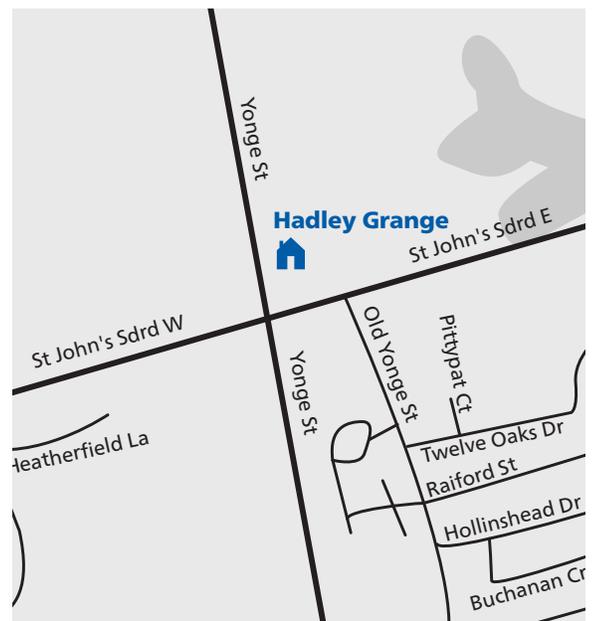
Markham



Hadley Grange

16105 Yonge Street, Aurora, Ontario L4G 6T6
Town of Aurora

Hadley Grange is an 80 unit apartment building for seniors, constructed in 1993 in the Town of Aurora. The main heating source is natural gas. The building was selected because of the high volume of GHG emissions and higher level of natural gas consumption in comparison to other buildings within the HYI portfolio. The selected projects will reduce GHG emissions while lowering energy consumption. Installation is planned for 2024.





ESTIMATED PROJECT COST
\$234,000

PAYBACK
5.4 YEARS



Summary of Projects



LIGHT-EMITTING DIODE (LED) LIGHTING

Existing interior and exterior lights will be replaced with LED lights to improve lighting quality, increase safety through better lighting levels and provide energy savings throughout the building.



CENTRAL HEATING MANAGEMENT SYSTEM

Currently, residents have full control of their unit's temperature. The new system will automatically regulate the heating of each unit to maintain comfort and decrease energy costs while minimizing overheating.



LOW-FLOW WATER FIXTURES

By installing three litre low-flow toilets, HYI will save 50% of water per flush. Low-flow showerheads and low-flow aerators will also be installed in bathrooms and kitchens.



VARIABLE SPEED DRIVE (VFD)

VFDs are used to slow the pump/fan motors down from running at full speed. For example: in the summer when the hallways are extremely hot, this system can be used to slow the motor while still maintaining Ontario Building Code, resulting in a decreased use of electricity.



DOMESTIC HOT WATER (DHW) MANAGEMENT SYSTEM

This system is designed to reduce the circulation of DHW in the apartment building when the hot water is not in use. The system tracks resident usage patterns and automatically turns off the pumps accordingly, saving utility costs.



Medium
UTILITY EXPENSE



Low
ELECTRICITY

Target annual reduction: **20%** ↓



Medium
WATER

Target annual reduction: **20%** ↓



High
NATURAL GAS

Target annual reduction: **45%** ↓



High
GHG

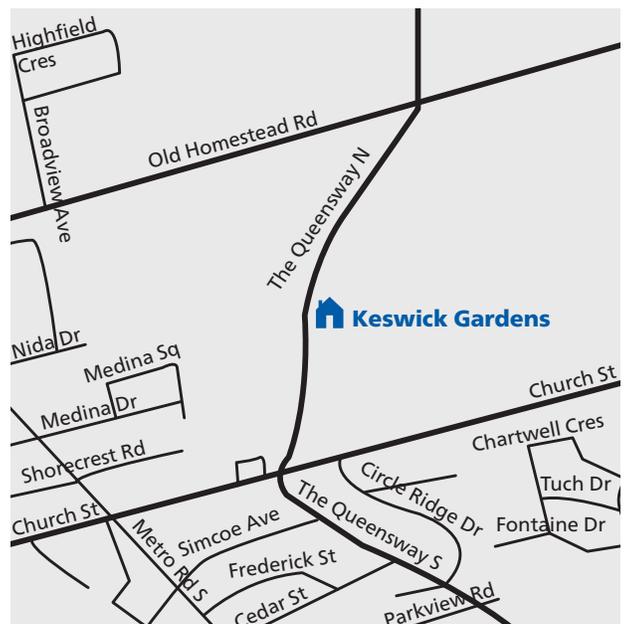
Target annual reduction: **45%** ↓



Keswick Gardens

43 The Queensway North, Keswick, Ontario L4P 3T8
Town of Georgina

Keswick Gardens is a 120 unit apartment building for seniors, constructed in 1991 in the Town of Georgina. The main heating source is electricity. The building was selected because of the high volume of electricity being used and medium GHG emissions, in comparison to other buildings within the HYI portfolio. The selected projects will reduce GHG emissions while lowering energy consumption. Installation is planned for 2023.





ESTIMATED PROJECT COST
\$301,000

PAYBACK
3.7 YEARS



Summary of Projects



LIGHT-EMITTING DIODE (LED) LIGHTING

Existing interior and exterior lights will be replaced with LED lights to improve lighting quality and safety and to provide energy savings throughout the building.



CENTRAL HEATING MANAGEMENT SYSTEM

Currently, residents have full control of their unit's temperature. The new system will automatically regulate the heating of each unit to maintain comfort and decrease energy costs while minimizing overheating.



DOMESTIC HOT WATER (DHW) MANAGEMENT SYSTEM

The system is designed to reduce the circulation of DHW in the apartment building when the hot water is not in use. The system tracks resident usage patterns and automatically turns off the pumps accordingly, saving utility costs.



Medium
UTILITY EXPENSE



High
ELECTRICITY

Target annual reduction: **45%** ↓



Low
WATER

No water projects targeted



Low
NATURAL GAS

Target annual reduction: **25%** ↓



Medium
GHG

Target annual reduction: **30%** ↓



Kingview Court 1 and 2

90 Dew Street, King City, Ontario, L7B 1K3
Township of King

Kingview Court 1 and 2 is a 66 unit apartment building for seniors, with the first building constructed in 1976 and the major addition constructed in 2011. The main heating source is natural gas. The building was selected because of its high volume of GHG emissions and higher level of utility consumption in comparison to other buildings within the HYI portfolio. The selected projects will reduce GHG emissions while lowering energy consumption. Installation is scheduled for 2022.





ESTIMATED PROJECT COST
\$167,000

PAYBACK
6.1 YEARS



Summary of Projects



LIGHT-EMITTING DIODE (LED) LIGHTING

Existing interior and exterior lights will be replaced with LED lights to improve lighting quality, safety and provide energy savings throughout the building.



CENTRAL HEATING MANAGEMENT SYSTEM

Currently, residents have full control of their unit's temperature. The new system will automatically regulate the heating of each unit to maintain comfort and decrease energy costs while minimizing overheating.



DOMESTIC HOT WATER (DHW) MANAGEMENT SYSTEM

The system is designed to reduce the circulation of DHW in the apartment building when the hot water is not in use. The system tracks resident usage patterns and automatically turns off the pumps accordingly, saving utility costs.



High
UTILITY EXPENSE



Medium
ELECTRICITY

Target annual reduction: **10%** ↓



Medium
WATER

Target annual reduction: **20%** ↓



High
NATURAL GAS

Target annual reduction: **40%** ↓



High
GHG

Target annual reduction: **40%** ↓



Fairy Lake Gardens

468 Eagle Street, Newmarket, Ontario L3Y 4Y7
Town of Newmarket

Fairy Lake Gardens is a 97 unit apartment building for seniors, constructed in 1971 in the Town of Newmarket. The main heating source is natural gas. The building was selected because of the high volume of GHG emissions and higher level of natural gas consumption, in comparison to other building within the HYI portfolio. The selected projects will reduce GHG emissions while lowering energy consumption. Installation is planned for 2022.





ESTIMATED PROJECT COST
\$280,000

PAYBACK
6.1 YEARS



Summary of Projects



LIGHT-EMITTING DIODE (LED) LIGHTING

Existing interior and exterior lights will be replaced with LED lights to improve lighting quality, increase safety through better lighting levels and provide energy savings throughout the building.



CENTRAL HEATING MANAGEMENT SYSTEM

Currently, residents have full control of their unit's temperature. The new system will automatically regulate the heating of each unit to maintain comfort and decrease energy costs while minimizing overheating.



LOW-FLOW WATER FIXTURES

By installing three litre low-flow toilets, HYI will save 50% of water per flush. Low-flow showerheads and low-flow aerators will also be installed in bathrooms and kitchens.



VARIABLE SPEED DRIVE (VFD)

VFDs are used to slow the pump/fan motors down from running at full speed. For example: in the summer when the hallways are extremely hot, this system can be used to slow the motor while still maintaining Ontario Building Code, resulting in a decrease in electricity use.



DOMESTIC HOT WATER (DHW) MANAGEMENT SYSTEM

This system is designed to reduce the circulation of DHW in the apartment building when the hot water is not in use. The system tracks resident usage patterns and automatically turns off the pumps accordingly, saving utility costs.



Low
UTILITY EXPENSE



Low
ELECTRICITY

Target annual reduction: **25%** ↓



Low
WATER

Target annual reduction: **20%** ↓



High
NATURAL GAS

Target annual reduction: **60%** ↓



High
GHG

Target annual reduction: **60%** ↓



Heritage East

349/351 Crowder Boulevard, Newmarket, Ontario L3Y 8J5
Town of Newmarket

Heritage East is a 121 unit mixed use apartment building, constructed in 1992 in the Town of Newmarket. The main heating source is electricity. The building was selected because of the high volume of GHG emissions and higher level of electricity consumption, in comparison to other building within the HYI portfolio. The selected projects will reduce GHG emissions while lowering energy consumption, installation is planned for 2021.





ESTIMATED PROJECT COST
\$444,000

PAYBACK
3.0 YEARS



Summary of Projects



LIGHT-EMITTING DIODE (LED) LIGHTING

Existing interior and exterior lights will be replaced with LED lights to improve lighting quality, increase safety through better lighting levels and provide energy savings throughout the building.



CENTRAL HEATING MANAGEMENT SYSTEM

Currently, residents have full control of their unit's temperature. The new system will automatically regulate the heating of each unit to maintain comfort and decrease energy costs while minimizing overheating.



LOW-FLOW WATER FIXTURES

By installing three litre low-flow toilets, HYI will save 50% of water per flush. Low-flow showerheads and low-flow aerators will also be installed in bathrooms and kitchens.



VARIABLE SPEED DRIVE (VFD)

VFDs are used to slow the pump/fan motors down from running at full speed. For example: in the summer when the hallways are extremely hot, this system can be used to slow the motor while still maintaining Ontario Building Code, resulting in a decrease in electricity use.



CAPITAL PROJECT ENHANCEMENT – REPLACE IN-SUITE HEATING SYSTEM

At end of each heating system's useful life, the units will be replaced with a more efficient heat pump to reduce energy demand.



CAPITAL PROJECT ENHANCEMENT - WINDOWS

The windows are at end of useful life. HYI will install triple-pane window system which is 50% more efficient than the existing system. This will result in higher utility savings and better indoor comfort.



DOMESTIC HOT WATER (DHW) MANAGEMENT SYSTEM

This system is designed to reduce the circulation of DHW in the apartment building when the hot water is not in use. The system tracks resident usage patterns and automatically turns off the pumps accordingly, saving utility use.



High
UTILITY EXPENSE



High
ELECTRICITY

Target annual reduction: **60%** ↓



High
WATER

Target annual reduction: **20%** ↓



High
NATURAL GAS

Target annual reduction: **25%** ↓



High
GHG

Target annual reduction: **30%** ↓



Mackenzie Green

145 Essex Ave, Richmond Hill, Ontario L4C 0W8
City of Richmond Hill

Mackenzie Green is a 140 unit mixed use apartment building, constructed in 2013 in the City of Richmond Hill. The main heating source is natural gas. The building was selected because of the high volume of GHG emissions and higher level of natural gas consumption in comparison to other buildings within the HYI portfolio. The selected projects will reduce GHG emissions while lowering energy consumption. Installation is planned for 2023.





ESTIMATED PROJECT COST
\$248,000

PAYBACK
3.7 YEARS



Summary of Projects



LIGHT-EMITTING DIODE (LED) LIGHTING

Existing interior and exterior lights will be replaced with LED lights to improve lighting quality, safety and provide energy savings throughout the building.



CENTRAL HEATING MANAGEMENT SYSTEM

Currently, residents have full control of their unit's temperature. The new system will automatically regulate the heating of each unit to maintain comfort and decrease energy costs while minimizing overheating.



DOMESTIC HOT WATER (DHW) MANAGEMENT SYSTEM

The system is designed to reduce the circulation of DHW in the apartment building when the hot water is not in use. The system tracks resident usage patterns and automatically turns off the pumps accordingly, saving utility costs.



Medium
UTILITY EXPENSE



Low
ELECTRICITY

Target annual reduction: **15%** ↓



High
WATER

No water projects targeted



High
NATURAL GAS

Target annual reduction: **40%** ↓



High
GHG

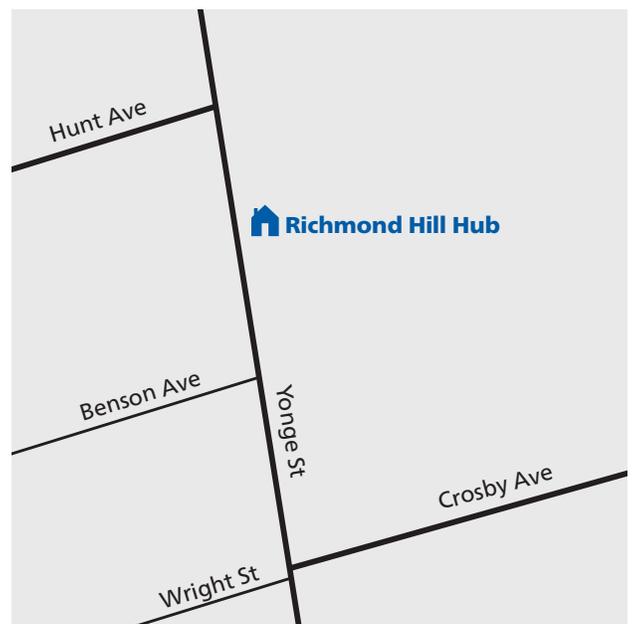
Target annual reduction: **40%** ↓



Richmond Hill Hub

10415 Yonge Street, Richmond Hill, Ontario L4C 0Z3
City of Richmond Hill

Richmond Hill Hub is a 202 unit mixed use apartment building, constructed in 2015 in the City of Richmond Hill. The main heating source is natural gas. The building was selected because of high volume of GHG emissions and medium level of utility consumption in comparison to other buildings within the HYI portfolio. The selected projects will reduce GHG emissions while lowering energy consumption. Installation is planned for 2020.





ESTIMATED PROJECT COST
\$358,000

PAYBACK
4.7 YEARS



Summary of Projects



LIGHT-EMITTING DIODE (LED) LIGHTING

Existing interior and exterior lights will be replaced with LED lights to improve lighting quality, safety and provide energy savings throughout the building.



CENTRAL HEATING MANAGEMENT SYSTEM

Currently, residents have full control of their unit's temperature. The new system will automatically regulate the heating of each unit to maintain comfort and decrease energy costs while minimizing overheating.



DOMESTIC HOT WATER (DHW) MANAGEMENT SYSTEM

The system is designed to reduce the circulation of DHW in the apartment building when the hot water is not in use. The system tracks resident usage patterns and automatically turns off the pumps accordingly, saving utility costs.



Medium
UTILITY EXPENSE



High
ELECTRICITY

Target annual reduction: **5%** ↓



Low
WATER

No water projects targeted



High
NATURAL GAS

Target annual reduction: **50%** ↓



High
GHG

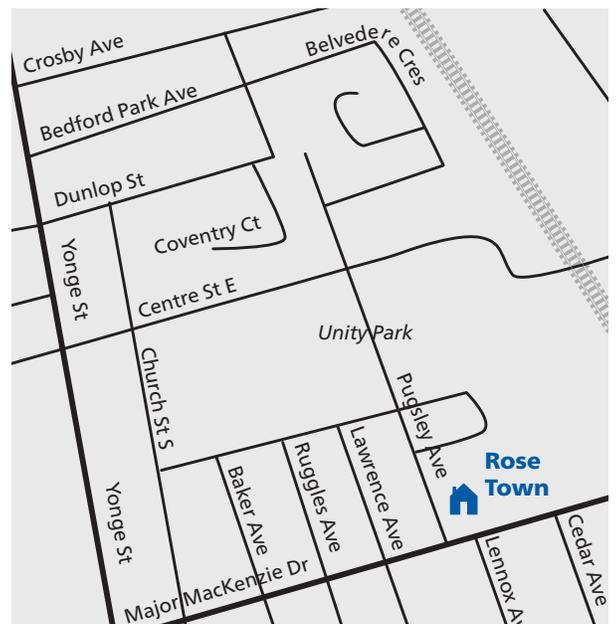
Target annual reduction: **45%** ↓



Rose Town

125 Pugsley Avenue, Richmond Hill, Ontario L4C 8W5
City of Richmond Hill

Rose Town is a 125 unit apartment building for seniors, constructed in 1987 in the City of Richmond Hill. The main heating source is electricity. The building was selected because of the higher volume of electricity being used and to reduce GHG emissions, in comparison to other building within the HYI portfolio. The selected projects will reduce GHG emissions while lowering energy consumption. Installation is planned for 2024.





ESTIMATED PROJECT COST
\$263,000

PAYBACK
5.4 YEARS



Summary of Projects



LIGHT-EMITTING DIODE (LED) LIGHTING

Existing interior and exterior lights will be replaced with LED lights to improve lighting quality, safety and provide energy savings throughout the building.



CENTRAL HEATING MANAGEMENT SYSTEM

Currently, residents have full control of their unit's temperature. The new system will automatically regulate the heating of each unit to maintain comfort and decrease energy costs while minimizing overheating.



DOMESTIC HOT WATER (DHW) MANAGEMENT SYSTEM

The system is designed to reduce the circulation of DHW in the apartment building when the hot water is not in use. The system tracks resident usage patterns and automatically turns off the pumps accordingly, saving utility costs.



Medium
UTILITY EXPENSE



Medium
ELECTRICITY

Target annual reduction: **40%** ↓



Medium
WATER

No water projects targeted



Low
NATURAL GAS

Target annual reduction: **20%** ↓



Low
GHG

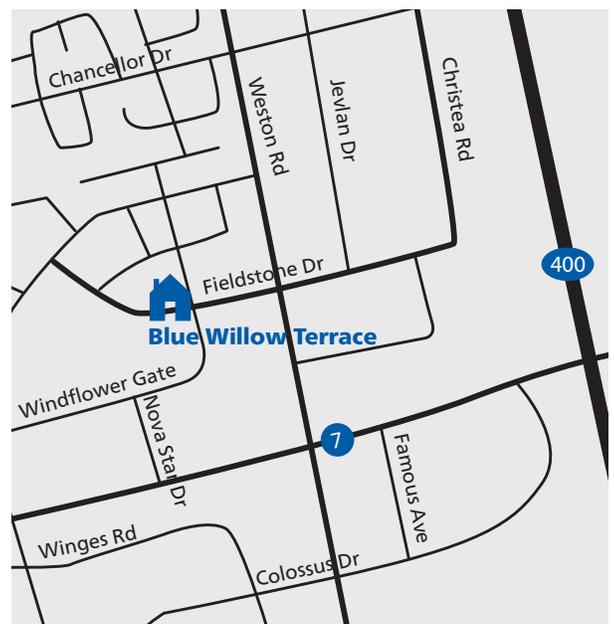
Target annual reduction: **25%** ↓



Blue Willow Terrace

133 Fieldstone Drive, Vaughan, Ontario L4L 0A1
City of Vaughan

Blue Willow Terrace is a 60 unit apartment building for seniors, constructed in 2006 in the City of Vaughan. The main heating source is natural gas. The building was selected because of the high volume of GHG emissions and higher level of utility consumption in comparison to other building within the HYL portfolio. The selected projects will reduce GHG emissions while lowering energy consumption. Installation is planned for 2020/2021.





ESTIMATED PROJECT COST
\$172,000

PAYBACK
4.7 YEARS



Summary of Projects



LIGHT-EMITTING DIODE (LED) LIGHTING

Existing interior and exterior lights will be replaced with LED lights to improve lighting quality, increase safety through better lighting levels and provide energy savings throughout the building.



CENTRAL HEATING MANAGEMENT SYSTEM

Currently, residents have full control of their unit's temperature. The new system will automatically regulate the heating of each unit to maintain comfort and decrease energy costs while minimizing overheating.



LOW-FLOW WATER FIXTURES

By installing three litre low-flow toilets HYI will save 50% of water per flush. Low-flow showerheads and low-flow aerators will also be installed in bathrooms and kitchens.



High
UTILITY EXPENSE



High
ELECTRICITY

Target annual reduction: **10%** ↓



High
WATER

Target annual reduction: **20%** ↓



High
NATURAL GAS

Target annual reduction: **40%** ↓



High
GHG

Target annual reduction: **40%** ↓

