



TOWARDS LOW CARBON COMMUNITIES: *Creating Municipal Green Development Standards*

AN IMPLEMENTATION TOOLKIT FOR MUNICIPAL STAFF



Clean Air Partnership

ABOUT THE CLEAN AIR PARTNERSHIP:

Clean Air Partnership (CAP) is a registered charity that works in partnership to promote and coordinate actions to improve local air quality and reduce greenhouse gases for healthy communities. Our applied research on municipal policies strives to broaden and improve access to public policy debate on air pollution and climate change issues. Clean Air Partnership's mission is to transform cities into more sustainable, resilient, and vibrant communities where resources are used efficiently, the air is clean to breathe and greenhouse gas emissions are minimized.

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TABLE OF CONTENTS

EXECUTIVE SUMMARY	2
INTRODUCTION	7
GLOSSARY	11
PART I: BACKGROUND & REVIEW OF GREEN DEVELOPMENT STANDARDS	12
1.0 THE BENEFITS OF GREEN DEVELOPMENT STANDARDS	13
1.1 What are Green Development Standards?	14
1.2 Why do we need Green Development Standards?	15
1.3 Municipalities and Climate Change Resiliency	16
1.4 Benefits of Green Development: The Value Proposition for GDS	17
2.0 LEGISLATIVE AND POLICY FRAMEWORK	28
2.1 The Planning Act	29
2.2 The Municipal Act	32
2.3 The Ontario Building Code	32
2.4 The Growth Plan for the Greater Golden Horseshoe	33
2.5 Regional Policy Statements	34
2.6 Municipal Official Plan Amendment	36
3.0 THIRD PARTY GREEN BUILDING AND SITE PROGRAMS	38
3.1 LEED	40
3.2 Energy Star, R-2000	41
3.3 Energuide	41
3.4 Passive House	42
3.5 CAGBC Zero-Carbon Building Standard	44
3.6 CHBA Net Zero Home Labelling Program	45
3.7 Living Building Challenge	46
4.0 REVIEW OF GREEN DEVELOPMENT STANDARDS IN ONTARIO MUNICIPALITIES	47
4.1 The Toronto Green Standard	49
4.2 Vaughan, Brampton, Richmond Hill, Markham Sustainability Metrics	50
4.3 Halton Hills	51
4.4 Durham Region Resilient House Standard	53
PART II: MILESTONE FRAMEWORK FOR GREEN DEVELOPMENT STANDARDS IMPLEMENTATION	54
5.0 THE GREEN DEVELOPMENT STANDARDS MILESTONE FRAMEWORK	55

6.0 MILESTONE 1: DECLARATION PHASE	56
6.1 Step 1: Establish a working team and roles in order to build the business case for the Project	57
6.2 Step 2: Identify objectives and current practices and ensure alignment	58
6.2.1 <i>Municipally-Developed Guiding Principles</i>	60
6.2.2 <i>Third Party Developed Guiding Principles</i>	61
6.2.3 <i>Design Principles for Good Green Development Standards</i>	63
7.0 MILESTONE 2: METRIC DEVELOPMENT AND CONSULTATION	64
7.1 Step 1: Conduct analysis	65
7.2 Step 2: Develop metrics	65
7.2.1. <i>Developing the components of your GDS</i>	66
7.3 Creating Metric Resources and Tools for Applicants	67
7.3.1 <i>Metric Scoring Tools</i>	67
7.3.2 <i>Guidebook</i>	68
7.4 How to Demonstrate Metric Compliance/Submission Requirements	68
7.5 Step 3: Internal and External Consultation Plan	69
7.5.1 <i>Internal Engagement Plan</i>	71
7.5.2 <i>External Engagement Plan</i>	73
8.0 MILESTONE 3: IMPLEMENTATION	74
8.1 Step 1: Update and review internal planning application review processes	75
8.2 Step 2: Communicate Green Development Standards project to stakeholders	79
8.3 Step 3: Train staff and applicants	82
9.0 MILESTONE 4: TRACK, MONITOR, AND REVIEW	83
10.0 BEST PRACTICES AND LESSONS LEARNED	85
11.0 INCENTIVES AND MARKETING	87
11.1 Development Charge Rebates	88
11.2 Community Improvement Plans	89
11.3 Expedited Approval Process	91
11.4 Tax Increment Based Grants (TIBG)	92
11.5 Servicing Allocation Based on Compliance	93
11.6 Awards and Recognition Program	95

APPENDIX A: GREEN DEVELOPMENT STANDARDS METRICS FOR LOW-RISE

RESIDENTIAL DEVELOPMENT	96
ENERGY EFFICIENCY	97
ENERGY MANAGEMENT	101
PEDESTRIAN INFRASTRUCTURE	103
PROXIMITY TO BASIC AMENITIES (VOLUNTARY)	104
GREEN BUILDING (ALTERNATE PATHWAY TO ENERGY METRIC)	105
TREE CANOPY — WITHIN PROXIMITY TO BUILDING/PEDESTRIAN INFRASTRUCTURE	106
TREE CANOPY — MAINTAINING EXISTING TREES	108
SOIL QUANTITY AND QUALITY	109
CONNECTION TO NATURAL HERITAGE	111
PEDESTRIAN CONNECTIONS — TRAFFIC CALMING	113
SCHOOL PROXIMITY TO TRANSIT ROUTES & BIKEWAY	114
CULTURAL HERITAGE CONSERVATION	115
CONNECTIVITY	117
DISTANCE TO PUBLIC TRANSIT	119
ACTIVE TRANSPORTATION — PROXIMITY TO CYCLING NETWORK	121
PARKS	122
STORMWATER QUANTITY	123
DEDICATE LAND FOR LOCAL FOOD PRODUCTION	125
SOLAR READINESS	127
PASSIVE SOLAR ALIGNMENT	129
REDUCE POTABLE WATER USED FOR IRRIGATION	130
WATER CONSERVING FIXTURES	131
REDUCE LIGHT POLLUTION	132
BIRD FRIENDLY DESIGN	133
RECYCLED/RECLAIMED MATERIALS	135
MATERIAL RE-USE AND RECYCLED CONTENT	136
ELECTRIC VEHICLE CHARGING	137
BICYCLE PARKING	139

APPENDIX B: PROVINCIAL CASE STUDIES	140
REGIONAL GREEN DEVELOPMENT STANDARDS: QUEBEC	141
REGIONAL GREEN DEVELOPMENT STANDARDS: BRITISH COLUMBIA	145
REGIONAL GREEN DEVELOPMENT STANDARDS: YUKON	151
REGIONAL GREEN DEVELOPMENT STANDARDS: ALBERTA	152
REGIONAL GREEN DEVELOPMENT STANDARDS: SASKATCHEWAN	156
REGIONAL GREEN DEVELOPMENT STANDARDS: MANITOBA	159
REGIONAL GREEN DEVELOPMENT STANDARDS: PRINCE EDWARD ISLAND	163
REGIONAL GREEN DEVELOPMENT STANDARDS:	
NEWFOUNDLAND AND LABRADOR	166
REGIONAL GREEN DEVELOPMENT STANDARDS: NOVA SCOTIA	170
REGIONAL GREEN DEVELOPMENT STANDARDS: NEW BRUNSWICK	173

EXECUTIVE SUMMARY



EXECUTIVE SUMMARY

Green Development Standards (GDS) are voluntary or mandatory measures created by municipalities to encourage design that is environmentally, socially, and economically sustainable. GDS are comprehensive principles to guide development at a level of planning and design that focuses on the community as a whole. These standards are integrated into the planning approvals process, where development applications are asked to meet certain criteria in the GDS.

GDS ARE A CRITICAL IMPLEMENTATION AND POLICY TOOL FOR MUNICIPALITIES. With GDS, municipalities can more effectively achieve Official Plan objectives, GHG reduction targets, sustainability and health goals, and economic development. At the same time, municipalities can manage increasing pressures from population growth and urbanization.

The main sources of GHG emissions in most municipalities are buildings and transportation. These sources of GHG emissions can be reduced through standards that require high-performing new buildings, maintain green spaces, and enable residents to easily access low or zero carbon transportation options.

GDS provide a range of benefits that impact community members over multiple generations by creating healthy, complete, and sustainable communities that offer residents a high-quality of life. Some of the key benefits are:

- » **Using municipal infrastructure more efficiently:** The burden on municipal infrastructure can be reduced with developments that conserve energy and water, manage stormwater runoff, and maintain green spaces. GDS can help to ensure that future service delivery costs are factored into new development and deferring the need for infrastructure upgrades and expansions.

- » **Reducing GHG emissions from new buildings and transportation:** Buildings and transportation are large contributors to community GHG emissions in Ontario municipalities. GDS can reduce these emissions by implementing standards for energy efficiency, and supporting community design that prioritizes low-carbon transportation.
- » **Supporting local economic opportunities:** Green development requires innovative skills and products that can expand the green economy locally and regionally.
- » **Improving health and wellness for residents:** Neighbourhoods with a compact, walkable form and integrated greenspace can improve physical and mental health. Increased physical activity through active transportation benefits seniors and adults who live sedentary lifestyles, and reduces air pollution from vehicles, which benefits children with asthma.
- » **Enhancing the local building stock:** High-quality buildings offer a more comfortable living environment, are quieter, and are less susceptible to mold as a result of air leaks. This improves air quality, reduces sick days, and can increase productivity.
- » **Increasing resilience:** Buildings that include resilience measures improve comfort and resilience to extreme weather events.
- » **Creating diverse communities:** GDS can shape communities to meet the needs of seniors and an aging population, improve safety for vulnerable transportation users, and provide opportunities for economic development where employment space does not currently exist.
- » **Offering cost savings:** Green buildings have lower operating costs compared to traditional buildings, which can help to address fuel poverty.

This toolkit was created to support municipal staff across many different departments who deal with planning, development, sustainability, and transportation projects. It has also been created for decision makers, researchers, NGOs, and community groups who work on sustainability and planning.

This toolkit also presents a new Milestone Framework for municipalities to track their progress through the development of GDS. Some of the key steps in this process are:

- » **Embedding GDS in the Official Plan**, especially as an implementation tool to achieve their vision and goals concerning sustainability, health, growth, and infrastructure management.
- » **Integrating existing standards and requirements** including any performance checklists, urban design guidelines, and other sustainability design briefs into a comprehensive GDS.
- » **Aligning existing or upcoming policy goals and plans** related to community energy, GHG reductions, growth and intensification, resilience, and asset management into the development of GDS.
- » **Engaging with the building and development community** to integrate experiences and leading practices into a GDS.



Municipalities have the opportunity to ensure that new developments efficiently use infrastructure and resources, and minimize environmental impacts. By using GDS, municipalities can create healthy, well-designed communities that have integrated greenspace, pedestrian and transit networks, and that offer a variety of housing, transportation, human services, and employment options.

- » ***Working with upper-tier governments to integrate GDS*** in the upper-tier Official Plan, potentially as an upper-tier framework to guide the development of standards in lower-tier municipalities with a focus on regional alignment.
- » ***Demonstrating corporate leadership by ensuring that all new municipally-owned buildings*** are built to high-performing, sustainable standards.
- » ***Working with upper-tier governments and the development sector*** to identify potential incentives for GDS.
- » ***Embedding GDS into the planning approvals process*** including early pre-design meetings.
- » ***Supporting municipal political champions*** to establish leadership and ambition on climate and energy and to build key relationships between industry, public institutions, and the broader community.
- » ***Identifying municipal staff champions*** across departments, including energy managers, planning staff, legal counsel, and financial staff in order to break down intra-municipal silos and engage with energy stakeholders in the community.
- » ***Using major redevelopment area opportunities to pilot innovative policies and technologies*** create a test-bed for policy and technology innovation. For example, any former industrial areas may provide an opportunity for revitalization of vacant or underutilized employment areas. Developing new low/zero carbon districts can attract innovative knowledge industries and talent.
- » ***Demonstrating corporate leadership in sustainable building design for corporate buildings*** to the community.

INTRODUCTION & GLOSSARY



INTRODUCTION

As the population of Ontario grows by an estimated 193,000 more people per year¹, the demand for residential development is growing. In fact, in 2018, more than 75,000 new homes were constructed in the province, making it one of the fastest growing regions in Canada. The Greater Toronto Area (GTA) region is projected to be the fastest growing region of the province, with its population increasing by 3.4 million, or 49.6 percent, from 6.8 million in 2018 to over 10.2 million by 2046. This increase in population must be met with an increase in new developments.

Rapid growth and urbanization bring new pressures and increasing challenges for municipalities. The homes and buildings we live and work in use over 30% of all energy in the country and consume more than half of all the electricity (Natural Resources Canada, 2006). Cities are increasingly recognizing that the quality of life and competitiveness will in part be driven by how effectively they manage the use of their energy and water resources. Buildings are major consumers of energy and water, and generate waste, air pollution, and greenhouse gas (GHG) emissions. New developments also place an increased burden on municipal infrastructure.

Municipalities have the opportunity to ensure that new developments do more than simply provide additional spaces for people to live, work, and play. Developments should consider the growing concerns around public health, climate change, energy, and resource use. In order to manage growth, use municipal resources efficiently, and improve the health and well-being of residents, municipalities must develop integrated policies and planning processes that holistically consider health, environmental sustainability, and economic burden.

¹ Ontario Population Projections, 2018–2046
<https://www.fin.gov.on.ca/en/economy/demographics/projections>

One of the most powerful tools municipalities have for fighting climate change is also a tool for stimulating local economic development. This tool is their authority over local planning decisions, which includes their ability to approve new construction projects. By implementing green development standards (GDS), municipalities can boost their economies while addressing a suite of environmental priorities, including:

- » Air quality
- » Climate change and energy efficiency
- » Water quality and efficiency
- » Ecology and solid waste

Climate change places increased pressures on urbanizing municipalities, which reinforces the importance of GHG reductions from buildings, and creating connected, green communities. New construction projects present the best opportunities to address climate change by achieving zero carbon performance and creating a low carbon building stock for future generations. New buildings can be designed for optimal efficiency and resiliency. They can readily integrate renewable energy generation and select technologies that avoid the use of fossil fuels.

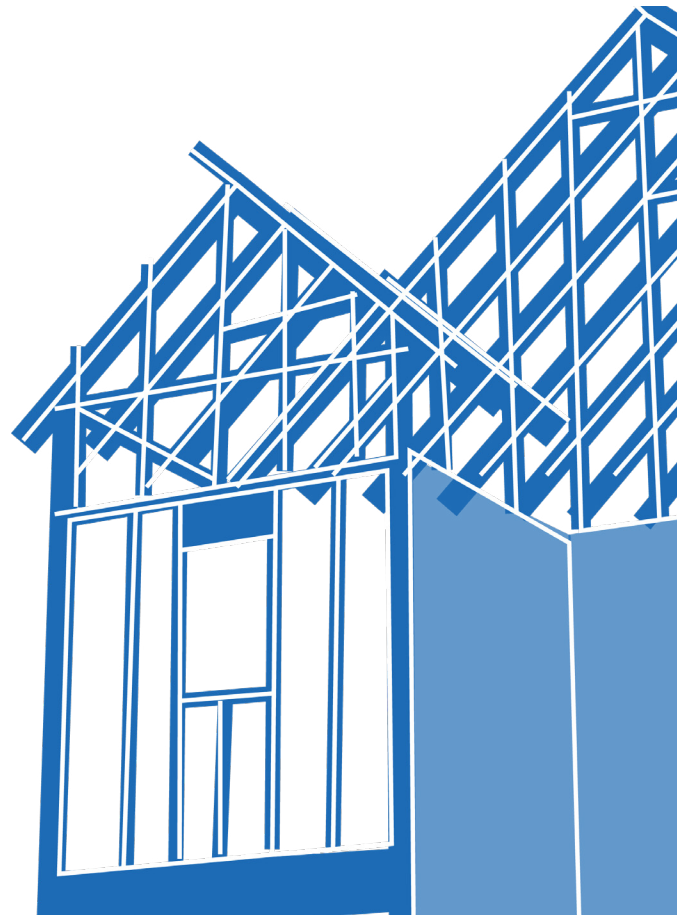
Green development is becoming increasingly commonplace as municipalities work towards taking action on climate change and public health. Across Ontario, a growing number of municipalities are implementing GDS that have the potential to create cleaner, more cost-effective, and energy efficient communities in the future. These standards require developers to consider how their developments use resources and support the municipality's sustainability plans and targets.

The City of Toronto first introduced the Toronto Green Standard in 2006 and is currently implementing Version 3 of the standard for all new developments.

In 2017, Toronto developed its Zero Emissions Building Framework, with energy targets set to achieve zero emissions by 2050, which are implemented through Version 3 of the Toronto Green Standard. The cities of Vaughan, Brampton, and Richmond Hill worked collaboratively in 2008 to develop a set of sustainability metrics as a tool to achieve healthy, complete, sustainable communities. They are currently reviewing their metrics in order to improve performance. In 2010, the Town of Halton Hills developed a voluntary Green Development Evaluation Checklist, which later became a mandatory set of standards for new developments. The Town is also undergoing their third revision to their GDS to identify potential improvements. The City of Mississauga has also implemented a voluntary GDS framework that focuses on Low Impact Development (LID) metrics, but has aligned their GDS with their stormwater fee implementation, which was found to increase uptake from the development community.

Municipalities are not alone. One of the key features of GDS is building performance, which is increasingly being discussed at every level of government. There is a national movement to align building codes with the Pan-Canadian Framework on Clean Growth and Climate Change, which establishes a goal for all provinces to adopt a net zero energy ready model building code by 2030. Net-zero energy buildings produce as much clean energy as they consume. They are up to 80% more energy efficient than a typical new building, and use on-site (or near-site) renewable energy systems to produce the remaining energy they need. A net-zero energy ready building is one that has been designed and built to a level of performance such that it could, with the addition of solar panels or other renewable energy technologies, achieve net-zero energy performance.

In British Columbia, the provincial government introduced the BC Energy Step Code in 2017 to provide an incremental and consistent approach to achieving more energy-efficient buildings that go beyond the requirements of the base BC Building Code. The City of Vancouver has also implemented a Zero Emissions Building plan to transition to zero emissions buildings in all new construction by 2030. Leading building industry organizations are also beginning to develop voluntary standards to encourage the construction of high performance, low-carbon buildings. The Canada Green Building Council released its Zero Carbon Building Framework in 2016, and is in the process of creating an associated Zero Carbon certification program.



GLOSSARY

Note: In some parts of this document, Green Development Standards (GDS) and “sustainability metrics” will be used interchangeably.

COMMUNITY IMPROVEMENT PLAN:

A Community Improvement Plan (CIP) is a tool under Section 28 of the Planning Act that allows a municipality to direct funds and implement policy initiatives toward a specifically designed project area, provided it has enabling policies in its Official Plan.

DEVELOPMENT CHARGES:

Development Charges (DC's) are fees collected from developers and builders at the time a building permit is issued to pay for municipal infrastructure and services.

NET-ZERO ENERGY: A building or project that is deemed to be “Net-Zero Energy” is one that produces all the energy it consumes on an annual basis, from on-site resources which are renewable.

NET-ZERO ENERGY BUILDING:

A building which produces as much energy (including both electrical power and heat) as it consumes on a yearly basis.

NET-ZERO ENERGY COMMUNITY:

A community which produces as much energy as it consumes on a yearly basis. Some buildings will likely generate more energy than others, but as a community, they will together offset their combined annual energy demand.

LEED: Leadership in Energy and Environmental Design: A checklist based family of green building certification programs managed by the US Green Building Council (USGBC) with domestic support by the Canada Green Building Council (CaGBC).

GREEN DEVELOPMENT STANDARDS:

- » Passive House
- » Energy-Star
- » Official Plan
- » Ontario Building Code
- » Zoning By Law

PART I:

BACKGROUND & REVIEW OF GREEN DEVELOPMENT STANDARDS



1.0 | THE BENEFITS OF GREEN DEVELOPMENT STANDARDS



KEY TAKEAWAYS:

- » GDS are a critical implementation and policy tool for municipalities to achieve their GHG reduction targets, their Official Plan goals, and their goals in many areas of sustainability.
 - » GDS are comprehensive principles to guide development at a level of planning and design that focuses on the community as a whole.
 - » GDS provide a range of benefits that impact community members over multiple generations by creating healthy, complete, and sustainable communities that offer residents a high-quality of life.
 - » GDS can help reduce the burden on municipal infrastructure and support local economic opportunities.
-

1.1 | WHAT ARE GREEN DEVELOPMENT STANDARDS?

GDS are voluntary or mandatory measures developed by municipalities to encourage developers and builders to create thoughtful and innovative developments using sustainable design, which considers the principles of economic, social, and ecological sustainability. GDS are a tool for municipalities to implement their Official Plans. GDS are not only energy codes or standards, though these may be one component. GDS are comprehensive principles to guide development at a level of planning and design that focuses on the community as a whole. They provide direction in shaping and structuring community design to minimize GHG emissions, preserve the natural environment, reduce infrastructure demands, and create connected communities.

GDS are a critical policy tool for municipalities to achieve their GHG reduction targets, their Official Plan goals, and their goals in many areas of sustainability. The main sources of GHG emissions in most municipalities are buildings and transportation, which can be reduced through requiring high-performing new

Some of the features of communities shaped by Green Development Standards include:

- » Energy efficiency
- » Bird friendly design
- » Green space/parks
- » Proximity to schools
- » Mixed-use development
- » Electric vehicle charging
- » Active transportation
- » Proximity to transit
- » Street amenities
- » Tree canopy
- » Healthy soil
- » Stormwater

buildings, maintaining green spaces, and enabling residents to easily access low or zero carbon transportation options.

At the same time, the full suite of standards included in a GDS address Official Plan goals by managing growth and urbanization. In doing so, the built form of homes and public spaces reduces demands on infrastructure and reflects high environmental performance while creating healthy, complete, and sustainable communities.

As a result, municipalities can build great communities that offer residents a high quality of life.

Formalizing a list of GDS can provide a basis for your municipality to review development applications, with a focus on new development. The GDS can assist the municipality in evaluating documents and technical reports provided in support of development applications, such as Community Design Guidelines and/or Urban Design Briefs that describe the sustainable aspects of proposed developments and how sustainable initiatives will be achieved.

1.2 | WHY DO WE NEED GREEN DEVELOPMENT STANDARDS?

Climate change is significantly impacting cities across the world, including those in Canada. Municipalities are witnessing rising temperatures, increased severe weather events, threats to agriculture, and impacts to health. In its latest report, the Intergovernmental Panel on Climate Change (IPCC) finds that limiting global temperature increases to 1.5 °C would require rapid and transformational changes to land, energy, industry, buildings, transport, and cities. This

would mean reducing global GHG emissions by 45% from 2010 levels by 2030, and reaching net zero around 2050. The impacts and costs of this warming will be far greater than previously forecasted, and will impact ecosystems, human health, and well-being. Achieving the reductions necessary to limit global warming is possible through many actions that are currently underway, but they need to be scaled up and accelerated. In 2015, Canada signed onto the Paris Agreement, committing to reduce annual emissions to 30 percent below 2005 levels by the year 2030. Canadian voters are also concerned about climate change. A September 2019 Abacus Data Clean Energy Canada poll found that 9 in 10 voters see climate action as important or urgent. An October 2019 pre-election poll conducted by Ipsos found that 29% of Canadians included climate change among their three most important issues.

It is clear that Canadians are concerned about sustainability. However, the majority of Canadians lead high carbon lifestyles — they live in energy inefficient buildings and car-dependent communities. Municipalities play a key role in tackling climate change in their jurisdictions.

They have the power to help Canada achieve its Paris targets, and to help the average Canadian's desire to lower their carbon footprint. Furthermore, they stand to be impacted the most by the effects of a changing climate, and thus are on the front lines of leading adaptation and mitigation efforts.

Municipalities now have the opportunity to put cost-effective policies in place that will benefit their taxpayers in the future. With GDS in place, they can ensure that buildings and infrastructure are constructed to be more resilient to disruptions from extreme weather events. In addition, designing new buildings with lower energy demands today will be more cost effective than potentially retrofitting them 10-20 years in the future.

1.3 | MUNICIPALITIES AND CLIMATE CHANGE RESILIENCY

Municipalities are already feeling the impacts of climate change on an intimate level. In many Ontario communities, the design of buildings, roads, farms, sewers and electricity distribution systems were based on historical climate information.

As the frequency of extreme weather events increases, municipalities are dealing with more devastating impacts from events like flooding, heat waves, drought, snow and ice storms. These result in many new challenges including: evacuations, disruption of services, damage to critical infrastructure, business interruption, and threats to health.

Aging infrastructure also creates financial challenges for municipalities. Municipalities are struggling to maintain and replace infrastructure when it is unable to function due to new temperature extremes and storm surges. In 2008, it was estimated that the cost of bringing municipal infrastructure into a good state of repair was \$22.4 billion, with an additional \$3.7 billion investment needed annually to meet current and future needs¹. Municipal infrastructure accounts for nearly half of the Province's public infrastructure stock. Municipalities, in addition to conservation authorities and the province, also run the risk of litigation due to extreme weather events, which can result in damages and costs. For example, in 2010, the City of Stratford paid \$7.7 million to settle a class action lawsuit brought on by residents who were flooded in a 2002 storm.

¹ Ontario Provincial Municipal Fiscal And Service Delivery Review
<http://www.mah.gov.on.ca/AssetFactory.aspx?did=6050>

A 2012 flood in Thunder Bay resulted in failure and flooding of the city's sewage control plant, resulting in a \$300 million class action lawsuit against the City. In 2016, a \$900 million class action lawsuit was launched by Muskoka residents and business owners against the province due to flood damage.

It is clear that climate change is exacerbating pressures on infrastructure capacity. Sustainable development and green infrastructure help municipalities to avoid costly damages, while also providing a wealth of co-benefits.

1.4 | BENEFITS OF GREEN DEVELOPMENT: THE VALUE PROPOSITION FOR GDS

GDS provide a range of benefits beyond GHG reduction that impact community members, over multiple generations — economic benefits, health benefits, and benefits that can help to address municipal priorities and goals.

These benefits have been documented in studies and reports in Canada and internationally. In 2008, a cost-benefit study of the Toronto Green Standard concluded that the benefits derived from green development overwhelmingly outweigh the costs associated with building better². The study found that the marginal premium invested in green development can significantly improve environmental, social and economic outcomes, not only in Toronto, but the entire Greater Golden Horseshoe Region. It also found that "development that is not sustainable is neither cost effective, nor equitable".

² Cost/Benefit Analysis of Proposed Energy Efficiency Requirements for the Toronto Green Standard: Final Report
https://www.daniels.utoronto.ca/sites/daniels.utoronto.ca/files/old/Kesik_TGDS_CB-Study_Oct2008.pdf



Using municipal infrastructure more efficiently: The burden on municipal infrastructure can be reduced with developments that conserve energy and water, manage stormwater runoff, and maintain green spaces. GDS can help to ensure that future service delivery costs are factored into new development and deferring the need for infrastructure upgrades and expansions.



Reducing GHG emissions from new buildings and transportation: Buildings and transportation are large contributors to community GHG emissions in Ontario municipalities. GDS can reduce these emissions by implementing standards for energy efficiency, and supporting community design that prioritizes low-carbon transportation.



Supporting local economic opportunities: Green development requires innovative skills and products that can expand the green economy locally and regionally.



Improving health and wellness for residents: Neighbourhoods with a compact, walkable form and integrated greenspace can improve physical and mental health. Increased physical activity through active transportation benefits seniors and adults who live sedentary lifestyles, and reduces air pollution from vehicles, which benefits children with asthma.



Enhancing the local building stock: High-quality buildings offer a more comfortable living environment, are quieter, and are less susceptible to mold as a result of air leaks. This improves air quality, reduces sick days, and can increase productivity.



Increasing resilience: Buildings that include resilience measures improve comfort and resilience to extreme weather events.



Creating diverse communities: GDS can shape communities to meet the needs of seniors and an aging population, improve safety for vulnerable transportation users, and provide opportunities for economic development where employment space does not currently exist.



Offering cost savings: Green buildings have lower operating costs compared to traditional buildings, which can help to address fuel poverty.

ENVIRONMENTAL BENEFITS:

The primary direct benefit that GDS confers is for the environment. Development has significant impacts on the environment and resources. Buildings are major consumers of energy, natural resources and water, and generate landfill waste, air pollution and GHG emissions. The way that communities are structured also influence the modes of transportation used – which has direct implications on transportation-related GHG emissions. When GDS are implemented, municipalities play a direct role in minimizing these negative impacts to the natural environment.

New developments represent an important opportunity for municipalities to reduce their GHG emissions. Many municipalities across Canada have set targets to reduce their GHGs by 80% below 1990 levels by 2050, or are aiming for net zero carbon. In order to achieve these targets, municipalities must address emissions from new developments and ensure that new communities make it easier for residents to use low or zero carbon transportation.

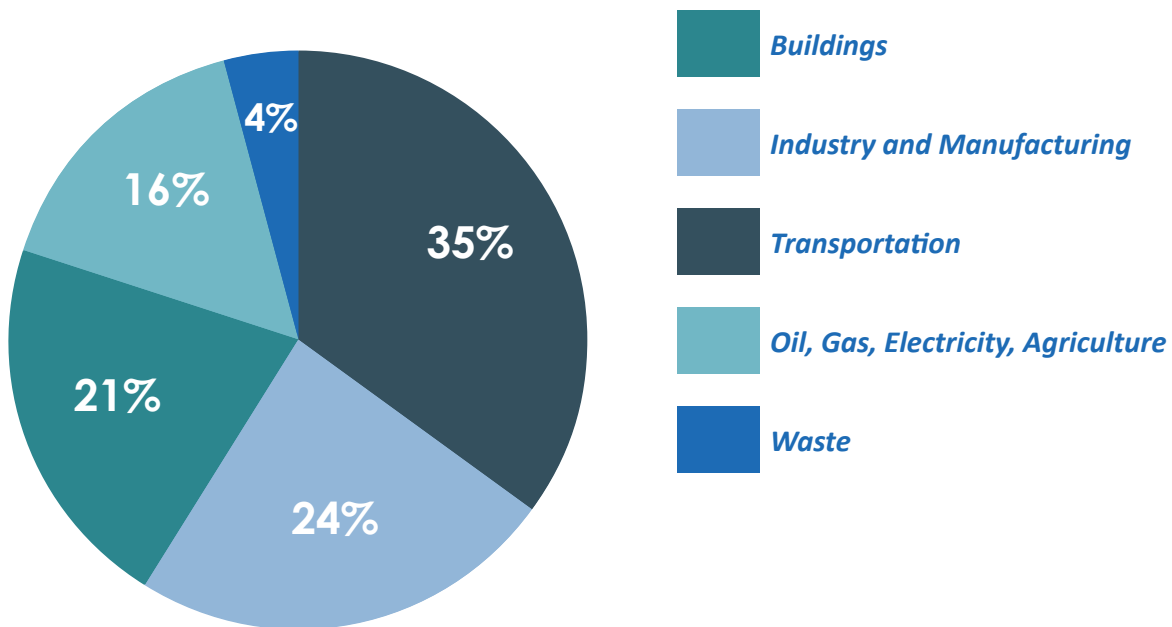
An important component of GDS is focused on buildings, notably because they are a significant source of GHG emissions. In 2016, buildings were the third largest contributor to Ontario's total GHGs at 21% (see Figure 2). Of this 21%, residential buildings contribute to 55% of emissions from buildings.

Residential buildings produce GHGs through space and water heating fuels, and electricity. Space and water heaters commonly use fossil fuels including natural gas, heating oil, and propane. These produce GHGs directly when burned to generate heat. Meanwhile, GHGs are also produced when fossil fuels are used to generate the electricity used by homes. In Ontario, over 90% of electricity is generated from low-carbon energy sources such as nuclear, hydro, and other renewables. However, natural gas power plants are also used, creating GHGs in our electricity grid. To reduce the GHGs from homes, the energy used to heat and operate the home must be significantly reduced through energy efficiency and, ultimately, homes will need to switch to low- carbon electric sources for heating and cooling.

Thus, when a GDS sets requirements for energy efficient buildings, developers and builders will construct in such a way as to minimize the heating and cooling demands and enable the building to generate its own power, thus reducing the carbon emissions from that building.

Similarly, a GDS that sets requirements for water efficient buildings also confers benefits on the environment. Buildings with efficient water systems use less water and reduce pressures on municipal infrastructure and service delivery.

FIGURE 1: ONTARIO GHG EMISSIONS BY ECONOMIC SECTOR, 2016



Source: Environment and Climate Change Canada- National Inventory Report

MUNICIPAL GOVERNMENT AND TAX PAYER BENEFITS:

GDS offers municipalities a way to address increasing population pressures, in addition to directly benefitting the taxpayer by creating resilient, liveable, and competitive communities where people want to live and invest.

Increasing development places additional burdens on municipal infrastructure, and impacts service delivery. This burden can be minimized by designing buildings to conserve water and energy, manage stormwater runoff, and maintain green spaces. GDS can help to ensure that future service delivery costs are factored into new development, such as those for stormwater and energy. This represents real savings for taxpayers by deferring or eliminating the need for infrastructure upgrades and expansions.

Better performing buildings can also contribute to short and long term fiscal sustainability for municipalities. Higher quality, energy efficient buildings improve the value of the municipality's stock of residential and commercial buildings. As building occupants

seek the benefits of multi-year cost savings, lower vacancy rates will result in increased property values, which provides benefits via increased property tax revenue. Similarly, if a municipality currently offers discounted property taxes for vacant properties, once these are occupied, tax revenues increase.

GDS that prioritize connectivity through improved access to transit and active transportation help a municipality address the serious costs of traffic congestion. In the Greater Toronto and Hamilton Area alone, a 2008 study by Metrolinx³ quantified the economic burden of congestion to be \$3.3 billion for commuters and \$2.7 billion in lost opportunities for economic expansion in 2006 alone. If this increasing congestion is not addressed, the economic, social and environmental costs will more than double over the next 25 years.

Finally, municipalities can also create and support local economic opportunities by creating GDS. Green development requires innovative skills and products that can expand the green economy locally and regionally.

³ http://www.metrolinx.com/en/regionalplanning/costsofcongestion/ISP_08-015_Cost_of_Congestion_report_1128081.pdf

DEVELOPMENT COMMUNITY BENEFITS:

Home buyers and tenants are increasingly demanding higher quality homes that deliver environmental performance, comfort, and health. The Canadian Home Builders' Association's 2019 Nationwide Home Buyer Preference Study found that home buyers included four energy efficient features in their top ten list of "Must Have" home features. These include energy-efficiency appliances, high-efficiency windows, an overall energy-efficient home, and HRV/ERV Air Exchange.

Many developers and commercial property owners are already voluntarily building better quality buildings, including net zero emissions buildings:

- » In 2016, Reid's Heritage Homes constructed five Net Zero Energy homes in Guelph and was nominated for a Net Zero Home Award in the 2017 Canadian Home Builders' Association National Awards for Housing Excellence.
- » RND Construction has built 4 certified Net Zero Ready homes, and dozens of other energy-efficient green homes in Ottawa.
- » In London, Sifton Properties has built the West Five community, a net zero energy complete community that includes office, retail, residential, and public open spaces.
- » In Waterloo, Evolv1 is a Zero Carbon commercial building that features 104,000 square feet of office space. It is the first multi-tenant building of its kind in Canada that has the goal to achieve a net positive carbon output.

These developments demonstrate that there is demand for these buildings in different areas of the province. Where it is difficult to get buyers and tenants to value these improvements, municipalities can level the playing field by introducing GDS. Developers prefer when the same requirements apply to all of the players in the sector. As many developers work across jurisdictions, they often have to comply with different municipal requirements. Municipalities can reduce the complexity and burden of navigating different standards by aligning their requirements with those in place in nearby jurisdictions.

Research in BC shows that it is not prohibitively expensive for builders to meet higher standards, such as those for energy efficiency. A research report on the BC Energy Step code found that meeting the requirements of the Lower Steps of the BC Energy Step Code involve only very modest construction premiums⁴. In most situations, builders can achieve the Lower Steps for less than a 2% construction cost premium above that of a home built to the requirements of the BC Building Code. The construction cost premiums associated with Step 1 compliance is even smaller — just a small fraction of a percent. This finding suggests that improved energy efficiency and affordability can go hand in hand.

Better quality homes offer occupants a wealth of benefits. Energy and water efficient homes offer savings to occupants through reduced electricity, heating, and water costs. This provides increased economic certainty for occupants by reducing their exposure to fluctuations in the cost of natural gas, electricity and water. They also offer a more comfortable living environment. Homes built to modern

standards are quieter as result of efficient HVAC equipment and insulated building envelopes. They are less drafty and less susceptible to mold as a result of air leaks. This leads to a better quality of life, improved sleep, and better health.

This presents municipalities with an opportunity to work with developers to align their GDS with what is currently being delivered and map out a path for better building performance over time.

HEALTH BENEFITS:

Physical health, wellness, mental health, and loneliness are emerging as some of the key public health issues receiving attention from all levels of government. Addressing trends in chronic diseases for even a small percentage of the population will have a dramatic savings in health care costs. Community design, a key component of a municipality's GDS, can play a role in addressing these issues. GDS can support neighbourhoods with compact, walkable form and opportunities to use active transportation.

⁴ 5199 BC Housing et al. 2017. Energy Step Code: Building Beyond the Standard. 2017 Metrics Research Full Report. Victoria: BC Housing. <https://www.bchousing.org/research-centre/library/residential-design-construction/energy-step-code-2017-full-report&sortType=sortByDate>

This increases physical activity, which has both physical and mental health benefits. By doing so, fewer trips will be made with gasoline vehicles, which can decrease air pollution and smog. Seniors who need physical activity, children with asthma, and adults who live sedentary lifestyles can all gain from more opportunities to engage in physical activity and wellness through a decreased reliance on cars. Communities with parks, street trees, and other green spaces improve mental health, decrease stress, and enable increased social interaction.

Green buildings increase staff satisfaction, air quality, reduce sick days, and increase productivity. According to a study done by the World Green Building Council, one of the top reasons for building green according to builders globally is that green building promotes improved occupant health and well-being. Increasing worker productivity, creating a sense of community and being aesthetically pleasing are considered important by many builders.

HOMEOWNERS AND COMMUNITY BENEFITS:

Green buildings and communities offer numerous benefits to residents and their communities. Communities shaped by GDS can help to meet the diverse needs of residents in their communities. For seniors, GDS can shape communities to ensure that development is built to meet the needs of an aging community through access to transit, accessible pedestrian and building design, and proximity to amenities. For all road users, GDS can help to improve community safety by building complete streets that address safety for the most vulnerable transportation users – pedestrians, school children, older adults and cyclists. For business and employment, GDS can provide opportunities for economic development by providing spacing for employment where it may not currently exist.

For home buyers, GDS can increase the supply of high quality buildings, which are an attractive investment. GDS can increase the long term resiliency of a home, and lower insurance costs. In addition, green buildings are more comfortable and healthier to live in than older, conventional homes.

Buildings with a tighter envelope maintain comfortable indoor temperatures and are quieter due to less exterior noise penetration. This can support a better quality of life through improved sleep and better health.

Aside from comfort and health, the growth of the green building sector thus far has been largely driven by the attractive economic benefits these buildings offer. Owners of green buildings accrue benefits through operating cost savings, payback on investments, and improved asset value.

Green buildings have lower operating costs compared to traditional buildings, as they use less energy and water. This can help to address fuel poverty through lower operating costs. According to a survey by the World Green Building Council, green building owners in Canada reported 12% cost savings over a 12-month period in 2018, which are among some of the highest savings globally.⁵

In addition to cost savings, green buildings offer important benefits for resilience that will be increasingly important in the near future. As climate change increases the frequency of extreme weather events, home buyers will value homes that provide both comfort and resilience. In the event of a power or fuel supply outage for prolonged periods of time, a resilient building design will maintain liveable indoor temperatures and critical life-support functions.

⁵ World Green Building Trends 2018 SmartMarket Report
<https://www.worldgbc.org/sites/default/files/World%20Green%20Building%20Trends%202018%20SMR%20FINAL%2010-11.pdf>

FIGURE 2: MOST IMPORTANT BENEFITS OF GREEN BUILDING. RESPONDENTS WHO SELECTED EACH BENEFIT AS ONE OF THE MOST IMPORTANT IN THEIR MARKET



Source: Dodge Data & Analytics, 2018



A Net Zero Energy (NZE)

home produces at least as much energy as it consumes every year. In a NZE home, the energy produced is generated on-site and is renewable.

NET ZERO AND ENERGY EFFICIENCY:

Over the course of a year, the energy supplied to the grid balances the energy taken from the grid, which results in net-zero annual energy consumption. Before becoming a NZE home, a house can be considered NZEr (NZE ready). NZEr homes comply with NZE principles, but without having installed the renewables. In 2006, CMHC initiated the Equilibrium program to "...demonstrate the net-zero annual energy target using modelling principles". Designs involved in the program were required to achieve an Energuide Rating System target of 82, with renewable power generating equipment required to reach an Energuide rating system target of 90 (approaching net-zero), and a final goal of Energuide Ratings System 100, considered to be fully net-zero.

While there is a clear focus on energy efficiency and renewable energy generation in NZE homes, buildings with technologies and building methods related to NZE may experience enhanced thermal comfort and indoor air quality benefits. However, as outlined above, discussion related to implementation of high efficiency homes, including NZE, have included consideration for increased risk of overheating.

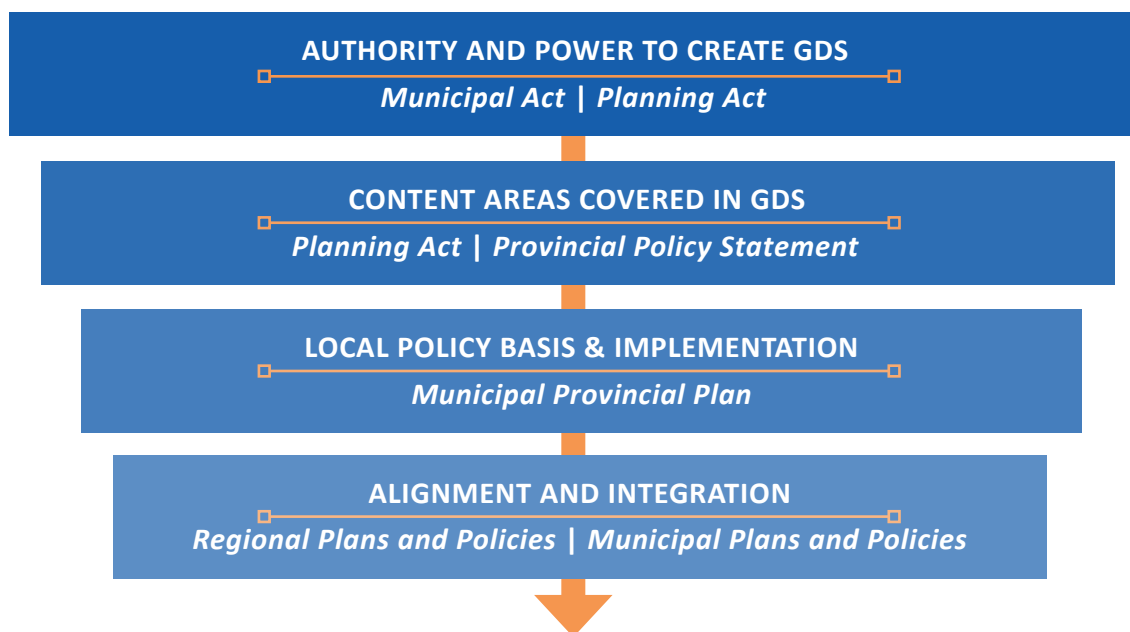
2.0 | LEGISLATIVE AND POLICY FRAMEWORK



KEY TAKEAWAYS:

- » Municipalities across Ontario have tools available to them to support better performing buildings and well-designed communities. Several pieces of provincial legislation, including the Municipal Act, the Planning Act, and the Provincial Policy Statement, provide the underlying policy framework that supports the development and application of green development standards.

FIGURE 3: LEGISLATIVE FRAMEWORK FOR GREEN DEVELOPMENT STANDARDS



Source: Clean Air Partnership, 2019

2.1 | THE PLANNING ACT

The Ontario Planning Act, R.S.O. 1990 provides municipalities with authority to mandate sustainable urban design through site plan approvals.

The Planning Act provides a framework and legislative authority for municipalities to engage in land-use planning by creating Official Plans, Zoning By-laws, and Community Improvements Plans. Municipalities, in carrying out their responsibilities under the Planning Act, must have regard to matters of provincial interest. Section 2 of the Planning Act sets out these interests, which include:

- » The conservation of natural resources.
- » The supply, efficient use and conservation of energy and water.
- » The minimization of waste.
- » The orderly development of safe and healthy communities.
- » The promotion of development that is designed to be sustainable, to support public transit and to be oriented to pedestrians.

These interests give a clear indication of the kinds of issues municipalities should consider when creating policies and plans. These interests, coupled with the powers provided to municipalities in the Act, support them in implementing GDS.

For example, Section 41 of the Planning Act provides powers for site plan control including exterior sustainable design features for buildings. A municipality may pass a Site Control by-law, which can be used to ensure that any development meets certain standards and regulations. Site plan control allows municipalities to create functional street and landscapes, and influence the design of development sites, including considering external building design details. Many components of a GDS relate to these areas. This has been used in some municipalities to require an energy modeling report in order to achieve better energy efficiency, where the building envelope is considered as part of exterior design.

The Planning Act also requires that municipal land use decisions be consistent with the 2014 Provincial Policy Statement (PPS).

The PPS provides policy direction on matters of provincial interest related to land use planning and development and all decisions affecting planning matters must be consistent with the PPS. The PPS reflects the increasing awareness of the need for sustainable development and the need to plan for resiliency in the face of climate change. According to the PPS, sustainable development is supported through land use patterns that:

- » Promote compact form and a structure of nodes and corridors.
- » Promote the use of active transportation and transit in and between residential, employment and institutional uses and other areas.
- » Focus major employment, commercial and other travel intensive land uses on sites which are well served by transit where it exists or is to be developed, or design these to facilitate the establishment of transit in the future.
- » Improve the mix of employment and housing uses to shorten commute journeys and decrease transportation congestion.

- » Maximize vegetation within settlement areas where feasible.
- » Promote design and orientation which:
 - ▮ Maximizes energy efficiency and conservation and considers the mitigating effects of vegetation.
 - ▮ Maximizes opportunities for the use of alternative or renewable energy systems.

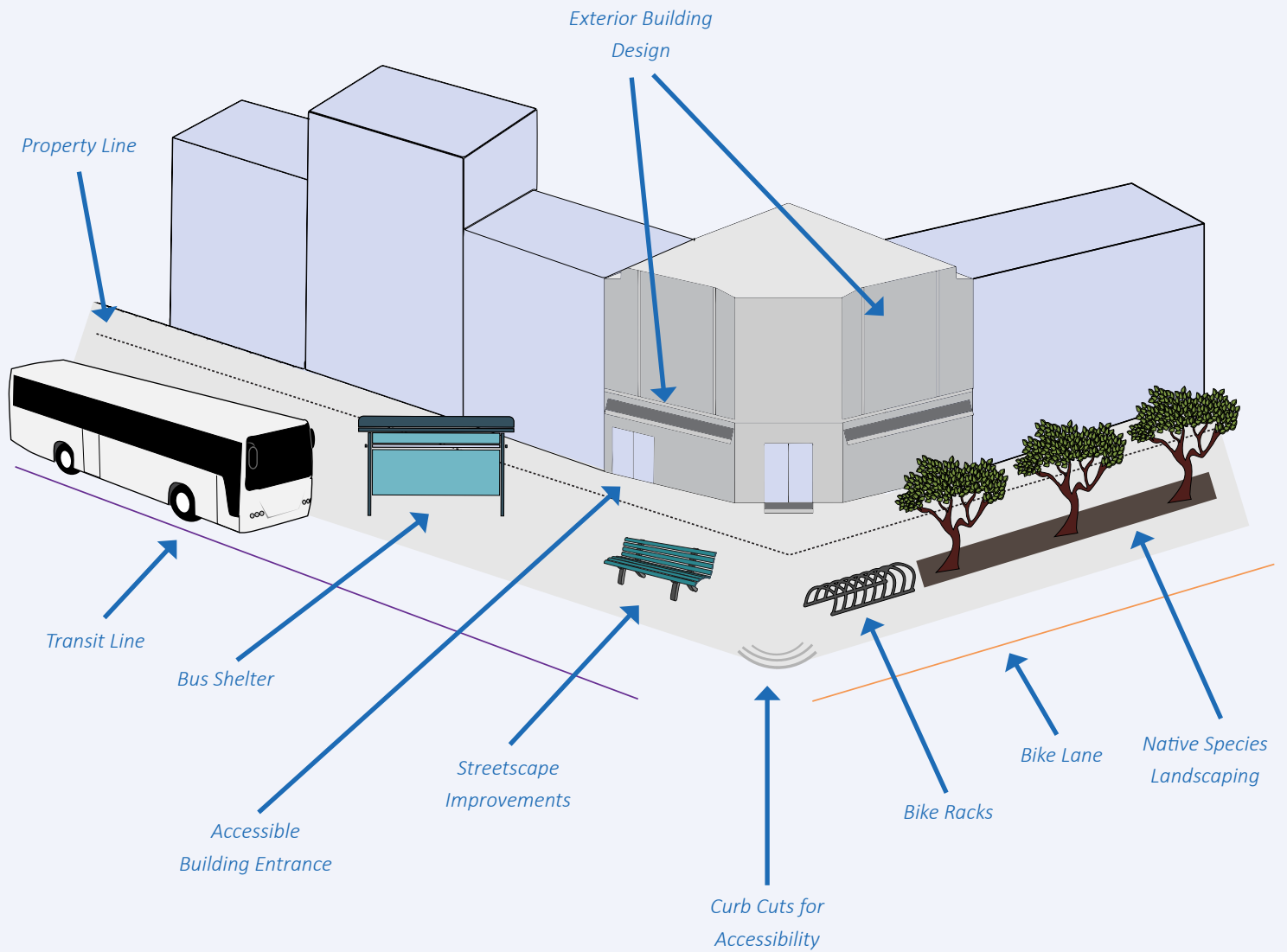
The PPS also addresses sewer, water and stormwater servicing, promotes water conservation, and establishes the need for the protection of water resources and quality.

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Several sections of the Planning Act allow municipalities to incentivize sustainable development. See Section 11 for more information on incentive tools.

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FIGURE 4: SITE PLAN CONTROL



Source: Planning by Design: a healthy communities handbook produced by the Ontario Ministry of Municipal Affairs and Housing, 2009

2.2 | THE MUNICIPAL ACT

The Municipal Act is the primary piece of legislation applicable to municipalities and sets out the roles and responsibilities of municipal governments in Ontario. The Act is a legislative framework for municipalities that recognizes municipalities as responsible local governments with a broad range of powers.

Recent updates to the Municipal Act and the City of Toronto Act through the Modernizing Ontario's Municipal Legislation Act, have provided more clarity on the municipal authority to develop standards for green development.

The Municipal Act outlines the scope of municipal powers, including the ability for a municipality to pass by-laws respecting various matters. Recent changes added the ability to pass a by-law respecting the economic, social and environmental well-being of the municipality, including respecting climate change. More specifically, Section 97.1 addresses standards for the construction of buildings, whereby a municipality may pass a by-law respecting the protection or conservation of the environment that requires buildings to be constructed in accordance with provisions of

the building code under the Building Code Act, 1992. Municipalities also have the power to require the construction of green roofs or of alternative roof surfaces that achieve similar levels of performance to green roofs. Finally, municipalities may provide for or participate in long-term energy planning for energy use in the municipality.

2.3 | THE ONTARIO BUILDING CODE

The Building Code Act, 1992 is the legislative framework governing the construction, renovation and change-of-use of a building in Ontario. The Ontario Building Code (OBC) is a regulation under the Building Code Act, which establishes technical requirements and minimum standards for building construction.

The main purpose of the OBC is the promotion of public safety through the application of uniform building standards. Thus, municipalities cannot rely solely on OBC minimum requirements in order to achieve their environmental goals and build better communities.

The OBC defines the level of performance buildings are required to meet through the Supplementary Standard SB10, with the goal of increasing efficiency over time.

For context, in 2012 the SB-10 became 15% more efficient than the 2006 version, and in 2017 became 13% more efficient than 2012. These levels of efficiency are intended to increase every four years. The most recent proposed changes to the current Code, intended to step the requirements of new houses and large buildings towards net-zero, but these have not come into effect.

The OBC standards are adjusted to match industry adoption and best practices in energy and water conservation. As such, any public or private guidelines that are based on, or reference, energy efficiency measures prescribed by the OBC should be seen as living documents and should be reviewed on a regular basis to ensure that changes to the OBC are taken into account.

As noted above, recent changes to the Planning Act and Municipal Act demonstrate that municipalities have authority beyond the OBC when it comes to shaping their communities. These pieces of legislation provide for municipalities to address a range of environmental and health priorities at a community design level.

2.4 | THE GROWTH PLAN FOR THE GREATER GOLDEN HORSESHOE

The Growth Plan for the Greater Golden Horseshoe, 2019 (Growth Plan) provides strategic direction for growth management across Ontario, particularly how and where to grow. The Growth Plan was conceived out of a provincial desire to create communities that support economic prosperity, protect the environment, and achieve a high quality of life. More specifically, the Growth Plan advances policies related to human health and active living, equitable housing opportunities, sense of place, access to parks and open space, sustainable stormwater management, urban agriculture, active transportation, waste management, and low-carbon communities.

The Growth Plan supports maximizing the use of efficient infrastructure. It also allows for Major Transit Station Areas (MTSAs), which are areas around major transit stops that are required to be planned to accommodate higher intensity mixed-uses.

2.5 | REGIONAL POLICY STATEMENTS

Municipalities in Ontario that are part of two-tiered government structures may have some unique opportunities for coordinating sustainable development. Upper-tier municipalities generally set high-level policies, and may have some mandatory policies. Lower-tier municipalities would have to comply with any upper-tier mandated policies. However, lower tier municipalities generally have the power to set more specific policies and stricter requirements than their upper-tier counterparts.

Upper-tier municipalities create regional Official Plans and other policies that direct land-use and sustainability decisions. Lower-tier municipalities can implement these goals in their own plans, including through the use of GDS. If the upper-tier municipality has created regional strategic plans, community energy plans, or climate resilience plans, these can provide rationale for many metrics that would be included in a GDS. In cases where the lower tier municipality shares certain responsibilities with its upper-tier municipality, additional coordination between the two levels of government may be required.

Upper-tier municipalities have the opportunity to influence land use and the built form in all of their lower-tier municipalities. For example, York Region's Official Plan recognizes that building sustainable communities includes integrating land use and the built form. The policies of the Official Plan ensure that sustainable buildings are a key component of York Region's communities. The built form plays a major role in supporting the sustainability vision for the Region, by conserving more energy and water, supporting local industry by buying materials locally, and providing healthier indoor environments. The Region is committed to demonstrating leadership in the areas of energy and water conservation in buildings.

Some of the specific policies in the York Region Official Plan are:

- » To encourage local municipalities to undertake municipal-wide Community Energy Plans.
- » To work with local municipalities and the development community to achieve energy efficiency levels that exceed the Ontario Building Code for residential buildings, and the Model National Energy Code for non-residential buildings.

- » To work with local municipalities and the development community to achieve 10 per cent greater water conservation than the Ontario Building Code (as amended to O. Reg. 315/11, January 1, 2012) for all new buildings.
- » To regularly review and update sustainable building incentive programs within York Region together with local municipalities. These programs may include water and wastewater servicing allocation credits, density bonusing, expedited processing of development approvals or the use of local municipal community improvement plans and associated financial tools.
- » That development shall include a solar design strategy which identifies approaches that maximize solar gains and facilitate future solar installations (i.e. solar ready).
- » To require local municipalities to develop programs to ensure the successful implementation of the sustainable building policies of this Plan. 5.2.41.
- » To support local municipal initiatives in sustainable community planning and sustainable building policy and implementation to achieve building standards greater than the policies of this Plan and the Ontario Building Code. 5.2.42.

Upper-tier governments may also provide incentives that can be incorporated into the GDS.

For example, York Region has two incentive programs: Sustainable Development Through LEED® and the Sustainable House Incentive Program, which provide incentives for high density residential and grade-related residential development constructed to LEED® standards. Development can qualify for water and wastewater Servicing Allocation Credits within the proposed development that can be used to reduce the required allocation from the local municipality and/or to facilitate planning approvals for additional units on a site.

2.6 | MUNICIPAL OFFICIAL PLAN AMENDMENT

An Official Plan describes the upper, lower, or single-tier municipal council's policies on how land in the community is to be used. Official Plans are created with input from the community and ensure that future growth is coordinated and meets the community's needs. Land use planning helps a community to determine how it can achieve its goals for growth while balancing social, economic, and environmental concerns.

For municipalities seeking a starting place for developing and implementing green development standards, it is crucial to incorporate language on green development standards into the Official Plan through an Official Plan amendment or through the Official Plan review process.

Municipalities can use their Official Plan as a tool for providing high-level strategic direction on land-use planning issues. The Plan can push development towards compact, walkable built form, and can promote environmental protection through the promotion of energy and water conservation and efficiency and sustainable building and site design practices.

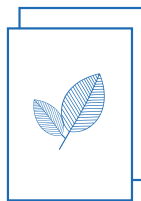
For example:

- » ***The City of Richmond Hill's Official Plan*** describes sustainable design policies that are meant to integrate the built and natural environment and enhance the City's environment. It provides a policy that the City will develop sustainable design criteria that are consistent with and implement the sustainable policies of the plan, and requires that these criteria are updated periodically (see Richmond Hill Official Plan 3.2.3 Sustainable Design).
- » ***The City of Toronto's Official Plan, Chapter 5*** specifies that Site Plan Control is a means to implement the OP policies including sustainable development, as the entire city is a Site Plan Control area. The OP also specifically names the Toronto Green Standard in the implementation section, as a method to achieve environmentally sustainable development. The City considers the sustainable design elements of buildings, and uses the City of Toronto Act to secure certain sustainable design features in development.

» **The City of Markham's new Official Plan**, which is not yet in force, also refers to a sustainable development checklist which would apply sustainable design practices and technologies in site planning and building design. In particular, the Official Plan states that a sustainable development assessment checklist will ensure that consideration is given to a full range of options to incorporate sustainable approaches in the development approval process. The goals of this checklist include promoting energy conservation and renewable energy, encouraging the use of environmentally preferable building materials, and encouraging walking, cycling, and transit use.

» **The Town of Halton Hills' Official Plan** specifies that development applications must comply with its Green Development Standards. These standards implement the Official Plan's goals and strategic objectives around energy conservation, water conservation and quality, natural environment quality, air quality, transportation and community design, communication, and waste management.

3.0 | THIRD PARTY GREEN BUILDING AND SITE PROGRAMS



KEY TAKEAWAYS:

- » Green Development Standards cover a range of sustainable design features for communities — like tree maintenance, stormwater quality, and green buildings and sites. Green buildings and sites are one component of a municipality's GDS that has the potential to significantly impact GHG emissions. Over the last decade green building certification programs have raised the bar for energy-efficiency, renewable energy and sustainability practices and, as a result, have changed the way buildings are designed, constructed, maintained, and operated.
- » A municipality that is looking to implement GDS does not need to start from scratch. There is a wealth of information, resources, and standards to advance green buildings and sites. Third Party rating systems are well-established and recognized in the global building community. Using third party rating systems allow builders to create better performing buildings, gives them marketing and competitive advantages, and provides third-party verification that buildings are green.

KEY TAKEAWAYS (CONTINUED):

- » Municipalities that want to achieve significant GHG reductions from buildings can do so by looking towards incorporating performance based approaches to energy efficiency such as those in Passive House or Net-Zero programs to their energy efficiency metric. Without these standards, advancing significant reductions in building emissions will be extremely difficult to achieve. It is not recommended that municipalities mandate these certifications for all new buildings — however, builders/ developers should continue to be encouraged to join these programs actively. Municipalities can play a role in offering support to builders and developers to learn from these standards while they are still voluntary, as net-zero energy will likely be targeted for code by government agencies in the future.

FIGURE 5: OVERVIEW OF CANADIAN GREEN HOUSING PROGRAMS



Source: FCM/GMF Feasibility Study: Municipal Tools for Catalyzing Net-Zero Energy Development by Derek Satnik, s2e Technologies Inc.

3.1 | LEED

Leadership in Energy and Environmental Design® (LEED) is a rating system that is recognized as the international mark of excellence for green building in over 160 countries. LEED is a checklist based family of green building certification programs managed by the Canada Green Building Council (CaGBC). LEED is one of the most established and globally recognized programs for green buildings. LEED has recently launched an updated set of requirements across its portfolio of programs (now version 4), and is tending towards increased focus on carbon, increased collaboration with other programs like EcoDistricts, Living Building Challenge, and Passive House, and overall increased impact on measurable objectives.

LEED certification does not specifically ensure a focus on energy performance. The LEED systems include both mandatory and optional measures, and the most cost-effective way to be successful in the LEED program is typically through the energy credits. There are very few mandatory measures related to energy, and once they are achieved there is no significant means by which to ensure that LEED projects will prioritize energy over any other topic in

the LEED program. LEED recognizes and awards environmental performance with tiered certification achievements, from LEED Certified up to Silver, Gold, and ultimately Platinum. LEED Platinum buildings are typically very energy efficient, but not net-zero energy. LEED Certified is similar to Energy Star, whereby a high building energy performance is achieved, but buildings are still a long way away from net-zero energy or net-zero emissions.

LEED for Neighborhood Development (LEEDND) is a rating and certification system for neighborhood design that combines the principles of smart growth, urbanism and green building. LEED-ND v4 has five areas of focus: Smart Location and Linkage, Neighbourhood Pattern and Design, Green Infrastructure and Buildings, Innovation, and Regional Priority. To qualify for LEED ND certification, a project site must comprise more than 10 acres and more than three buildings. In scenarios where buildings are separately owned, all owners must agree to complete one LEED-ND application together. At least one building is also required to achieve LEED BD+C certification. LEED benefits from international recognition and name familiarity, and many developers and land owners have some degree of familiarity with the system.

3.2 | ENERGY STAR, R-2000

[Energy Star](#) is managed in Canada by Natural Resources Canada (NRCan), and by the Environmental Protection Agency in the U.S. It is one of the most reputable brands in the world, and known by the public as a high quality standard. ENERGY STAR products of any kind, from fridges to homes, are typically 15-20% more efficient than their competitors. ENERGY STAR is an established program that has had and continues to have significant impact on the market.

R-2000 was launched by NRCan in the 1980's as the housing standard of the future and was exported internationally as a building science program that became the ENERGY STAR for New Homes program in the US, and the Passivehaus program in Germany. ENERGY STAR has been updated periodically over the past decade in Canada until it offered very similar performance results to R-2000. R-2000 has recently been updated to achieve a "Near Net Zero" level of performance, approaching 50% more efficient than building code compliant homes.

3.3 | ENERGUIDE

The [EnerGuide Rating System](#), delivered by Natural Resources Canada, estimates the energy performance of a house. It can be used for both existing homes and in the planning phase for new construction. It allows building professionals to provide consumers with information to help with their home purchase decisions and to choose the best renovations to maximize savings on their energy bills.

The EnerGuide rating scale gives you a consumption-based rating measured in gigajoules per year (GJ/year), so that homeowners are able to see their score using units of energy similar to consumption ratings of kilowatt hours per year for home appliances, and miles per gallon for vehicles. A home's EnerGuide rating calculation helps you understand your energy sources and the math that produced your home's rating. The rating scale is easy to understand; the lower the number, the better energy performance of the home.

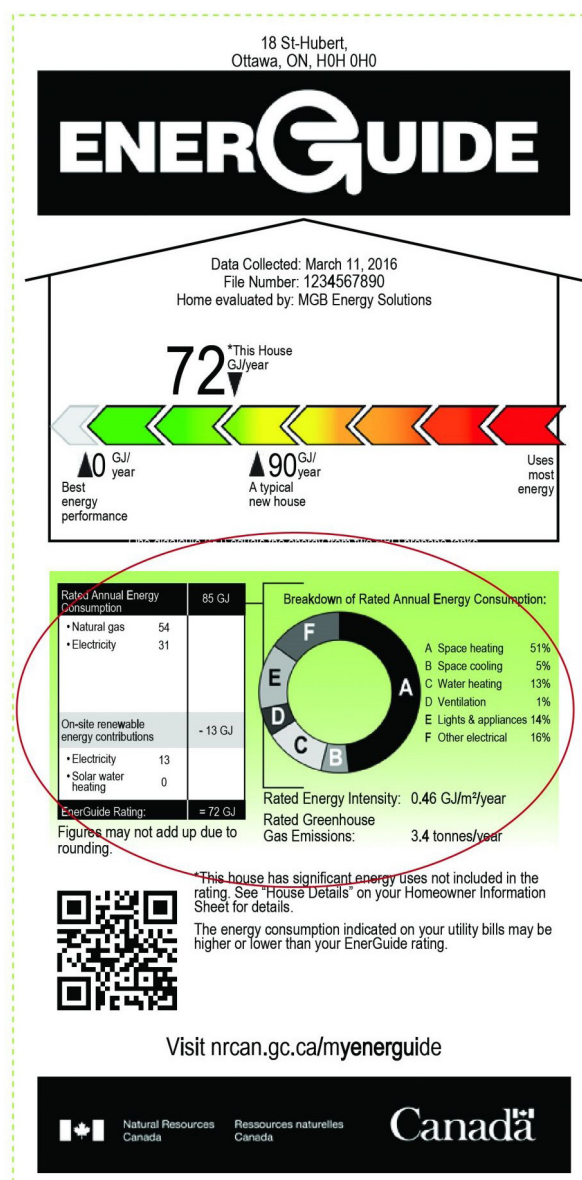
Energy advisors who work with licensed service organizations perform EnerGuide home evaluations that can help homeowners make informed decisions about most effective energy efficiency renovations that may save them the most on utility bills. Builders may work with energy advisors in the planning phase of construction and get their plans evaluated to determine the most cost-effective upgrades to increase energy efficiency of the home, resulting in savings for the homebuyers.

3.4 | PASSIVE HOUSE

The [Canadian Passive House Institute](#) is a certifying body for passive house standards, an energy-based green building program that uses a performance approach to energy efficiency. Using the Passive House design principles in building results in homes that consume up to 90 percent less heating and cooling energy than conventional buildings.

Passive House (Passivhaus) certification system focuses on passive design to optimize the building envelope to maintain heat and lower heating energy consumption.

FIGURE 6: ENERGUIDE LABEL



Source: Natural Resources Canada, 2019

Focus areas include super-insulation, air tightness, high performance windows, efficient heat recovery ventilation, minimizing thermal bridges, source energy limit, and space conditioning criteria. Although applicable to all building types, to date, the Passive House system has primarily been pursued by residential buildings, although a slow expansion to larger commercial buildings is underway. The system has prescriptive energy use and air tightness requirements, which can result in high occupant comfort and low energy use.

Passive Homes, according to the institute, offer the following benefits for occupants:

- » Year-round stable indoor air quality and temperature.
- » Quiet and comfortable throughout the changing seasons.
- » Substantial reduction in energy use and operating costs.
- » Simple to use, durable systems.

To be a certified Passive House, a builder must engage an approved certifier at the start of a project, and ensure that an initial design review confirms that all drawings, specifications, and documentation meet the requirements of the Passive House standard. The main criteria for Passive House certification are:

- » Space Heat Demand max. 15 kWh/m²a OR Heating load max. 10 W/m²
- » Pressurization Test Result @ 50 Pa max. 0.6 ACH (both over-pressure and under-pressure)
- » Total Primary Energy Demand max. 120 kWh/m²a

Certifying a typical single family home costs between \$3000-\$5000, depending on size and complexity.

3.5 | CAGBC ZERO-CARBON BUILDING STANDARD

The Canada Green Building Council (CAGBC) has created a [Zero Carbon Standard](#) for assessing the carbon performance of commercial, institutional, and multi-family buildings in Canada. Unlike other standards, the CaGBC's Zero Carbon Building Standard focuses on carbon emissions reductions, rather than energy consumption. It is the only standard in North America that uses carbon as the key performance metric. A zero carbon building is defined as one that is highly energy-efficient and produces on site, or procures, carbon-free renewable energy in an amount sufficient to offset the annual carbon emissions associated with operations. These buildings achieve a net emissions balance of zero or less, which means that no net greenhouse gas (GHG) emissions are associated with building operations.

The Zero Carbon Building Standard provides a path for both new and existing buildings to reach zero carbon, with unique requirements for each. New construction and major retrofit projects earn Zero Carbon Building — Design certification by modeling a zero carbon balance, highly efficient envelope

and ventilation systems to meet a defined threshold for thermal energy demand intensity, and on site renewable energy systems capable of providing a minimum of 5% of building energy consumption. Project teams are required to evaluate energy use holistically, including impacts on peak electricity, and determine the GHG emissions associated with structural and envelope materials.

The focus of the program is on demonstrating a zero carbon balance in building operations year after year. Buildings that achieve a zero carbon balance and meet the other requirements for existing buildings earn Zero Carbon Building — Performance certification. This certification is awarded based on a twelve- month period of operations, and performance must be verified annually. Project teams are required to evaluate energy use holistically, including impacts on peak electricity, and determine the GHG emissions associated with structural and envelope materials. Recognizing the inherent challenges to retrofitting existing buildings, this certification does not require a minimum of on site renewable energy or a minimum level of thermal energy demand performance.

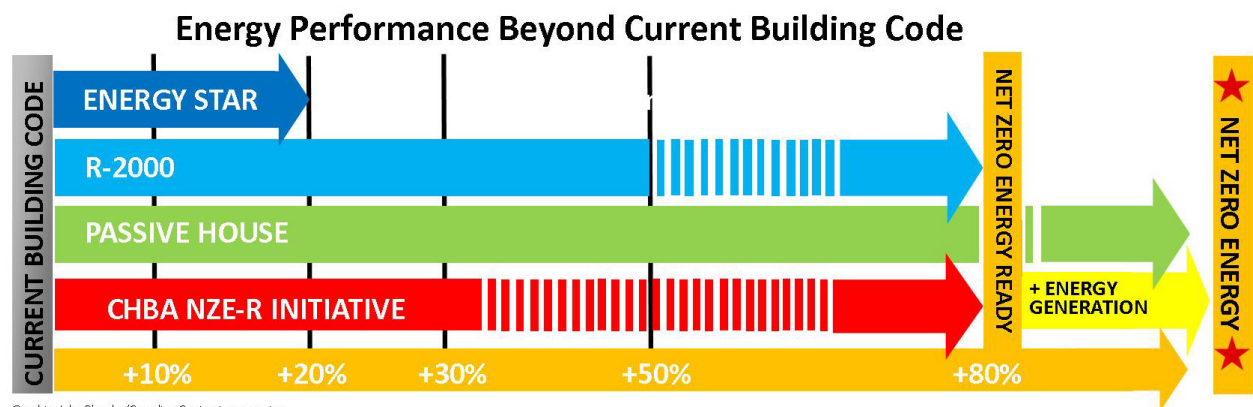
3.6 | CHBA NET ZERO HOME LABELLING PROGRAM

The Canadian Home Builders' Association (CHBA) created the Net Zero Home Labelling Program. The Program provides the industry and consumers with a clearly defined and rigorous two-tiered technical requirement that recognizes Net Zero and Net Zero Ready Homes, and identifies the builders and renovators who provide them.

The CHBA Net Zero Home Labelling Program has been designed so that a home could still qualify for Net Zero Ready, R-2000, or ENERGY STAR® if Net Zero isn't achievable.

Due to the energy production that is part of a Net Zero Home, its energy performance is 100% better than homes built to code.

FIGURE 7: MUNICIPALLY-DEVELOPED GUIDING PRINCIPLES



Source: Canadian Contractor Magazine, 2019

3.7 | LIVING BUILDING CHALLENGE

The [Living Building Challenge \(LBC\)](#) is a holistic performance-based standard for buildings that uses a regenerative design framework. Living buildings are self-sufficient within the resource limits of their site, and create a positive impact on the human and natural systems with which they interact. Its latest version has simplified the program so that the level of effort is aligned with impacts. The LBC consists of seven performance categories, or “Petals”: Place, Water, Energy, Health and Happiness, Materials, Equity and Beauty. The LBC is unique because it can apply to new construction, existing buildings, or interior projects.

The LBC goes beyond other third party systems in terms of both environmental and energy performance, with the idea to create buildings that improve the environment, rather than merely minimizing impact to it. The main difference is that LBC requires buildings to achieve every single imperative, unlike other rating systems which offer optional points in different categories. LBC requires operational data to prove net-zero

status, rather than theoretical energy efficiency. It also requires projects to use only water that arrives on site naturally, and requires that water to be treated on site and returned to its natural cycle. Thus, LBC requires net-zero water use. LBC also limits the types of materials that can be used in construction.

Ultimately, the LBC is a holistic approach to building that requires all project stakeholders to consider the real life cycle impact of design, construction, and operation.



Source: Shutterstock

4.0 | REVIEW OF GREEN DEVELOPMENT STANDARDS IN ONTARIO MUNICIPALITIES



KEY TAKEAWAYS:

- » In Ontario, local governments are the approval authority for new construction under the Planning Act, where they implement section 41 of this legislation in their review and approvals of applications. Thus, with this authority and their Official Plan, municipalities have a large influence on the quality and environmental performance of development. Many municipalities are starting to develop and implement GDS for this purpose.
- » In Ontario, many municipalities are using a “menu” of metrics approach that gives developers the option to pick from a list of measures and choose which they would like to implement. This approach is non-prescriptive, and often includes performance-based measures, such as Energuide ratings, rather than prescriptive measures that specify types of products or materials.
- » Of the municipalities in Ontario with green standards, the Toronto Green Standard currently represents the most ambitious approach to requiring builders to consider the energy performance of their buildings. It is aligned with the direction most industry, sustainable professionals, and governments globally are heading — towards net zero emissions buildings.

KEY TAKEAWAYS (CONTINUED):

- » The municipalities of Vaughan, Brampton, Richmond Hill, and Markham have taken a regional approach to GDS that reduces complexity for developers who work across their jurisdictions. By working together, they were able to share resources, reduce administrative complexity, and present a coordinated approach to engaging with their stakeholders.

TABLE 1: OVERVIEW OF THE STANDARDS CURRENTLY IN PLACE IN ONTARIO MUNICIPALITIES

	TORONTO	VAUGHAN/BRAMPTON/ RICHMOND HILL	HALTON HILLS
METRICS APPLY TO	All new development subject to the City's Site Plan Control Bylaw.	Brampton and Vaughan-metrics apply to Draft Plan of Subdivision, Site Plan, and Block plan Richmond Hill-metrics apply to Draft Plan of Subdivision and Site Plan.	Low Rise Residential, Low Rise Non-Residential, Mid to High Rise Residential.
REQUIREMENTS	Tier 1 is mandatory	Minimum number of points must be achieved (these thresholds are approved by council).	Minimum number of points must be achieved.
PATHWAY TOWARDS NET ZERO	Council approved absolute performance targets to zero emissions by 2030.	None currently	None currently
FINANCIAL INCENTIVE	Development Charge Refund Program for applications that meet Tier 2 or higher level of voluntary performance standards.	No	No

4.1 | THE TORONTO GREEN STANDARD

Context and Rationale:

The [Toronto Green Standard \(TGS\)](#) is a full set of environmental performance measures for sustainable site and building design. The TGS is considered a leading municipal green building policy in North America. The performance standards have been in effect since 2010 and include mandatory and voluntary performance levels or tiers implemented through development review, approvals and verification processes.

Main Policy Features:

The latest version 3 of the Toronto Green Standard sets out a four-tiered or stepped approach towards low impact, high performing sites and buildings. The TGS energy performance measures increase every four years. By 2030, today's Tier 4 level will be Tier 1 mandatory near zero emissions.

Targets and Requirements:

The TGS includes 4 tiers or levels of environmental performance across the five categories: air quality, energy efficiency/ GHG reductions/resilience, water efficiency/ quality, ecological design and solid waste reductions. As of 2010, Tier 1 performance

measures were a mandatory requirement of the planning approval process. Achieving the requirements of the higher tiers is voluntary. To demonstrate compliance, applicants are expected to submit a TGS Checklist, green project statistics, plans, drawings or reports at either or both the design stage and the construction stage. Tier 2 and above projects are third-party verified and certified in order to qualify for the Development Charge Refund where a portion of development charges are returned to the developer in exchange for a high performance site and building.

Key components of the TGS include its focus on sustainable design, landscapes, green infrastructure and bird-friendly design practices, high storm water retention, and energy performance requirements. To demonstrate energy performance, large buildings are required to submit a [Design Development Stage Energy Modelling Report](#) as proof of compliance. The policy basis for this requirement comes from Section 114 of the City of Toronto Act and s. 41 of the Planning Act, which provide authorities related to approval of drawings that show exterior building design.

Tools and Incentives:

Applications have the option of pursuing the voluntary Development Charge Refund Program, which offers a partial development charge refund to projects that have demonstrated higher levels of sustainable design by achieving Tier 2, 3 or 4 (Tier 1 is the required level of environmental performance) – beyond the required Tier 1 level of environmental performance.

Results:

The Toronto Green Standard has proven to be an effective tool to ensure new development is more sustainable and resilient and on target to achieve the City's greenhouse gas (GHG) emission reduction targets. Over 1,300 developments have been required to meet Tier 1 and 20 projects have been certified to Tier 2. Collectively these projects are set to achieve annual GHG emission reductions of an estimated 115,205 tonnes of CO₂e (carbon dioxide equivalent) compared to projects constructed to the Ontario Building Code.

Applicant Resources:

- » TGS Website

4.2 | VAUGHAN, BRAMPTON, RICHMOND HILL, MARKHAM SUSTAINABILITY METRICS

Context and Rationale:

The municipalities of Vaughan, Brampton, and Richmond Hill worked collaboratively to develop the [Sustainability Metrics Program](#), with consistent metrics across their municipalities. The program was developed to create cities with a sustainable built form, and implemented as part of the review of development applications. Since the program was developed, the municipality of Markham has recently joined their partnership. The partnership offered the following benefits:

- » Flexibility in developing municipal-specific Threshold scores and point allocations.
- » Consistency across partner municipalities.
- » Efficient and effective use of resources.
- » Assistance with communicating with council and staff.

Main Policy Features:

The Sustainability Metrics Program includes a menu of metrics that applicants can select from in order to make their development more sustainable, with each metric worth a certain number of points.

The Sustainability Metrics are organized into four categories that represent major elements of sustainable community development: Built Environment, Mobility, Natural Environment and Open Space, and Infrastructure and Buildings.

Targets and Requirements:

Applicants are required to achieve a minimum points threshold for their application. In Vaughan, council has an expectation that the minimum is achieved outside of the Vaughan Metropolitan centre area, and a higher score achieved within the centre. Applicants are expected to submit a sustainability score and summary letter with submissions.

Brampton, Richmond Hill, and Vaughan have all instituted three levels of sustainability related to the sustainability score achieved. Brampton and Vaughan have defined these levels as bronze, silver, and gold, whereas Richmond Hill defines them as good, very good, and excellent. Brampton and Vaughan use the metrics program for draft Plan of Subdivision, Site Plan, and block plan applications, whereas Richmond Hill only uses it for Draft Plan of Subdivision and Site Plan applications. In all three municipalities, applicants are expected to achieve the

base level performance, however defined, for their application to be considered.

Tools and Incentives:

There are no financial incentives currently being used in any of these municipalities. However, applicants are encouraged to explore incentives offered by other entities, such as the Savings by Design Green Building Initiative offered by Enbridge Gas Distribution. Both Richmond Hill and Vaughan are using servicing allocation as an incentive for sustainability metrics.

Applicant Resources:

- » Guidebook and Glossary
- » Metrics Table
- » Sustainability Scoring Tool
(webform or Excel tool) Manual

4.3 | HALTON HILLS

Context and Rationale:

[The Halton Hills Thinking Green Development Standards \(TGDS\)](#) apply within the Town's urban boundaries to applications for new low-rise residential, low-rise non-residential, and mid to high-rise development of all types. The Green Development Standards utilize a checklist approach (similar to

Vaughan, Brampton, and Richmond Hill) whereby applicants can choose the most appropriate criteria for the project, so long as a minimum point threshold is achieved.

The Halton Hills Official Plan contains policy requiring compliance with the Green Development Standards; policy C19.1 notes that a development application will only be deemed to have met the Town's sustainability goals if it meets the requirements of the Green Development Standards adopted by Council, and as amended from time to time, to provide detailed direction for the implementation of this policy. It is expected that applicants will engage with staff early in the pre-application process to maximize green benefits.

Main Policy Features:

The checklists criteria are organized into seven categories: energy conservation, water conservation and quality, community design, air quality, innovation and other green features, waste management, and communication.

Targets and Requirements:

The Green Development Standards comprise required and voluntary points, depending on the criteria. Proponents must meet a

minimum required point threshold (around 40% of the total points available). Using a LEED-like approach, the criteria are rated on both the significance of the environmental benefits and the difficulty or cost associated with implementation. The checklists criteria are organized into seven categories: energy conservation, water conservation and quality, community design, air quality, innovation and other green features, waste management, and communication.

Tools and Incentives:

The Town has produced checklists for low-rise residential, low-rise non-residential, and mid to high-rise (any use) projects. While the Town does not directly offer incentives for achieving higher performance, it does encourage applicants to contact Halton Hills Hydro, Union Gas and the Independent Electricity System Operator (IESO) regarding current energy incentive programs.

Applicant Resources:

- » Green Development Standards Checklist
- » Green Development Standards Study
- » Green Development Standards Information Guide

4.4 | DURHAM REGION RESILIENT HOUSE STANDARD

Context and Rationale:

Durham Region has developed a draft [Durham Region Climate Resilience Standard for New Houses](#) that is aimed at increasing the resilience of low-rise residential buildings to current and future extreme weather conditions. It has not yet been adopted.

The Standard presents measures that are applied on the private-side of the property line, including measures that relate to buildings/building footprints and private yards/landscaping. The measures complement existing provincial, conservation authority, and municipal (upper- and lower-tier) requirements related to location, design, construction and inspection of low-rise residential buildings and lots. The Standard does not repeat provincial or municipal requirements that are already in place and serve to reduce risks associated with extreme rain, wind and heat (e.g. anchoring of buildings to foundations, restricting connection of foundation drainage to sanitary sewer systems, protection of homes from riverine flood hazards); rather, the Standard serves to fill gaps in existing building and lot design requirements.

Targets and Requirements:

The Standard addresses Ontario Building Code (OBC) Part 9 residential buildings with a focus on increasing resilience for the following:

- » Basement Flooding
- » Extreme Wind/Tornados
- » Extreme Heat

Tools and Incentives:

At the time of writing, this standard is still in draft form and has not been adopted.

PART II:

MILESTONE FRAMEWORK FOR GREEN DEVELOPMENT STANDARDS IMPLEMENTATION



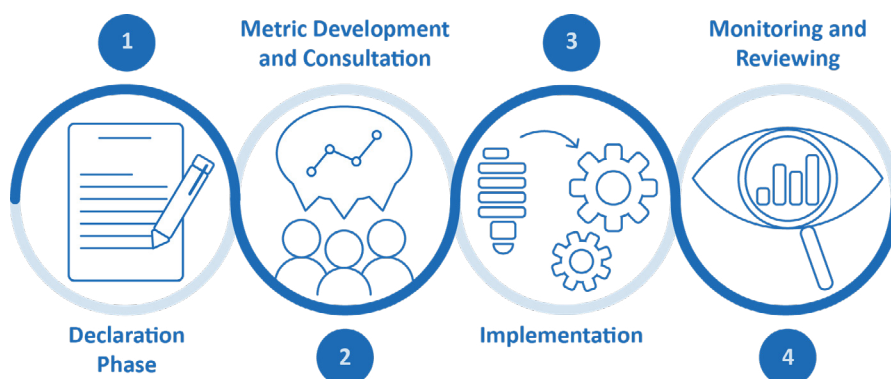
5.0 | THE GREEN DEVELOPMENT STANDARDS MILESTONE FRAMEWORK

- » The following Milestone Framework has been created to help you take action on creating Green Development Standards in order to reduce greenhouse gas emissions associated with development in your community.

- » **Milestone 1:** Declaration Phase
- » **Milestone 2:** Metric Development and Consultation
- » **Milestone 3:** Implementation
- » **Milestone 4:** Monitoring and Reviewing

- » Key actions and processes involved in each Milestone are described in the following chapters. Some milestones have several key tasks and considerations.

FIGURE 8: GREEN DEVELOPMENT STANDARDS MILESTONE FRAMEWORK



Source: Clean Air Partnership, 2019

6.0 | MILESTONE 1: DECLARATION PHASE



-
- » In Milestone 1, the municipality has made the decision to develop a GDS to be integrated into their planning approvals process, and this commitment is supported and passed through council.
-

THERE ARE TWO KEY STEPS IN MILESTONE 1:

1) *Establishing a working team and roles in order to build the business case for the project.*

2) *Identifying objectives of the project and ensuring alignment with current policies.*

6.1 | STEP 1: ESTABLISH A WORKING TEAM AND ROLES IN ORDER TO BUILD THE BUSINESS CASE FOR THE PROJECT

Develop a business case for GDS in your municipality, including environmental, economic, and social benefits of GDS for your community. Create a strong value proposition, aligned with other plans and policies, and communicate your proposal to council in order to receive direction to explore options and recommendations.

- » Many of the benefits of GDS are described in Chapter 1.
- » Use other municipalities' accomplishments as examples to meet or exceed.

Note: Climate change terminology alone is unlikely to influence key decision makers. It is important to consider not only the economic benefits of climate change-ready land use planning and development, but also what it will cost the municipality to not have GDS. Similarly, when communicating with developers, ensure that messaging focuses on cost-effectiveness.

Establish a working team comprising staff from various departments, including: planning, urban design, engineering, environment, finance, legal, building, public health, forestry, and any other relevant departments. Interdepartmental coordination is crucial for creating GDS. Many departments will need to be involved in reviewing development applications and verifying compliance of the sustainability metrics, thus their early involvement is key. This will create a sense of ownership of the program and ensure that the metrics are realistic and feasible.

Find your champions/success stories.

- » Involve a diverse array of staff early in the process.
- » Clearly articulate internal and external roles.

Build on an existing process and enshrine in Official Plan.

- » Weave GDS into an existing planning process.
- » Do not overwhelm staff, implement practices slowly.

Building of Metrics through internal workshops.

- » Involve interdepartmental teams throughout the process.
- » Understand your current practices, including what needs to be improved.
- » Ensure continuous training and re-training to address turnover.

Create a Terms of Reference and workplan for the project.

- » Create a vision, goals, and guiding principles for the project.
- » Delineate roles for all relevant parties: council, development applicant, development planner, design team, other internal staff.
- » Map out the relevant stakeholders and create an engagement plan with timelines.

6.2 | STEP 2: IDENTIFY OBJECTIVES AND CURRENT PRACTICES AND ENSURE ALIGNMENT

Identify where sustainability is already embedded in municipal plans and requirements. Municipalities already use numerous plans, criteria, or strategies to address sustainability and built-form in their communities. The visions and goals in these documents can be implemented through an integrated set of GDS, which can also help to break down interdepartmental silos. Therefore, a municipality should ensure that their GDS are created with specific goals that are aligned with these wider community goals. For example, a municipality may have an existing sustainability master plan with a vision for creating a sustainable future by addressing environmental, cultural, social, and economic issues. GDS can help achieve this vision by ensuring that new development efficiently uses existing infrastructure, which provides savings to taxpayers.

The following are the types of plans that may provide both a policy basis and alignment for creating a GDS:

- » Community Energy Plans
- » Community and Sustainability Master Plans
- » Parks, Recreation, Culture, Library Facilities and Services Long-term Plans
- » Pedestrian, Bicycle, or Active Transportation Plans
- » Heritage Conservation Plans
- » Urban Forest/Forest Management Plans
- » Waste Management Plans
- » Transportation Master Plans
- » Engineering Design Criteria
- » Parking Standards
- » Stormwater/Storm Drainage Plans
- » Accessibility Plans
- » Urban Design Guidelines/Standards
- » Soil Management Plans
- » Water Protection Plans
- » Climate Adaptation Plans
- » Community Energy Plans
- » Other Plans and Guidelines

Ensure the GDS project is aligned with other on-going sustainability initiatives and major projects across the corporation. Compare the timelines for your GDS project and ensure alignment with other projects, including any upcoming Official Plan reviews.

Identify where your municipality would like to be with GDS by comparing current practices with a desired future state. There are different approaches to creating a GDS. Your municipality should determine the following characteristics of your GDS:

- » Will the GDS use a prescriptive or performance-based approach?
- » Will the GDS be voluntary, or have mandatory components (or elements of both)?
- » Will the GDS apply to residential, commercial/industrial developments, and employment lands?

Identify the principles or framework that will lead the development of the GDS. In addition to considering other municipal policies, it is useful to create or identify the framework that will be guiding the development or review of GDS.

A useful framework should outline the goals and guiding principles of the project. The framework or principles can be those developed by the municipality internally, or existing frameworks created by third parties.

6.21 | MUNICIPALLY-DEVELOPED GUIDING PRINCIPLES

For example, the City of Toronto's Toronto Green Standard implements the city's climate action strategy, TransformTO, which is grounded in the idea that climate action benefits not only the environment, but can help to achieve multiple community-wide objectives. This idea is closely tied to the Inclusive Climate Action program by C40 Cities which is focussed on "ensuring that efforts to address climate change help create sustainable cities for all". Toronto uses the TransformTO guiding principles when designing and delivering climate actions in order to ensure that the transition towards a low-carbon community maximizes public benefit and minimizes harms. The guiding principles are:

- » Advance social equity.
- » Protect low-income residents.
- » Improve affordability particularly for vulnerable population.

- » Enhance and strengthen the local economy.
- » Maintain and create good quality local jobs.
- » Improve public health.
- » Contribute to poverty reduction.
- » Create resilient communities and infrastructure.

Other municipalities have created their own set of guiding principles, based on their municipal priorities and long-term vision. For example, the cities of Vaughan, Brampton, and Richmond Hill use the following guiding principles:

- » Support the mix and diversity of land uses in a compact, transit supportive development form to help balance residential, employment and services and to improve active travel (i.e. walkability, transit use, etc.) between homes, workplaces, schools, and amenities.
- » Preserve the natural heritage system, urban agricultural and open spaces by directing development to existing communities.
- » Provide residents with access to locally grown food.

- » Provide for a range and mix of housing opportunities, choices, and accessibility for all income levels and needs.
- » Create walkable and connected communities with neighbourhood amenities and priority destinations within walking distance of residents. Enhance streetscapes to encourage residents to be physically active and socially engaged.
- » Provide a variety of economical, safe, and accessible mobility options through the provision of a connected network of streets, sidewalks, bicycle lanes, trails, and public transit systems.
- » Encourage the responsible use of resources to ensure long-term sustainability, reduce greenhouse gas emissions and demands on energy and water, and improved waste management.
- » Create jobs concurrent with residential growth to ensure a long-term balanced economy while encouraging live-work opportunities.
- » Ensure that growth and development is fiscally sustainable.
- » Optimize opportunities for infill, intensification, and revitalization.

- » Promote place-making that instills a sense of civic pride.
- » Preserve the City's rich cultural heritage through adaptive reuse and restoration.

6.22 | THIRD PARTY DEVELOPED GUIDING PRINCIPLES

Other municipalities are using existing frameworks developed by third parties. For example, the One Planet Living Framework is a sustainability framework developed by Bioregional, a social enterprise that planned and developed BedZED, the multi-award-winning ecovillage in South London, UK. The One Planet Living sustainability framework is comprised of ten principles and detailed goals and guidance, and is backed by science and years of hands-on experience. It is also a flexible framework that is helping organisations around the world to achieve their vision of a brighter, better future. The principles cover social, environmental, and economic sustainability. One Planet Living is unique in that it uses a holistic, person-centered perspective. Using a holistic sustainability framework can help guide a municipality towards designing GDS that not only achieve carbon reductions, but result in happy, healthy, and more equitable communities and places that people like to live.



TIP: Some municipalities have chosen to use the One Planet Living Framework in other municipal policies, such as the Official Plan and the Climate Change Plan, in addition to their Green Development Standards. This approach allows for consistent use and monitoring of the indicators associated with the framework.

FIGURE 9: THE TEN PRINCIPLES OF THE ONE PLANET LIVING FRAMEWORK

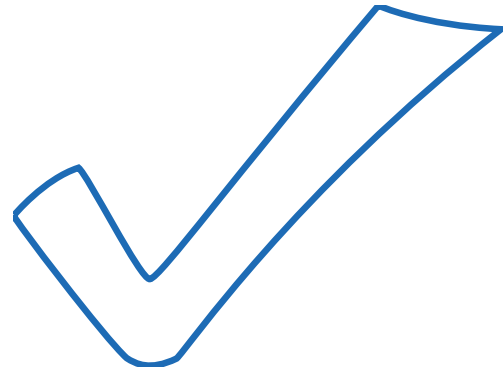
Health and happiness		Encouraging active, social, meaningful lives to promote good health and wellbeing							
Equity and local economy		Creating safe, equitable places to live and work which support local prosperity and international fair trade							
Culture and community		Nurturing local identity and heritage, empowering communities and promoting a culture of sustainable living							
Land and nature		Protecting and restoring land for the benefit of people and wildlife							
Sustainable water		Using water efficiently, protecting local water resources and reducing flooding and drought							
Local and sustainable food		Promoting sustainable humane farming and healthy diets high in local, seasonal organic food and vegetable protein							
Travel and transport		Reducing the need to travel, encouraging walking, cycling and low carbon transport							
Materials and products		Using materials from sustainable sources and promoting products which help people reduce consumption.							
Zero waste		Reducing consumption, re-using and recycling to achieve zero waste and zero pollution							
Zero carbon energy		Making buildings and manufacturing energy efficient and supplying all energy with renewables							

Source: <https://www.bioregional.com/one-planet-living>

6.23 | DESIGN PRINCIPLES FOR GOOD GREEN DEVELOPMENT STANDARDS

However a municipality chooses to frame their GDS, they should ensure that the metrics are user-friendly, clear, and produced collaboratively. Well- designed, successful examples of GDS use the following principles to guide their development:

- ☐ Ensure that tools are easy to use (e.g. A checklist, web-form scoring tool).
- ☐ Consider whether performance-based or prescriptive metrics will help your municipality achieve its goals.
- ☐ Define the desired sustainability performance threshold (if there are mandatory components or compliance thresholds, define what level must be achieved).
- ☐ Do not reinvent the wheel — there are many examples of good green development standards used in other jurisdictions already, as well as third party sustainability systems.
- ☐ Seek opportunities for cost efficiencies — collaborate with other municipalities to research, consult, and develop metrics. Partnerships between municipalities can also be used to apply for external funding (such as FCM grants, or grants from other sources).
- ☐ Level the playing field — developers want consistency.
- ☐ Provide some flexibility, such as through a tiered or menu approach.
- ☐ Conduct engagement throughout the process, with internal and external factors.



7.0 | MILESTONE 2: METRIC DEVELOPMENT AND CONSULTATION



-
- » Once a municipality has decided to develop a GDS, the next step is to conduct its analysis, and engage in internal and external consultation in order to draft its GDS metrics.
-

THERE ARE THREE KEY STEPS IN MILESTONE 2:

1) *Conducting an analysis.*

2) *Developing Metrics.*

3) *Consulting with internal and external parties.*

7.1 | STEP 1: CONDUCT ANALYSIS

Conduct a background analysis, including a jurisdictional scan of other municipalities and third party sustainability systems in order to identify best practices in green development metrics.

- » See Chapters 2-4 of this Toolkit.
Much of this content can be included in your report.
- » Determine the priority themes and categories for your municipality with indicators and metrics for each.
- » If using a points system, allocate points for each metric and recommend compliance thresholds and minimum requirements. It is recommended that aspirational or voluntary targets are set above requirements according to legislation or policy.
- » Create structured internal processes for the periodic review of metrics to evaluate their effectiveness, and any opportunities for efficiencies and improvement.

7.2 | STEP 2: DEVELOP METRICS

Develop the key components of your GDS, including themes, indicators, and metrics. These should be aligned with the existing policies and guidelines/ framework that you considered in Milestone 1.

RESOURCE: *To help your municipality with this process, a sample list of Green Development Standard metrics for Low-Rise Residential Development can be found in Appendix A. These were created in consultation with a cohort of municipal staff in Vaughan, Guelph, Whitby, Toronto, Halton Hills, Clarington, Caledon, and Ottawa.*

7.2.1. | DEVELOPING THE COMPONENTS OF YOUR GDS

There are several components that make up the structure of a GDS.

Indicators are used by municipalities to identify the impacts of sustainability measures. Specific indicators can be developed for different plan types (i.e. Block/Secondary Plan, Draft/Neighbourhood Plan, Site Plan, and Building Plan). An example of an indicator is “energy consumption”.

Metrics are the outcome(s) that will be reported to define performance in an indicator. Metrics can be qualitative or quantitative. An example of a metric for the indicator “energy consumption” may be ekWh/m^2 .

The metrics can be applied at varying scales of development, including:

- » Secondary Plan/Block Plan
- » Draft Plan of Subdivision
- » Site Plan

Targets are the desired end-state or goal that the municipality commits to achieving for a particular metric. Targets are derived from current performance efficiencies, policies and external benchmarks. Targets can be separated into tiers of performance (e.g. The Toronto Green Standard) or hierarchical thresholds (e.g. Mandatory/Prescriptive, Recommended Minimum, Aspirational).

- » Voluntary targets, whether they are recommended or aspirational, should be set above thresholds that are required according to pertinent legislation and/or policy.
- » Targets may be higher for certain building types (e.g. high rise v. low rise) or for certain areas (intensification areas, MTSAs, City Centre, Downtown BIA, Urban Growth Centre, etc.).

See Appendix A for sample metrics.

TIPS:

Assigning Points: *Points (if used) should reflect a combination of factors: the difficulty of achieving the metric, and the municipality's priorities (such as GHG reduction potential).*

Setting Requirements above Code: *For certain components of a GDS, there may be some uncertainty as to whether the municipality is able to set requirements above the Ontario Building Code. The municipality's lawyers should be involved throughout the process to provide their opinion on the requirements. You may want to consider the use of incentives. One way to address this is through the use of incentives, which can encourage developers to design beyond the minimum requirements. See Section 11 for more information.*

7.3 | CREATING METRIC RESOURCES AND TOOLS FOR APPLICANTS

Aside from the metrics themselves, tools and materials should be created to support applicants in navigating and using the GDS.

7.3.1 | METRIC SCORING TOOLS

Creating a web-form for applicants to use provides a user-friendly way to navigate the GDS. If your municipality does not have this capacity, creating a dynamic Excel-based scoring tool makes it easy for applicants to update and conform to changing targets. The tool can differentiate by plan type (e.g. block plan, site plan), and users. The tool can be divided by categories or themes, depending on how the GDS are structured, and can provide scores to inform the applicant of their performance. The tool can also measure compliance against mandatory requirements. Using a dynamic tool also provides the opportunity to identify scenarios for plan improvements.

The City of Vaughan currently uses a dynamic Excel-based scoring tool. See this page for more information.

7.3.2 | GUIDEBOOK

Municipalities should create tools for applicants and municipal staff to help navigate the metrics and requirements. The Guidebook can provide a step- by-step guide on how to measure and comply with each metric. For example, the guidebook can provide the intent of the tool, which plans it applies to, and how to show compliance. They can also identify studies where the metric performance can be verified by reviews. The guidebook can provide further instructions, detailing how the applicant should quantify certain metrics. The guidebook also identifies the supporting information and calculations that should be included within the project submission material.

Examples of guidebooks that have been created can be found here:

- » [City of Vaughan Sustainability Metrics Guidebook](#)
- » [City of Richmond Hill Sustainability Metrics Guidebook](#)

7.4 | HOW TO DEMONSTRATE METRIC COMPLIANCE/ SUBMISSION REQUIREMENTS

Municipalities must update the current list of mandatory requirements as part of a complete application to include GDS submissions. Be sure to provide applicants with a checklist for what makes a complete application. The submission requirements to demonstrate compliance may include the following supporting documentation:

- » **A “Summary Letter”** that tells municipal staff where they can find the proof to verify the claims to have satisfied certain metrics. ([click here for an example letter Terms of Reference from the City of Vaughan](#)).
- » **A sustainability metrics score** at the pre-application consultation meeting, identifying that any mandatory targets have been satisfied.
- » **Technical background reports** (in conformance with a complete application package) including draft sustainability checklist.

- » ***Reviews and comments from the municipality and other agencies*** review reports, plans, sustainability checklist and/or sustainability report.
- » ***A sustainability checklist*** that will identify the performance target achieved for each metric and where the data supporting a metric's quantification is located in the reports/plans (e.g. Metric 23 is quantified under Section X of the transportation report).

7.5 | STEP 3: INTERNAL AND EXTERNAL CONSULTATION PLAN

Engagement, training, and education are essential to the successful development and implementation of a GDS. In this stage, interdepartmental training sessions should be held to test the feasibility of metrics with staff who are involved with reviewing development applications. Engagement sessions with external stakeholders and NGOs, including developers, builders, and local BILD association, should also be done in order to seek feedback and secure early support.

It is essential that these stakeholders are engaged early so that their questions can be answered and that there is ample time for them to become familiar with any new requirements and processes.

After consultation, the feedback received from stakeholders should be incorporated into a revised version of your GDS. This final draft will likely need to be submitted to council for comments. It is good practice to also share the final GDS draft with the public for comments and feedback.

Lastly, it is critical to secure a council “champion” for the project early on in the process. Their support will help to drive momentum and ensure the process is integrated into “business as usual” processes in the municipality.

7.5.1 and **7.5.2** are sample plans of an engagement strategy that involves both internal and external stakeholders and relevant parties.

ENERGY MODELLING

[One of the outcomes of a GDS is to reduce energy use and GHG emissions from buildings by advancing the transition to higher performing buildings. However, in order to evaluate the complex technical and design elements of these buildings, some form of energy modelling is often required to understand how a building is being designed to perform. To ensure consistency and equity in complying with codes and standards, **some jurisdictions have developed energy modelling guidance packages to assist applicants in complying with requirements.**

In the City of Toronto, the Planning Division has been requiring design stage energy modelling reports as proof of compliance with the Toronto Green Standard energy performance requirements since 2010. This requirement has significantly boosted the energy modelling industry in Toronto and has ensured that energy efficiency in building design is considered early on in the building and site design process. The City of Toronto's Energy Modelling Guidelines provide standardized inputs and software requirements for compliance with the TGS. These reports are reviewed by the City's Energy Efficiency Office, who also integrate any utility-based incentive programs available to cover energy modelling costs or to pay for construction savings.

In order to evaluate these reports, a municipality must have the capacity to review energy reports. Tools to help with this process have been developed, and how to make them available to municipal planning staff is under consideration. For example, a team lead by RWDI consultants created the COMPASS tool, with the purpose of making energy data available to non-experts. The Energy COMPASS design tool streamlines energy benchmarking and reporting during the design phase of building development projects. Modellers are able to upload energy models to the tool, which then automatically extracts over 400 variables and completes the submission requirements for six building standards and programs in a matter of seconds. A data visualization platform allows users to benchmark their modelled building against a database, which in turn, informs the design process — pushing buildings to ever-higher levels of performance.

In the past, the information contained in energy simulation files has not been leveraged to analyze performance trends or benchmark similar building types to improve performance. COMPASS is designed to enhance the quality of modelled energy performance, improve the energy literacy of the design and construction community, improve conservation program delivery, and ultimately reduce energy use and greenhouse gas emissions from every proposed building development in Ontario.

]

7.5.1 | INTERNAL ENGAGEMENT PLAN

MUNICIPAL STAFF WORKSHOP #1

Meeting Format: Full-day workshop, facilitated by staff or a consultant.

Purpose: The purpose of the workshop is to provide the municipality with an opportunity to introduce their project to internal staff and seek their feedback. It should be used as a testing exercise to check that the proposed metrics could be practically applied to typical planning application types at various scales of development. Staff will be divided into breakout groups and assigned a test site to be used to test the metrics.

TARGET AUDIENCE	WORKSHOP AGENDA	POST-WORKSHOP 1 ACTION ITEMS
<p>Municipal staff from multiple departments should be invited, such as:</p> <ul style="list-style-type: none"> » Planning » Engineering » Stormwater Management » Transportation » Infrastructure » Natural Environment » Parks and Urban Forestry » Solid Waste/Public Works » Urban/Community Design » Cultural Heritage 	<p>1. Presentation: General project introduction and description of key deliverables.</p> <p>2. Breakout groups: Each breakout group will be assigned a test site. Each group will have 1-2 hours to do the following:</p> <ul style="list-style-type: none"> » Demonstrate how the metrics may be applied to the selected test site. » Assess whether the proposed metrics: <ul style="list-style-type: none"> ↳ Were understandable, measurable and quantifiable. ↳ Applied to the test site in question. ↳ Had clear, consistent language/terms. » Review the accompanying tools for the metrics (checklist, guidebook, manual etc.). » Provide technical feedback on implementation, the draft metrics, and any targets or compliance thresholds. 	<p>1. Consolidate and review feedback gathered from the workshop.</p> <p>2. Identify metrics that require more discussion or additional technical input.</p> <p>3. Create a revision log for the metrics in order to track the evolution of the targets and metrics, to be updated through the course of the project based on feedback received.</p>

MUNICIPAL STAFF WORKSHOP #2

Meeting format: Full day workshop facilitated by staff or consultant.

Purpose: The intent of this workshop is to update municipal staff on the progress of finalizing a list of sustainability metrics, highlight the feedback received from external engagement with the development community, and gather specific feedback on: Implementation strategies/considerations, Metric point allocation; and dynamic tool functionality.

TARGET AUDIENCE	WORKSHOP AGENDA
<p>Municipal staff from multiple departments should be invited, such as:</p> <ul style="list-style-type: none"> » Planning » Engineering » Stormwater Management » Transportation » Infrastructure » Natural Environment » Parks and Urban Forestry » Solid Waste/Public Works » Urban/Community Design » Cultural Heritage 	<p>1. Presentation: Project updates, including a summary of feedback received from the previous workshop and workplan updates.</p> <p>2. Breakout Groups to seek feedback on:</p> <ul style="list-style-type: none"> » What changes are necessary to processes and/or documents for a phased implementation approach. » Refinement of the targets of the Sustainability Performance Metrics. » Refinement of the numerical scores associated with the Minimum Recommended and Aspirational targets. » Amending and/or creating supplementary documents. » Assessing the need for third-party certification of submittal materials and/or inspections. » Assessing new information that will be required for development applications.

7.5.2 | EXTERNAL ENGAGEMENT PLAN

The following are sample agendas for engagement sessions with external parties, such as developers and the public.

SAMPLE DEVELOPER ENGAGEMENT SESSION AGENDA

Purpose: To introduce the project objectives to the development community, including consultants.

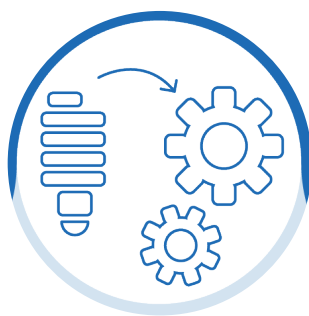
OBJECTIVES	TARGET AUDIENCE
1. Identify current regulatory, policy and industry barriers for sustainable development. 2. Introduce the project. 3. Introduce the structure of the sustainability metrics. 4. Identify high priority indicators/metrics. 5. Explore and seek feedback on possible incentive mechanisms.	» Developers » Industry associations » Consultant firms working in the municipality

PUBLIC CONSULTATION

Purpose: To share the project objectives with the public, its benefits for the community, and how GDS can help further municipal priorities.

OBJECTIVES	TARGET AUDIENCE	METHOD
1. Introduce the project. 2. Identify the goals of the GDS. 3. Seek public input on the GDS.	» Community Groups » Educational Institutions » Individuals	» Post documents on municipality's website for public comment. » Public Open House sessions. » Information Tables at large community events and community centres. » Include updates in councillor newsletters.

8.0 | MILESTONE 3: IMPLEMENTATION



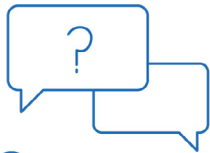
- » Once the GDS have been finalized, the municipality is ready for implementation. In this stage, the internal processes must be updated in order to integrate the GDS into the planning approvals.
- » This is also the stage where the new GDS requirements should be communicated to all stakeholders. Finally, staff and applicants should be trained on their use.
- » Communicating the use of the GDS to applicants early in their application process increases the likelihood that they are integrated into design plans from the beginning of the process.

THERE ARE THREE KEY STEPS IN MILESTONE 3:

1) *Update and review internal planning application review processes.*

2) *Communicate Green Development Standards project to stakeholders.*

3) *Train staff and applicants.*



1 Inquiry

8.1 | STEP 1: UPDATE AND REVIEW INTERNAL PLANNING APPLICATION REVIEW PROCESSES



2 Pre-Submission

All staff from various municipal departments that have a role in the planning approvals process need to understand how the GDS will be integrated into the development application approval process.



3 Formal Submission

Update the internal processes and policies for receiving and reviewing development applications to include the GDS and the new associated requirements, including the departments responsible for reviewing each submission requirement.

If applicable, amend the municipality's official plan to include language on the new green development standards and their connection to the municipality's priorities.



4 Technical Team Review

Update all public-facing development application documents and forms to reflect the new requirements, including the website and brochures.

The following framework provides a high-level overview of the process a municipality takes to review development applications with a GDS incorporated into the process.



5 Draft Approval



6 Detailed Design



7 Registration



8 Building Permit



9 Assumption



1. INQUIRY:

Applicant:

- » Inquires through counter, phone, website, etc.

Staff:

- » Directs inquirer to metrics resources and webpage/brochure.



2. PRE-SUBMISSION MEETING/CONSULTATION:

Applicant:

- » Uses the sustainability scoring tool manual to: understand the metrics, point allocation, overall scores and how to use and fill out the scoring tool.
- » Uses the sustainability scoring tool to determine their application's sustainability score with metrics applicable to the proposed development.
- » Submits initial sustainability score.

Staff:

- » Ensure that the applicant is aware of how each metric is verified.
- » Predesign meeting with Town staff and project design team.



3. FORMAL SUBMISSION:

Applicant:

- » Submit all GDS required documents and supporting materials virtually and hardcopies as specified by municipality.
- » Submits a written summary of sustainability metrics and other component studies.

Staff:

- » Determines if the application is complete or incomplete.



4. TECHNICAL TEAM REVIEW:

Applicant:

- » Re-submits if necessary.

Staff:

- » Interdepartmental review: building staff, planning staff, etc.
- » Documents areas of improvement for applicant.
- » Development planner completes an information report that includes the initial sustainability score.
- » Development planner circulates submitted written summary and component studies for review.
- » Technical Team verifies sustainability score using a checklist.
- » Technical Team advises of additional metrics that could be achieved in their comments to the planner (Project manager) who will provide these comments to the applicant.





5. DRAFT APPROVAL:

Applicant and Staff meet.

Applicant:

- » Submits a final written summary and other component studies.
- » Submits all final documents.

Staff:

- » Reports final sustainability score.
- » Provides approval with condition that detailed plans to follow the intent of the sustainability documents.
- » Draft Plan condition to provide a scoring range that the applicant must be within.



6. DETAILED DESIGN:

Applicant:

- » Address GDS comments and other comments.
- » Update submission.
- » Completes detailed design.
- » Resubmit along with updated tool.

Staff:

- » Reviews detailed design and verifies metrics.
- » Technical team reviews reports that were submitted earlier and verifies via study.
- » Landscape and engineering detailed designs.



7. REGISTRATION:

Applicant:

- » Building Stage.
- » Transfer from developer to builder.

Staff:

- » Secure all commitments.



8. BUILDING PERMIT:

Applicant:

- » Receives permit.

Staff:

- » Additional verification.
- » Issues permit.
- » Building staff or third party verifiers or additional staff resources verify that any energy and water conservation commitments are achieved.



9. ASSUMPTION:

Applicant:

- » Development complete.

Staff:

- » Municipality takes over public infrastructure built by developer.
- » Additional verification.

ROLE AND RESPONSIBILITY FRAMEWORK

PARTY	RESPONSIBILITY/ROLE
CITY COUNCIL	<ul style="list-style-type: none"> » Endorse GDS. » Approve Official Plan amendments to add or update policies to include purpose and implementation of GDS. » Approve or deny development applications, where GDS and sustainability objectives may be a factor in this decision.
PLANNING/ENVIRONMENT/ SUSTAINABILITY STAFF	<ul style="list-style-type: none"> » Seek council endorsement on GDS. » Develop GDS. » Explore partnerships with other municipalities and means of funding. » Engage internal and external stakeholders for feedback. » Develop guidance documents and tools for applicants. » Track and monitor uptake of GDS.
ENGINEERING, PARKS, URBAN DESIGN STAFF	<ul style="list-style-type: none"> » Verify metrics are satisfied by submission requirements. » Report back to Development Planner. » Provide clearance to Development Planner prior to Registration. » Confirm compliance (site visits, assumption, etc.) prior to assumption.
DEVELOPMENT PLANNING STAFF	<ul style="list-style-type: none"> » Inform Applicant at Pre-Application Stage of Submission Requirements. » Circulate to Design Team. » Report to Council – Information Report and Recommendation Report. » Insert Draft Plan/Site Plan condition to achieve Sustainability Score.

8.2 | STEP 2: COMMUNICATE GREEN DEVELOPMENT STANDARDS PROJECT TO STAKEHOLDERS

Developing communications products before the launch of the implementation of the sustainability metrics will help to communicate the key details of the project to stakeholders.

PUBLIC-FACING GENERAL COMMUNICATIONS:

Purpose: To report on the completion of the project and why the municipality is incorporating a GDS into the development review process. Ensure that communications products use common language to articulate the purpose of the GDS and how it demonstrates alignment with other municipal policies.

Channels: Post updates to appropriate municipal webpages and social media accounts, create flyers to leave at municipal permit office, and create content for Council newsletters.

Products:

- » Notices and updates to webpage content
- » Social Media posts
- » Council newsletters
- » Flyers

INTERNAL COMMUNICATIONS:

Purpose: To update staff on the status of the project and changes to internal processes. Channels: Staff involved in the development review process should receive an update and link to an internal online project web site (if applicable) where the final deliverables of the project will be posted.

Products:

- E-mail bulletin to staff/managers

EXTERNAL COMMUNICATIONS:

Purpose: To keep applicants informed of project updates, timelines, stakeholder engagement sessions, resources, and examples of success stories.

Channels:

- » E-mail
- » E-bulletin
- » Social media

Audience:

- » Development Industry
- » Industry Associations

Products:

- » Applicant resources: GDS Metrics tables or checklists, any scoring tools (Excel or web-based), and GDS guidebooks/manuals.

- » Newsletters showcasing success stories: Once several projects have been completed using the GDS, applicants should receive ongoing updates with examples of success stories and exemplary projects. Success stories will include:

- ℒ Highlights and/or innovative aspects of the development directly related to the Sustainability Performance Metrics.
- ℒ Sustainability aspects pursued, but not implemented because of City regulations and/or standards.
- ℒ Sustainability aspects implemented, but not recognized in the Sustainability Performance Metrics; and Sustainability options identified by staff to improve the sustainability score based on site conditions.

EXAMPLE COMMUNICATIONS BROCHURE FOR DEVELOPERS

Sustainability Score

The sustainability metrics are broken down into four categories. They represent major elements of sustainable community development. The performance indicators are designed to plan the required standards within the four categories.

Sustainability Metrics Category	Performance Indicators
Built Environment	<ul style="list-style-type: none"> compact development land use mix and diversity green buildings site accessibility housing unit mix landscape and street tree planting/preservation natural green space parking indoor air quality pedestrian connections cultural heritage resources economy community form
Mobility	<ul style="list-style-type: none"> street network/block site permeability transit supportive active transportation walkability
Natural Environment and Open Space	<ul style="list-style-type: none"> parks stormwater urban agriculture natural heritage system soils and topography urban forest
Infrastructure and Buildings	<ul style="list-style-type: none"> energy conservation potable water lighting bird friendly design materials and solid waste management heat island



Solar panels help power Elvis Stojko Arena

The Sustainability Metrics were created through a review and synthesis of existing sustainability standards such as LEED for Neighbourhood Development and the Toronto Green Development Standard. Input from other municipal sustainability guidelines and standards and stakeholders were also incorporated.

Partially funded through support from the Federation of Canadian Municipalities' Green Municipal Fund and the Places to Grow Implementation Fund, the project established Sustainability Metrics as one set of planning tools to achieve healthy, complete sustainable communities in each of the three municipalities.

Richmond Hill won a 2014 Excellence in Planning Award from the Ontario Professional Planners Institute (OPPI) in the category of Research/New Directions for the Sustainability Metrics.

For more information:

planning@richmondhill.ca

905-771-8910

Richmondhill.ca/SustainabilityMetrics

To obtain information about the Town of Richmond Hill in your preferred language, please call Access Richmond Hill at 905-771-8800.

This document is available in alternate formats upon request. Please contact Planning at 905-771-8910 for more information.



Produced by Communication Services, Office of the CAO, with information provided by Planning & Regulatory Services; last updated November 2014.

SUSTAINABILITY METRICS

Measuring the Sustainability Performance of New Development



The Yonge Street development in Richmond Hill illustrated above incorporates sustainability enhancements such as a green roof, landscaped parking lot, rainwater reuse system, ground-level retail and energy-efficient buildings.

Richmond Hill

Sustainability

Richmond Hill is committed to sustainable development as an important part of maintaining a vibrant community. Focusing on sustainable development will help Richmond Hill become a New Kind of Urban community.

In collaboration with the City of Brampton and the City of Vaughan, Richmond Hill has developed a set of metrics, including more than 50 targets, to quantify the sustainability of new development projects. The metrics provide consistent requirements across the three municipalities and will help applicants and Richmond Hill work together toward more sustainable development.

Examples of improved sustainability performance include projects that:

- Produce their own energy or support efficient use of energy
- Conserve water by implementing rainwater or greywater collection or similar initiatives
- Use environment-friendly materials in construction
- Use carbon-neutral products and processes to address climate change
- Reduce greenhouse gas emissions by encouraging use of sustainable transportation like public transit.



Bioswales capture and naturally filter rainwater

Implementation Tool

Visit RichmondHill.ca/SustainabilityMetrics for the Implementation Tool, Glossary and Guidebook and Instructions. Completion of the Implementation Tool, meeting the minimum sustainability score (approved by Council) and the summary letter are required as part of the development application process for the Town of Richmond Hill for Site Plan and Draft Plan applications.

Applicants collect points by proposing to provide any of the Recommended Minimum or Aspirational Metrics as part of their Site or Draft Plan application.

Sustainability Score

The following chart shows the levels of performance that can be achieved and the corresponding scores. Applications for Draft Plan and Site Plan must achieve at least a "good" score.

Performance Achieved	Applicant Score
Good	Draft Plan: 21-35 Points Site Plan: 32-45 Points
Very good	Draft Plan: 36-55 Points Site Plan: 46-65 Points
Excellent	Draft Plan: +56 Points Site Plan: +66 Points



Green roof at the LEED-certified Oak Ridges Community Centre



Stormwater management with quality and quantity controls at Pioneer Pond



Fire Station 8-6 is LEED-certified



Ground-level retail provides easy access to amenities and requires less travel



Bicycle lockers promote sustainable transportation

Sustainability Metrics: Review Process

Inquiry	Pre-submission	Submission	Circulation/Comment	Information Report	Recommendation report
Staff Directs applicant to metrics checklist via counter, phone or email.	Development application reviewed by committee and applicant directed to Implementation Tool.	Application, including Implementation Tool result and summary letter, is submitted.	Completed application is reviewed. Additional metrics are advised by staff.	Public meeting held seeking comments from Council. Additional metrics are advised by staff.	Report prepared with final sustainability score, seeking Council decision.

8.3 | STEP 3: TRAIN STAFF AND APPLICANTS

Train internal staff across departments on the updated process for reviewing proposals:

- » Plan to conduct internal training as early as possible and reoccur regularly afterwards.
- » Ensure planning staff are familiar with the rationale, purpose, and value of the GDS and are well-positioned to communicate the benefits of the new requirements to the development community.
- » Hold multiple training sessions for all departments and staff involved in reviewing development applications to ensure their familiarity with the GDS.
- » Plan to hold regular internal training sessions to address staff turnover and ensure continuity.

Train external applicants:

- » Create manuals and user guides to assist development applicants.
- » Create metric rationale documents, which are highly valued by developers.
- » Provide support for different types of applicants. Smaller developers may have different needs and questions than larger developers, and may require more support.
- » Ensure that your municipality offers reoccurring external training and workshops.

9.0 | MILESTONE 4: TRACK, MONITOR, AND REVIEW



- » In the final milestone, the municipality has developed and implemented the GDS. It should now develop a continuous process to track and monitor the uptake of the various sustainability metrics.
- » Ongoing action items for implementation and continuous monitoring can include:
 - ↳ Including the GDS score achieved in any recommendation reports to Council for each individual applicable development proposal.
 - ↳ Refining the GDS as needed to address legislative and provincial policy changes.
 - ↳ Developing additional educational and training resources.
 - ↳ Providing additional guidance, support, and training to City staff and external stakeholders.

» **Tracking and monitoring the uptake of metrics can help a municipality identify which actions are having the most uptake and which are not.** This can potentially be done with a web form that tracks uptake automatically, if your municipality has such a capacity. Based on this information, it may want to adjust its metrics to encourage more uptake and better environmental performance. This can be done by:

- ℒ Increasing any applicable compliance thresholds to require higher performing developments.

- ℒ Adjusting point allocations to reflect: environmental benefits, the relative difficulty of implementing the metric, and any updated standards and requirements.

- ℒ Amending which metrics are mandatory and which are voluntary.

» The municipality should also monitor feedback it receives on its tools, forms, and supporting resources in order to ensure continuous improvement. This can be done formally by establishing a specific way for the applicants to provide comments and input. Feedback should also be received on the communications products, to ensure they are meeting the needs of the user.

» Feedback and data can be used to measure the municipality's success in policy planning, and can be used to update policies as necessary. GDS presents a wealth of data that can be useful for many purposes.

10.0 | BEST PRACTICES AND LESSONS LEARNED



-
- » The following is a list of best practices for the process of developing and implementing GDS that has been compiled from municipal staff who have successfully worked through this process.
 - » ***Articulate a vision for sustainability early in the process***
 - ℒ Engage early and often to build support from stakeholders.
 - » ***Find your Champions/Success Stories***
 - ℒ Involve a diverse array of staff early in the process.
 - ℒ Clearly articulate internal and external roles.
 - ℒ Involve the Development Industry early, understand their interests.
 - ℒ Build external momentum by involving other external agencies (Region, CAs, non-profits).
-

» ***Build on an Existing Process and Enshrine in Official Plan***

- ℒ Weave Sustainability Metrics into an existing planning process.
- ℒ Do not overwhelm staff, implement practices slowly.

» ***Building of Metrics through internal workshops***

- ℒ Involve Design Team throughout the process.
- ℒ Understand your current practices, including what needs to be improved.
- ℒ Ensure continuous training and re-training to address turnover.

» ***Set Quantifiable, Measurable Metrics***

- ℒ Ensure your “Menu” of Sustainability Metrics are things a municipality can reasonably obtain using Planning Act tools.

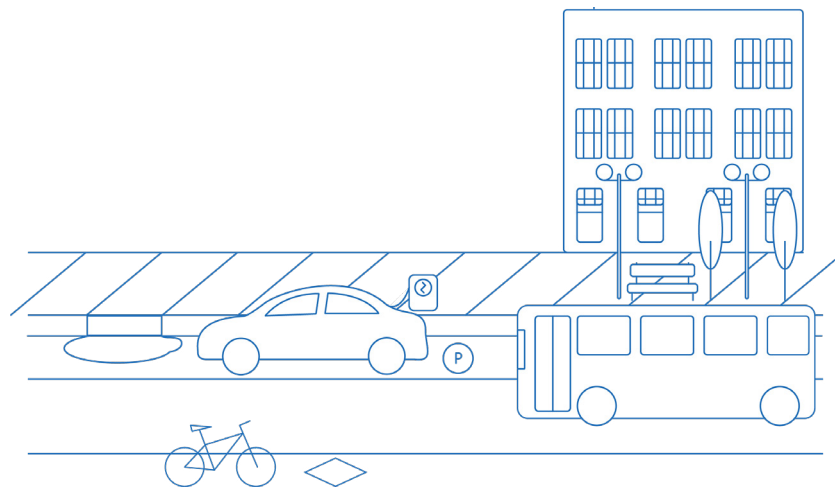
» ***Allow for Flexibility***

- ℒ Establish a Rating System (“Threshold Scores”) to clarify the amount of Metrics you’re seeking uptake on.

» ***Test Real Applications with the Development Industry***

- ℒ Build trust and credibility for the System.
 - ℒ Give people a reason to become comfortable with the System.
-

11.0 | INCENTIVES AND MARKETING



-
- » Municipalities may want to consider the use of incentives to encourage the uptake of metrics in their GDS. This section will outline a variety of tools available to municipalities to help incentivize the development of high performing buildings and communities through their GDS.
-

11.1 | DEVELOPMENT CHARGE REBATES

Development Charges (DC's) are fees collected from developers and builders at the time a building permit is issued to pay for municipal infrastructure and services. The Development Charges Act allows municipalities to implement a program of development charge reductions, exemptions, or grants to provide a financial incentive to encourage developers and builders to comply with their GDS. This allows upper and lower tier municipalities to offer partial or total exemption from municipal development charges via their Development Charge (DC) by-laws.

For example, rebates are commonly used to attract industry and jobs, or to incent brownfield development (i.e. since the cost to provide all infrastructure renewal around brownfields is commonly far less than for new developments, most already being in place from prior usages of the site). In theory, development that is built to certain sustainable standards, such as net-zero energy developments, should provide less strain on municipal infrastructure than traditional buildings. If this is the case, fees

that are tied to infrastructure use, like DCs, could also be reduced.

In order to be cost-neutral, the municipality would need to ensure that the DC rebate is comparable to savings on municipal infrastructure costs, such as a reduction in sewer use and waste generation (as opposed to savings on energy grid costs, which should be reflected in utility incentives and not in municipal ones). However, if savings to the municipality on municipal infrastructure are not realized, this incentive would not be considered a recoverable cost, and would represent an investment funded by the tax base.

CONSIDERATIONS FOR IMPLEMENTING DEVELOPMENT CHARGE REBATES:

Financial: The financial implications of this approach may be significant, depending on the municipality. For a lower-tier municipality, a larger portion of the DCs may flow through the upper-tier municipality. In order for a reduction in the municipal portion of the DCs to make a noticeable difference to the applicant, they would need to be substantial.

By reducing development charges, the Municipality eliminates a stable revenue stream and risks not generating sufficient revenue to meet growth related capital costs (which may require a property tax increase or similar to compensate). As well, depending on the amount of uptake, and staff resources currently responsible for reviewing and processing applications, additional staff may be required.

Timing: A municipality would need to pass or amend a Development Charge By-law, integrating any charge reductions or exemptions for green development.

Staff Resources: Some municipalities may currently offer DC incentives for a variety of development types. Depending on the uptake for new residential developments, it may be possible to review and process applications as part of the existing workflow. Alternatively, if uptake is high, additional staff resources may be required to administer these applications.

11.2 | COMMUNITY IMPROVEMENT PLANS

A Community Improvement Plan (CIP) is a tool under Section 28 of the Planning Act that allows a municipality to direct funds and implement policy initiatives toward a specifically designed project area, provided it has enabling policies in its Official Plan. The definition of 'community improvement' within the Planning Act includes 'planning or replanning, design or redesign, resubdivision ... development or redevelopment, construction, reconstruction and rehabilitation, [and] improvement of energy efficiency.' Since CIPs allow a municipality to offer loans and grants for these activities, those grants or loans could be offered to developers who follow a GDS to build green infrastructure.

Municipalities may create additional Community Improvement Plans to allow for the use of loans and grants, such as DC rebates and tax grants. Community Improvement Plans (CIPs) stimulate targeted reinvestment, encourage select infill and intensification opportunities, coordinate planning efforts, preserve neighbourhood and heritage character, enhance industrial and business opportunities, and

provide incentives for the remediation of contaminated sites. If this incentive is to apply to new residential development, consideration should be given to creating CIPs within the yet to be developed areas, both within the existing built up area and designated greenfield areas.

CONSIDERATIONS FOR IMPLEMENTING COMMUNITY IMPROVEMENT PLANS:

Financial Implications — Low:

Under the Planning Act, grants and loans under a CIP can cover all, or part of, environmental site assessment, environmental remediation, development, redevelopment, construction and reconstruction of lands and buildings for rehabilitation purposes, and the provision of energy efficient uses, buildings, structures, works and improvements or facilities. Typically, in relation to green development, grants and loans provided have been relatively small, and used to encourage small-scale property improvements that result in more efficient and sustainable dwellings (i.e. solar panels, window replacement, low-flow fixtures, and energy efficient appliances). The municipality can determine an appropriate financial cap on grants and loans for such a program, and limit the amount invested in these measures, depending on its priorities. Thus, the financial

impact on the municipality is dependent upon the program design and available financing, and the anticipated benefits of the resulting green development.

Timing of Implementation — Mid-Long:

In order to direct grants to new CIP areas, such as future residential neighbourhoods, a municipality would need to complete several steps. It would need to establish additional CIP areas through designation in the Official Plan with the approval of Council, develop the CIP, and complete the necessary consultation. Some municipalities may choose to do one single Official Plan update to designate the entire Municipality as a CIP.

Staff Resources — Med:

Municipal staff from several departments would be required to be involved in the initial design of the program. This could include planning, legal, finance, among others, in determining the parameters for the program, including the amount of funds available, and the different types of grants and loans to be offered. Once the program is established, additional staff resources may be required to review and administer grants and loans related to the CIP program depending on the level of uptake.

11.3 | EXPEDITED APPROVAL PROCESS

Some municipalities have considered implementing an expedited development approval process for exemplary sustainability projects that follow their GDS. Developers have expressed that they would favour this strategy, as it would streamline their work.

There are a few approaches a municipality might take to more efficiently manage the approvals process in order to streamline it. Firstly, a municipality should establish specified timeframes for informing applicants of whether their applications are complete, and for issuing approvals or providing reasons for a refusal to encourage better performance. This should be communicated to applicants prior to submitting their applications¹. Second, the municipality should clearly communicate to applicants the elements required for a complete application for each type of permit. This could be done on a public forum, such as their website.

Having this information readily available and accessible would ensure that there are a fewer delays as a result of incomplete submissions. Of course, pre-application meetings would still be required for major permits such as complex building projects (e.g. a hospital or large subdivision development), where an inter-departmental team of municipal staff meet with the applicant.

In Ontario municipalities, average timelines for processing development applications can vary substantially. Some exceed the provincially legislated timelines prescribed in the Planning Act, and others are regularly able to meet those timelines.

In Ontario, the Planning Act establishes timelines for various planning applications within which municipalities are expected to make decisions. After those timelines have passed, if a decision has not been made, the applicant is entitled to appeal the matter to the Local Planning Appeal Tribunal.

¹ Modernizing Building Approvals in Ontario: Catching Up with Advanced Jurisdictions
by Lynn Duong and David Amborski, Centre for Urban Research and Land Development at Ryerson University

The timeframes established in the Planning Act provide a general indicator of processing times that are deemed to be reasonable and provide a benchmark for evaluating which decisions should be made.

The Ontario Building Code also establishes timelines for processing Building permit applications.

While it may not be feasible for individual municipalities to expedite their approval processes, this could be achieved if provincial planning staff provided support to municipalities with limited capacity to review applications more quickly.

CONSIDERATIONS FOR IMPLEMENTING AN EXPEDITED APPROVAL PROCESS:

Financial — Low:

There are no expected financial impacts of this approach.

Timing of Implementation — Med/Long:

Implementing an expedited approvals process may take a long time to implement, depending on the municipality's current processes and staff resources. It may take time to train staff on reviewing GDS.

Staff Resources:

This may likely require additional staff.

Feasibility:

This may not be feasible in many municipalities. In Ontario, mandatory timelines for development applications have already been reduced.

11.4 | TAX INCREMENT BASED GRANTS (TIBG)

A Tax Increment Based Grant is a financing tool for municipal brownfield development that permits the deferral of taxes on an incremental scale to encourage the remediation of sites with various issues and significant financial outlay before new development can occur.

Tax Assistance Plans (TAPs) and Tax Increment Grants (TIGs) are two terms used to describe the same concept. When a property is developed or improved, the taxable revenues to the City for that site will increase, and the City can waive all or part of that uplift in advance to motivate certain choices on the part of the developer. The "incentive" in this case is a partial or complete waiver of the municipal property tax applicable to the site, for a fixed period of time.

Eligibility for the waiver can be made specific to certain scope commitments which the municipality desires of the developer (e.g. committing to energy improvements, to connect to a district energy system, etc.). This could conceivably also be used for compliance with elements of a GDS, which often includes similar commitments. TAPs/TIGs often have no net cost impact on the municipality, because the site being incented will typically have been generating little or no tax revenue prior to development, and any revenue from the site afterward is positive. Waiving the increase in expected levies means that the municipality will still be collecting tax income from the site, only at a lesser amount, and only until the incentive is “paid out” (i.e. until the cumulative amount of tax waived/not collected is equal to the amount of the incentive offered). Once the terms of the incentive offer are fulfilled, the tax assistance ends and the site reverts to being fully taxed as normal, based on the improved property value.

The primary difference between TAPs and TIGs is that TIGs apply only to the increase in levies expected after development has successfully been completed, not to any municipal taxes associated with the value of the land prior to development, whereas TAPs could apply to the entire municipal tax levy on the site.

11.5 | SERVICING ALLOCATION BASED ON COMPLIANCE

Some municipalities have taken a compliance based approach to encouraging sustainable development, by using servicing allocation as an incentive for applicants. Water and wastewater servicing needs increase along with municipal growth. The amount of servicing capacity, expressed in persons, is assigned to local municipalities, and in turn, local municipalities allocate capacity to developers to support residential growth.

If there is a limited amount of servicing capacity, applicants will place a premium value on any available allocation, and want to be given potential allocation.

Thus, allocation can be considered as an incentive to encourage applicants to design and produce high-performing buildings and contribute to sustainable communities.

Several municipalities have taken this approach. For example, in Ontario, the City of Richmond Hill has created a servicing allocation policy that allocates municipal servicing to developments that are consistent with achieving a “good” score on the city’s Sustainability Metrics. Vaughan has received direction from York Region to tie servicing allocation to its sustainability metrics, as servicing is set aside by the region for more sustainable development. The Town of Halton Hills looks for applications to satisfy their Green Development Standards and uses this as a basis for assessing the compliance of the proposed development with the Official Plan and for assigning servicing capacity.

CONSIDERATIONS FOR IMPLEMENTING SERVICING ALLOCATION CROSS COMPLIANCE:

Financial Implications — Low:

No financial implications are anticipated with this incentive.

Timing of Implementation — Med/Long:

Some municipalities are responsible for determining servicing allocations and capacity, while others must work with their upper-tier municipality to negotiate servicing incentives.

Feasibility — Municipally-Dependent:

This tool is best suited to municipalities with limited servicing capacity, or restrictions on allocation. In municipalities where servicing is not limited, this tool would not work.

Staff/Material Resources — Low:

No additional staff/material resources are anticipated to implement this incentive at the Municipal level.

Legal Considerations — Med:

Servicing allocation cannot be appealed to the LPAT but the enabling policies in the Official Plan can be appealed to the LPAT.

11.6 | AWARDS AND RECOGNITION PROGRAM

Municipalities may take a marketable approach to their incentives if financial incentives are not feasible. Builders who achieve exemplary standards in residential and neighbourhood projects can be recognized through awards programs. Being the recipient of such an award can provide a substantial boost to the marketing efforts of the developer.

A municipality may create specific awards for Green Development, or, as a distinct category as part of a larger urban design awards process. Awards should be automatically presented to builders, so the incentive is not based on subjective voting, but rather performance.

CONSIDERATIONS FOR AN AWARDS OR RECOGNITION PROGRAM:

Financial Implications — Low:

Minimal financial implications are anticipated with this incentive.

Timing of Implementation — Short:

This can be implemented through creating an additional category during existing awards/recognition programs.

Staff/Material Resources — Low:

No additional staff/material resources are anticipated to implement this incentive at the municipal level.



Municipalities may choose to partner with other jurisdictions/regions for larger awards ceremony that gives more recognition for large developers that work across municipalities.

APPENDIX A:

GREEN DEVELOPMENT STANDARDS METRICS FOR LOW-RISE RESIDENTIAL DEVELOPMENT



APPENDIX A

These metrics are a suggested list of sustainability metrics to be included in a municipality's GDS. They might not all apply to your municipality. Rural municipalities may not be able to implement these metrics related to transportation, connectivity, and proximity to amenities. They may need to be modified to suit the municipality's rural character. For example, these metrics may be able to be applied to certain areas, neighbourhoods, or developments.

ENERGY EFFICIENCY

Note:

- » If possible, your municipality should aim to focus on GHG emissions in this metric, rather than energy efficiency. See Tables 1 and 2 for an example of the Toronto Green Standard for TEUI, TEDI and GHG intensity. Please note that these numbers apply to mid to high-rise residential and non-residential development in Toronto.

METRIC	Energy Efficiency
APPLIES TO	Site Plan and Draft Plan
TIER 1	Design buildings to achieve at least ENERGY STAR for New Homes, version 17.1 or R-2000 requirements.
TIER 2	<ul style="list-style-type: none">» Design buildings to achieve at least ENERGY STAR for New Homes, version 17.1 or R-2000 requirements.» Where supplied, for each unit, provide ENERGY STAR® labeled refrigerators, ceiling fans, clothes washers and dishwashers.
TIER 3	Design and construct the building to be Net Zero ready in accordance with the CHBA Net Zero Home Labelling Program.
TIER 4	Design and construct the building in accordance with the CHBA Net Zero Home Labelling Program, Passive House Standards, or Living Building standards.

HOW IT IS DEMONSTRATED	<ul style="list-style-type: none"> » Provide a letter of intent signed by a professional. » Commit by signing a Site Plan Agreement / Letter of Undertaking including conditions to follow through. » Request builders fill out draft EEDs forms so site plan intentions can be compared directly to permit applications. » For buildings greater than 2000 m², submit an Energy Modeling Report.
WHO IS RESPONSIBLE FOR REVIEWING	Planning Staff
RATIONALE	Reduce energy use and greenhouse gas emissions with consequent reductions in air, water, and land pollution and adverse environmental effects from energy production and consumption. Lessen environmental impacts such as climate change.

**TABLE 1: TORONTO GREEN STANDARD VERSION 3
BUILDING ENERGY PERFORMANCE REQUIREMENTS TIER 1 AND 2**

BUILDING TYPE	TOTAL ENERGY USE INTENSITY (KWH/M ²)		THERMAL ENERGY DEMAND INTENSITY (KWH/M ²)		GREENHOUSE GAS INTENSITY (KG/M ²)	
	TIER 1	TIER 2	TIER 1	TIER 2	TIER 1	TIER 2
MULTI-UNIT RESIDENTIAL BUILDINGS (≥4 STOREYS)	170	135	70	50	20	15
MULTI-UNIT RESIDENTIAL BUILDINGS (≤ 6 STOREYS)	165	130	65	40	20	15
COMMERCIAL OFFICE BUILDINGS	175	130	70	30	20	15
COMMERCIAL RETAIL BUILDINGS	170	120	60	40	20	10
MIXED USE BUILDINGS (90% RESIDENTIAL, 5% RETAIL, 5% COMMERCIAL)	170	134	70	49	20	15
ALL OTHER BUILDING TYPES	» Tier 1: ≥15 per cent improvement above SB-10, 2017 » Tier 2: ≥25 per cent improvement above SB-10, 2017					

Note:

- » Follow the Energy Report Guideline for definitions and modelling guidelines for all targets including Tier 3 and 4 near zero emissions buildings targets.
- » For specific mixed-use buildings, specific targets can be derived using an area weighted average of the performance targets from the other building types.

**TABLE 2: TORONTO GREEN STANDARD VERSION 3 HIGH PERFORMANCE,
NEAR ZERO EMISSIONS REQUIREMENTS TIER 3 AND 4**

BUILDING TYPE	TOTAL ENERGY USE INTENSITY (KWH/M ²)		THERMAL ENERGY DEMAND INTENSITY (KWH/M ²)		GREENHOUSE GAS INTENSITY (KG/M ²)	
	TIER 3	TIER 4	TIER 3	TIER 4	TIER 3	TIER 4
MULTI-UNIT RESIDENTIAL BUILDINGS (≥4 STOREYS)	100	75	30	15	10	5
MULTI-UNIT RESIDENTIAL BUILDINGS (≤ 6 STOREYS)	100	70	25	15	10	5
COMMERCIAL OFFICE BUILDINGS	100	65	22	15	8	4
COMMERCIAL RETAIL BUILDINGS	90	70	25	15	5	3
MIXED USE BUILDINGS (90% RESIDENTIAL, 5% RETAIL, 5% COMMERCIAL)	100	74	29	15	10	5

Note:

- » Follow the Energy Report Guideline for definitions and modelling guidelines for all targets.
- » For specific mixed-use buildings, specific targets can be derived using an area weighted average of the performance targets from the other building types.
- » **Tier 3 or 4 GHG 1.3 High Performance, Low Carbon Pathway:** Design the buildings to meet or exceed the Tier 3 or Tier 4 targets by building type as provided in Table 2.
- » Alternative compliance options will be accepted for Tier 3 or Tier 4 TGS including the CaGBC Zero Carbon Building Standard or Passive House standard certification.

ENERGY MANAGEMENT

METRIC	Energy Management
APPLIES TO	Block, Draft and Site Plans
MANDATORY	<ul style="list-style-type: none"> » Develop an energy strategy for the development, identifying opportunities for conservation, energy sharing, renewables, with a focus on reducing the use of natural gas. » In an intensification area, where district energy has been deemed viable by the municipality, carry out a district energy feasibility study.
VOLUNTARY	For new buildings with a gross floor area of greater than 100 m ² , install renewable energy devices to supply at least 20% of the buildings total energy load from one or a combination of energy sources (with a focus on thermal energy to maximize carbon impacts).
HOW IT IS DEMONSTRATED	Design and construct the building to be Net Zero ready in accordance with the CHBA Net Zero Home Labelling Program.
TIER 4	Design and construct the building in accordance with the CHBA Net Zero Home Labelling Program, Passive House Standards, or Living Building standards.

<p>HOW IT IS DEMONSTRATED</p>	<p>Included in an Energy Report issued and signed by a professional.</p> <p>SUBMISSION REQUIREMENTS:</p> <ul style="list-style-type: none"> » Submit an Energy Report outlining the energy strategy for the development. The report should highlight: <ul style="list-style-type: none"> ↳ Energy conservation measures that will be adopted and the expected savings (energy, GHG emissions, operating cost, peak demand, etc.). ↳ Opportunities for renewable energy/energy sharing between buildings. <p>*IF APPLICABLE: In intensification areas, where district energy has been deemed viable by the municipality:</p> <ul style="list-style-type: none"> » Submit an Energy Report, outlining the viability of renewable district energy for the site, with a focus on renewable thermal networks over natural gas. The report should quantify and highlight: <ul style="list-style-type: none"> ↳ The projected annual energy consumption for the site, broken out by heating (space heating and hot water, cooling and electricity). ↳ The projected electricity demand for the site (average seasonally and peak demand). ↳ Identified technologies/equipment to be considered for energy supply. ↳ The relative savings (energy, GHG emissions, peak demand, operating cost) for each relevant technology. ↳ Final recommendations for district energy viability and technologies.
<p>WHO IS RESPONSIBLE FOR REVIEWING</p>	<p>Development Planning</p>
<p>RATIONALE</p>	<p>District energy systems can provide more efficient heating and cooling for residential and commercial customers (providing there is density of development). This aids governments in reaching reduction targets for greenhouse gas emissions while also benefitting customers in reduced ongoing energy expenses and reduced one-time first costs for mechanical equipment.</p>

PEDESTRIAN INFRASTRUCTURE

METRIC	Walkable Streets/ Pedestrian Infrastructure
APPLIES TO	Block, Draft and Site Plans
TIER 1	Follow municipal street design guidelines/ standards and incorporate accessibility and universal design.
TIER 2	Weather Protection — Provide covered outdoor waiting areas for pedestrian comfort and protection from inclement weather.
HOW IT IS DEMONSTRATED	<p>Included in the Site Plan Drawings and Transportation Study (Draft and Block Plans).</p> <p>SUBMISSION REQUIREMENTS:</p> <ul style="list-style-type: none"> » Verify and document that the sidewalks comply with Municipal Standards. » Quantify the total length of streets included in the project boundary. » Quantify the % street length where sidewalks are continuous and included on both sides of the street. » List pedestrian amenities (see glossary) that are included on the sidewalks.³) If applicable, identify the additional features that advance the objectives of the applicable pedestrian and cycling master plan and provide reference to relevant language in the master plan.
WHO IS RESPONSIBLE FOR REVIEWING	Planning/Transportation

PROXIMITY TO BASIC AMENITIES (VOLUNTARY)

METRIC	Proximity to Lifestyle/Basic Amenities
APPLIES TO	Draft, Block, Site Plans
VOLUNTARY METRIC	<p>50% of DU and jobs are within an 800m walking distance to existing or planned Basic Amenities.</p> <p>BASIC AMENITIES INCLUDE:</p> <ul style="list-style-type: none"> » Grocery store/farmers market, place to buy fresh produce » Community/Recreation Centre » Pharmacy » Library » General retail » Convenience store » Theatre » Coffee store » Hair salon » Bank » Place of worship » Daycare » Restaurant/Pub Other » School » Transit Stop
HOW IT IS DEMONSTRATED	Identify clusters/circles that capture 50% of the Dwelling Units (DU) and jobs within the proposed plan. Apply radial circles to the plan demonstrating if 50% of the planned development is within 800m walking distance to planned or existing amenities.
WHO IS RESPONSIBLE FOR REVIEWING	Development Planning
RATIONALE	<p>Recognize sites with good community connections to services and/or promote services to encourage compact communities and multi-modal transportation options.</p> <p>Recognizes a fine grain mix of uses as promoted in municipal official plans. The metric and targets are adapted from the point scoring system used in LEED ND.</p>

Note:

ⓘ In a municipality with mainly infill development and urban form, this may not be applicable. This metric

can be included as a voluntary option, and it may be feasible to make it mandatory in the future after significant development.

GREEN BUILDING (ALTERNATE PATHWAY TO ENERGY METRIC)

METRIC	Green Building
APPLIES TO	Draft
VOLUNTARY	<ul style="list-style-type: none"> » Site includes 1 or more green buildings certified under a recognized third party standard (i.e. Energy Star, LEED NC, CS, CI, EB, Homes). » Development plans include 5 or more buildings on site certified under a recognized third party standard (i.e. Energy Star, ASHRAE 189, LEED NC, CS, EB, Homes, etc.). <ul style="list-style-type: none"> » + points if 50% to 75% of buildings are certified. » + points if 76% to 100% of buildings are certified.
HOW IT IS DEMONSTRATED	<ul style="list-style-type: none"> » Commit to or demonstrate that at least 1 building within the project boundary will be certified to a recognized third party green rating system. » For sites that include 5 or more buildings, identify the percentage (%) of buildings that will be certified to a recognized third party green rating system. » Request proof of registration, and preliminary checklist or other document for the certification program.
WHO IS RESPONSIBLE FOR REVIEWING	Planning/Sustainability/Building Standards
RATIONALE	Recognize appropriate independent third-party certification systems incorporated into development proposals.

TREE CANOPY — WITHIN PROXIMITY TO BUILDING/PEDESTRIAN INFRASTRUCTURE

METRIC	Tree Canopy — within proximity to building/pedestrian infrastructure.
APPLIES TO	Site Plan
MANDATORY	<ul style="list-style-type: none"> » Provide shade within 10 years for at least 50% of the walkways/sidewalk lengths. All trees should be selected from the applicable municipal tree list. » PARKING LOTS: If surface parking is permitted and provided, plant large growing shade trees throughout the parking lot interior at a minimum ratio of one tree planted for every five (5) parking spaces supplied. » WATERING PROGRAM: Provide a watering program for trees for at least the first 2 years after planting.
VOLUNTARY	<ul style="list-style-type: none"> » Provide shade within 10 years for at least 75% of the walkways/sidewalk lengths. All trees should be selected from the applicable municipal list. » PARKING LOTS: If surface parking is permitted and provided, plant large growing shade trees throughout the parking lot interior at a minimum ratio of one tree planted for every three (3) parking spaces supplied. » WATERING PROGRAM: Provide a watering program for trees for at least the first 2 years after planting.

<p>HOW IT IS DEMONSTRATED</p>	<p>Included in Landscape Plan/Drawings.</p> <p>SUBMISSION REQUIREMENTS:</p> <ul style="list-style-type: none"> » Tree Lined Streets. <ul style="list-style-type: none"> ▮ Review Municipal Standards and confirm that the plan includes street trees planted on both sides of the street (in accordance with Municipal Standards). ▮ On a plan, identify the new and existing streets included in the plan. ▮ On a plan, identify the trees that are included along new and existing streets (between vehicle travel lane and walkways). ▮ Quantify the average interval spacing between trees (in meters) for all street trees included in the plan. Shaded Streets. <ul style="list-style-type: none"> ▮ See Document Compliance description.
<p>WHO IS RESPONSIBLE FOR REVIEWING</p>	<p>Urban Design/Environmental Planner</p>
<p>RATIONALE</p>	<p>As part of the urban forest, street trees provide a range of ecosystem services including: cleaning air; intercepting rainfall that helps to mediate storm flows; evaporative cooling and summer shade to reduce building cooling loads; wind breaks; and carbon sequestration. As community amenities, street trees promote active transportation by providing a more walkable pedestrian environment.</p>

TREE CANOPY — MAINTAINING EXISTING TREES

METRIC	Tree Canopy — Maintaining existing trees and Soil Fertility
APPLIES TO	Draft and Site Plans
MANDATORY	<ul style="list-style-type: none"> » Arborist Report provided that identifies and evaluates where on site healthy mature trees will be protected (in-situ or moved) or removed. » Where healthy mature trees must be removed, new trees (not including street trees) are provided on site or as determined by the municipality to mitigate the lost canopy coverage of the trees removed.
VOLUNTARY	75% of healthy mature trees greater than 20cm. DBH are preserved in situ on site.
HOW IT IS DEMONSTRATED	Arborist Report that clearly reports total number of trees removed, to be protected, and to be moved. Also include percentages of tree health.
WHO IS RESPONSIBLE FOR REVIEWING	Parks/Natural Heritage Planning
RATIONALE	As part of the urban forest, street trees provide a range of ecosystem services including: cleaning air; intercepting rainfall that helps to mediate storm flows; evaporative cooling and summer shade to reduce building cooling loads; wind breaks; and carbon sequestration. As community amenities, street trees promote active transportation by providing a more walkable pedestrian environment.

SOIL QUANTITY AND QUALITY

METRIC	Soil Quantity, Quality and Fertility
APPLIES TO	Draft and Site Plans
MANDATORY	<ul style="list-style-type: none"> » Pits, trenches or planting beds should have a topsoil layer with an organic matter content of 10 to 15 % by dry weight and a pH of 6.0 to 8.0. The topsoil layer should have a minimum depth of 60cm. The subsoil should have a total uncompacted soil depth of 90cm. Minimum soil volume of 30 cubic meters per tree. » Undertake a Topsoil Fertility Test for the entire site and implement its recommendations. » Avoid development on highly permeable soils following TRCA and CVC Low Impact Development Stormwater Management Planning and Design Guide (or other local LID SWMP guides).
VOLUNTARY	<ul style="list-style-type: none"> » Minimum 200mm of top soil is provided across the entire site (2 POINTS). » Minimum 30 cubic metres of soil per tree is provided (1 POINT). » Provide 25% more soil volume than the 30 cubic metres per tree (1 POINT).

<p>HOW IT IS DEMONSTRATED</p>	<ul style="list-style-type: none"> » Provide an arborist report that identifies and evaluates the healthy, mature trees that will be protected (in-situ or moved) or removed. » Where healthy, mature trees are removed, quantify the number of new trees required to mitigate the lost canopy. » NOTE 1: This metric (and associated points) are excluded if there are no healthy, mature trees within the project boundary. » NOTE 2: This metric applies for healthy, mature trees on the developable portion of the site (e.g. not in the protected natural heritage system). Compensation may be used to enhance the Municipal natural heritage system in accordance with the Municipal policies. » Soil Fertility test.
<p>WHO IS RESPONSIBLE FOR REVIEWING</p>	<p>Urban Design/Engineering</p>
<p>RATIONALE</p>	<p>Limit disturbance of healthy soil to: protect soil horizons and maintain soil structure; support biological communities (above-ground and below-ground); minimize runoff and maximize water holding capacity; improve biological decomposition of pollutants; and moderate peak stream flows and temperatures.</p>

CONNECTION TO NATURAL HERITAGE

METRIC	Connection to Natural Heritage
APPLIES TO	Block, Draft and Site Plans
MANDATORY	<ul style="list-style-type: none"> » Plant the landscaped area within the Natural Heritage System and the Ravine Protected Area with 100% native plants (including trees, shrubs and herbaceous plants). » EC 2.2 Ravine and Protected Areas Buffers. » Where a setback from the toe-of-slope or the top-of-bank is required within the Natural Heritage System or the Ravine Protected Area prepare and implement a stewardship plan for the area. » Visual and physical connections (such as public access blocks, single loaded roads) are provided to 25% of the natural heritage system and parks.
VOLUNTARY	Visual and physical connections (such as public access blocks, single loaded roads) are provided to 50% of the natural heritage system, with efforts to mitigate impact of the connections (i.e. Erosion control, invasive species management).

HOW IT IS DEMONSTRATED	<p>Included in Urban Design Submission and Landscape Plan.</p> <p>SUBMISSION REQUIREMENTS:</p> <ul style="list-style-type: none"> » Identify if a natural heritage system is included within the project boundary. If one or 400m Neighbourhood Radius 14 multiple systems are included, identify the natural heritage elements on the landscape plan. » Highlight strategies that have been used to enable a visual and/or physical connection to the natural heritage system. » Quantify the % connection for the natural heritage system.
WHO IS RESPONSIBLE FOR REVIEWING	<p>Environmental Planning/Engineering/Urban Design</p>
RATIONALE	<p>Improve natural heritage system function with respect to wildlife habitat and/or ecological functions, including ecosystem services</p>

PEDESTRIAN CONNECTIONS — TRAFFIC CALMING

METRIC	Pedestrian connections-traffic calming
APPLIES TO	Block, Draft and Site Plans
MANDATORY	100% of new residential-only streets designed with traffic calming strategies.
VOLUNTARY	75% of new non-residential and/or mixed-use streets are designed with traffic calming strategies.
HOW IT IS DEMONSTRATED	<p>Included in the Transportation Study or Traffic Impact Study.</p> <p>SUBMISSION REQUIREMENTS:</p> <ul style="list-style-type: none"> » Highlight the new residential-only and new non-residential/mixed use streets in the project (if any). » Identify the % of street length (broken out by resident only and non-resident) that include street calming techniques. » On a drawing, identify the traffic calming strategies that are included in the project.
WHO IS RESPONSIBLE FOR REVIEWING	Planning/Transportation Planning/Transportation Engineering
RATIONALE	Provide walkable streets to encourage active transportation.

SCHOOL PROXIMITY TO TRANSIT ROUTES & BIKEWAY

METRIC	School Proximity to Transit routes & Bikeway
APPLIES TO	Block, Draft and Site Plans
VOLUNTARY	<ul style="list-style-type: none"> » 50% of dwelling units are within 800 meters walking distance to public/private elementary, Montessori, and middle schools 50% of dwellings units are within 1600 meters to a high school. » 75% of dwelling units are within 400 meters walking distance to public/private elementary, Montessori, and middle schools. » 75% of dwellings units are within 1000 meters to a high school.
HOW IT IS DEMONSTRATED	<p>Included in the Planning Justification Report, Urban Design Submission or Transportation Study or Traffic Impact Study Submission requirements:</p> <ul style="list-style-type: none"> » On a project map, identify the: <ul style="list-style-type: none"> ▮ Existing or planned school(s) ▮ Existing or planned transit stops ▮ Existing or planned dedicated bike network » For all of the existing or planned schools, quantify the radial walking distance (in meters) to existing or planned transit stops and dedicated bike networks.
WHO IS RESPONSIBLE FOR REVIEWING	Planning/Urban Design
RATIONALE	Promote walking and cycling to schools and reduce traffic congestion at school sites.

CULTURAL HERITAGE CONSERVATION

METRIC	Cultural Heritage Conservation
APPLIES TO	Block, Draft and Site Plans
MANDATORY	<ul style="list-style-type: none"> » Comply with Cultural Heritage Conservation policies under provincial legislation (i.e. the Ontario Heritage Act, Planning Act and PPS, etc.), Standards and Guidelines for Historic Places, municipal Official Plan, municipal by-laws, Municipal Register of Cultural Heritage Resources and/or Municipal Heritage Inventory. » 100% evaluation of properties included in the Municipal Heritage Inventory and/or Register, and 100% retention and protection of cultural heritage resources that qualify for designation under the Ontario Heritage Act.
VOLUNTARY	100% conservation of cultural heritage resources identified in the Municipal Heritage Register or Inventory and their associated landscapes and ancillary structures in accordance with the Standards and Guidelines for the Conservation of Historic Places in Canada.

<p>HOW IT IS DEMONSTRATED</p>	<p>Included in the Heritage Impact Assessment.</p> <p>SUBMISSION REQUIREMENTS:</p> <ul style="list-style-type: none"> » On a plan, identify the cultural heritage resources that are located within the project boundary (if any). If there are no cultural heritage resources on the site, this Metric is not applicable and points will not be counted in the Applicant score. » If cultural heritage resources are located on the site, verify that the proposed plan complies with the Cultural Heritage Conservation policies under provincial legislation (Ontario Heritage Act, Planning Act and PPS, etc), Standards and Guidelines for Historic Places, Municipal Official Plan, Municipal by-laws, Municipal Register of Cultural Heritage Resources and/or Municipal Heritage Inventory. » Verify and document that 100% of cultural heritage resources included in the Municipal Heritage Inventory and/or Register have been evaluated. » Verify and document that 100% of the cultural heritage resources that qualify for designation under the Ontario Heritage Act are retained and protected. » Verify and document that 100% of the cultural heritage resources identified in the Municipal Heritage Register or Inventory and their associated landscapes and ancillary structures are conserved in accordance with the Standards and Guidelines for the Conservation of Historic Places in Canada.
<p>WHO IS RESPONSIBLE FOR REVIEWING</p>	<p>Planning/Cultural Heritage Planning/Urban Design</p>
<p>RATIONALE</p>	<p>Minimize the negative impacts of grading and other soil and landform disturbances from construction activities. Retaining natural topography is a factor in maintaining pre-development water balance and stream flow regimes as well as the aesthetic appeal of cultural heritage landscapes.</p>

CONNECTIVITY

METRIC	Connectivity
APPLIES TO	Site Plan
MANDATORY	<p>Connect buildings on the site to off site pedestrian paths, surface transit stops, parking areas (car and bike), existing trails or pathways, or other destinations (e.g. schools).</p> <p>Outdoor waiting areas located on the site must offer protection from weather. Where a transit stop is located within a walking distance of the project site boundary, the building main entrance should have a direct pedestrian linkage to that transit stop.</p>
VOLUNTARY	<p>Provide amenities and street furniture (benches, additional bike parking, landscaping) along connections provided on the site and between the site and adjacent destinations.</p>
HOW IT IS DEMONSTRATED	<p>Included in the Site or Landscaping.</p> <p>PLAN SUBMISSION REQUIREMENTS:</p> <ul style="list-style-type: none"> » On a site or landscaping plan, identify existing or proposed transit routes that are within walking distance to the building (e.g. 200m). If applicable, highlight a linkage that connects a building entry to the transit stop. » On a site or landscape plan, identify the linkages that connect a building entry to pedestrian paths, surface transit stops, parking areas (car and bike), schools, etc. » Identify outdoor waiting areas located within the site and highlight the weather protection elements included in the design. » List the amenities and street furniture (benches, public art, landscaping, bioswales, etc.) that help connect the site to adjacent destinations. » Submit a plan illustrating the off site paths/stops and the connections to them from the site.

WHO IS RESPONSIBLE FOR REVIEWING	Planning
RATIONALE	Encourage walking and transit use.

Note:

- » In order for the mandatory metric to be included, it should be implemented through the Official Plan and Zoning By-law, and included in Municipal Urban Design Guidelines and Pedestrian/ Parks and Trails Masterplans. Mandatory metrics should not be awarded points.

DISTANCE TO PUBLIC TRANSIT

METRIC	Distance to public transit
APPLIES TO	Block, Draft and Site Plans
MANDATORY	Site is within 800m walking distance to an existing or planned commuter rail, light rail, bus rapid transit or subway with stops or Site is within 400m walking distance to 1 or more bus stops with frequent service.
VOLUNTARY	Site is within 400m walking distance to an existing or planned commuter rail, light rail, bus rapid transit, or subway with frequent stops or Site is within 200m walking distance to 1 or more bus stops with frequent service.

<p>HOW IT IS DEMONSTRATED</p>	<p>Included in the Urban Design Submission and/or Transportation Study (Block and Draft Plans) and Traffic Impact Study and/or Transportation Demand Management Plan (Site Plan).</p> <p>SUBMISSION REQUIREMENTS:</p> <ul style="list-style-type: none"> » List the Municipal Plan Targets and document if compliance is achieved. » On a map, identify the existing or planned commuter rail, subway, light rail and bus stops with frequent service. » Quantify the expected residential and employment population for the proposed plan. » Quantify the % of residents and employees that are within an 800m and 400m walking distance to existing or planned commuter rail, light rail or subways with frequent service. » Quantify the % of residents and employees that are within a 400m and 200m walking distance to 1 or more bus stops with frequent service.
<p>WHO IS RESPONSIBLE FOR REVIEWING</p>	<p>Transportation Engineering/Active Transportation</p>
<p>RATIONALE</p>	<p>Support alternative transportation modes to vehicle use.</p>

Note:

- » This would apply for municipalities with public transportation systems. Municipalities without public transportation may exclude this as mandatory.

ACTIVE TRANSPORTATION — PROXIMITY TO CYCLING NETWORK

METRIC	Active Transportation — Proximity to Cycling Network
APPLIES TO	Block, Draft and Site Plans
VOLUNTARY	75% of residents/jobs are within 400 meters of existing or approved by council path/network.
HOW IT IS DEMONSTRATED	<p>Included in the Traffic Impact study or Transportation Demand Management Plan (Site Plan), Urban Design Guidelines, Planning Justification Report or Transportation Study (Draft and Block Plans).</p> <p>SUBMISSION REQUIREMENTS:</p> <ul style="list-style-type: none"> » Identify if there are any existing or municipally approved cycling networks within the project boundary. » Quantify the expected residential and employment population for the proposed plan. » Quantify the % of residents and jobs that are within 400m of existing or planned cycle networks. <p>NOTE 1: Points are only awarded if a cycling network is included in the project boundary and the bike parking requirement is satisfied.</p>
WHO IS RESPONSIBLE FOR REVIEWING	Development Planning/Transportation Engineering/Active Transportation.
RATIONALE	Enhance pedestrian and cycling trails to further promote active forms of transportation.

PARKS

METRIC	Parks
APPLIES TO	Block, Draft and Site Plans
VOLUNTARY	Provide 2 road frontages for each urban square, parkette, and neighbourhood park provided and 3 road frontages for each community park provided.
HOW IT IS DEMONSTRATED	<p>Included in the Site Plan Drawings and Urban Design Submission and Landscape Plan (Draft and Block Plans).</p> <p>SUBMISSION REQUIREMENTS:</p> <ul style="list-style-type: none"> » Highlight the urban squares, parkettes, neighbourhood parks and community parks included within the application. » Quantify the number of road frontages for each park type.
WHO IS RESPONSIBLE FOR REVIEWING	Park/ Natural Heritage Planning
RATIONALE	Provide visual and physical access to public parks.

STORMWATER QUANTITY

METRIC	Stormwater quantity
MANDATORY	Retain runoff volume from the 10mm fall event on site (or current minimum stormwater engineering requirement).
VOLUNTARY	Retain runoff volume from the 15mm rainfall event on site.
HOW IT IS DEMONSTRATED	<p>Included in the Site Plan Drawings or Stormwater Management Plan (Site Plans) and Functional Servicing Report or Stormwater Management Plan (Block and Draft Plans).</p> <p>SUBMISSION REQUIREMENTS:</p> <ul style="list-style-type: none"> » List and describe the design measures used to retain stormwater runoff on site. Measures could include (but not limited to): <ul style="list-style-type: none"> ▮ Low impact development measures ▮ Stormwater ponds ▮ Bioswales » Highlight the location of design measures (if any) on a plan. » Confirm that the quantity and flood controls are in accordance with applicable Municipal and conservation authority requirements. » Calculations and signoff by a professional quantifying the amount of runoff that will be retained on site.

WHO IS RESPONSIBLE FOR REVIEWING	Development Engineering
RATIONALE	Implement a treatment-train approach to stormwater management that emphasizes source controls and conveyance controls to promote infiltration, evaporation, and/or re-use of rainwater. The objective is to maintain stream flows and thermal regimes within natural ranges of variation.

Note:

- » The minimum stormwater engineering requirement may increase after publication of this document, and thus this metric should be updated to reflect current requirements. Metrics must be updated regularly to account for updated standards and best practices.
- » Your municipal stormwater requirements can be integrated into this metric.
- » Groundwater-dependent communities may want to consider other requirements, as there are unique considerations for aquifer salinity.

DEDICATE LAND FOR LOCAL FOOD PRODUCTION

METRIC	Dedicate land for local food production
APPLIES TO	Block, Draft and Site Plans
VOLUNTARY	<ul style="list-style-type: none"> » Provide 80ft² of garden space per Development Unit (Commercial, Retail, Institutional Developments are exempt from minimum targets). » Dedicate 15% of roofspace for local food production. (Commercial, Retail, Institutional and Single Family Developments are exempt from minimum targets).
HOW IT IS DEMONSTRATED	<p>Included in a Landscape Plan or Urban Design Submission.</p> <p>SUBMISSION REQUIREMENTS:</p> <ul style="list-style-type: none"> » Identify the locations within the project that are dedicated for food production. » List the garden space elements included/considered for the project. » Quantify the total number of DU within the project. » Quantify the total garden space available per DU (i.e. ft²/DU). For Multi-Use Residential Buildings (only). » Quantify the available roof area. » Quantify the % of available roof area that is dedicated to food production. » Highlight the dedicated roof area on a drawing.

WHO IS RESPONSIBLE FOR REVIEWING	Planning/Sustainability
RATIONALE	Promote community-based food production and provide alternative passive recreational uses.

Note:

- » Your municipality may want to give consideration around preventing or mitigating for scenarios where development is on potential farmland. Policies should be included in the Official Plan to protect agricultural land from development beyond Provincial protections.
- » Depending on developer feedback, you may wish to use this to offset some of the greenspace requirements.
- » Municipalities may need to allow for areas zoned for food production to the permitted in the Vegetation Protection Zone of natural features or to count towards parkland dedication.

SOLAR READINESS

METRIC	Solar Readiness
APPLIES TO	Site Plan
MANDATORY	100% of all new buildings designed for solar readiness (i.e. electrical conduit/plumbing riser roughed in — may include structural requirements).
VOLUNTARY	Produce 1%-13% of annual energy consumption from an on-site renewable energy source. Off-setting 1% of annual energy use earns X additional Point(s). Each additional 2% earns X point(s).

<p>HOW IT IS DEMONSTRATED</p>	<p>Included in the Roof Plan, Site Plan or Letter of Intent.</p> <p>SUBMISSION REQUIREMENTS:</p> <ul style="list-style-type: none"> » Submit a Letter of Intent (signed by a professional) committing that all new buildings will be designed for solar readiness (i.e. electrical conduit/plumbing riser built into base building, roof capacity accounts for weight/lift of renewable energy technologies, delivery and space allocation for fuel delivery/storage, etc.). » Submit a Letter of Intent (signed by a professional) committing the % of renewable energy that will be included on site. The % of renewable energy generated can be quantified by the following steps: <ul style="list-style-type: none"> ↳ List the types of buildings (office, commercial, retail, multi-family, single family). ↳ Quantify the total Gross Floor Area for each building type. ↳ List the expected/approximate energy use intensities (EUIs) for each building type. ↳ Quantify the total building annual energy use for the site. ↳ List the renewable energy technologies being considered for the site. ↳ Quantify the expected annual energy generated from renewable technologies. ↳ Quantify the % of annual energy generated on site, relative to the total energy consumed.
<p>WHO IS RESPONSIBLE FOR REVIEWING</p>	<p>Planning</p>
<p>RATIONALE</p>	<p>Encourage on-site renewable energy generation.</p>

Note:

- » This metric may require a Letter of Credit (LoC). This document could be

prepared to identify several metrics and the associated LoC payment and what is required to release the LoC.

PASSIVE SOLAR ALIGNMENT

METRIC	Passive solar alignment
APPLIES TO	Block and Draft Plans (Greenfield) and Site Plans
MANDATORY	Applies to 50% of new buildings.
VOLUNTARY	Applies to 75% of new buildings.
HOW IT IS DEMONSTRATED	Included in the Urban Design Submission and Site Plan. Submission requirements TBD.
WHO IS RESPONSIBLE FOR REVIEWING	Planning
RATIONALE	Promote energy efficiency by creating the conditions for the use of passive solar design as well as solar photovoltaic and/or solar thermal strategies.

Note:

- » This metric may be used if tools for enforcing energy targets are limited.

REDUCE POTABLE WATER USED FOR IRRIGATION

METRIC	Reduce potable water used for irrigation
APPLIES TO	Site Plans
MANDATORY	<ul style="list-style-type: none"> » Reduce potable water used for irrigation by 50%, compared to a midsummer baseline case. » Use native drought tolerant plant material (which does not include grass but can include groundcovers) for at least 50% of landscaped area (including vegetated roofs and walls).
VOLUNTARY	No potable water is used for irrigation.
HOW IT IS DEMONSTRATED	<p>Included in a Letter of Intent or Landscape/Irrigation Plan signed by a Professional.</p> <p>SUBMISSION REQUIREMENTS:</p> <ul style="list-style-type: none"> » Submit a Letter of Intent (signed by a professional) committing that the project will be designed to reduce potable water requirements for irrigation. » Quantify the % reduction in potable used to irrigate, relative to a midsummer baseline case. » Identify the strategies used to reduce potable water demands (i.e. drought tolerant vegetation, controls, drip irrigation, rainwater harvesting/storage).
WHO IS RESPONSIBLE FOR REVIEWING	Urban Design/Planning
RATIONALE	Promote water use efficiency

Note:

- » This metric may also address other landscaping concerns here such as invasive species and bio diversity.

WATER CONSERVING FIXTURES

METRIC	Water Conserving Fixtures
APPLIES TO	Site Plans
TIER 1	Install water fixtures that achieve at least a 40 per cent reduction in potable water consumption for the building (not including irrigation) over the baseline water fixtures.
TIER 2	Install greywater re-use systems.
VOLUNTARY	Include plumbing fixtures with lower flow rates.
HOW IT IS DEMONSTRATED	<p>Included in a Letter of Intent signed by a Professional.</p> <p>SUBMISSION REQUIREMENTS:</p> <ul style="list-style-type: none"> » Submit a Letter of Intent (signed by a professional) committing that the project will include water conserving fixtures with flow rates that satisfy OBC and applicable municipal standards. » Quantify the relative potable water savings from the fixtures selected. » Include sample cutsheets for some of the fixtures being considered to yield the targeted potable water reduction.
WHO IS RESPONSIBLE FOR REVIEWING	Building
RATIONALE	Promote water use efficiency.

REDUCE LIGHT POLLUTION

METRIC	Reduce light pollution
APPLIES TO	Draft and Site Plans
MANDATORY	<p>All exterior fixtures must be Dark Sky compliant.</p> <p>Shield exterior light fixtures >1000 lumens to prevent night sky lighting. No up lighting allowed.</p>
VOLUNTARY	<p>Develop lighting controls that reduces night time spillage of light by 50% from 11pm to 5am. No architectural lighting allowed between 11pm and 5am.</p>
HOW IT IS DEMONSTRATED	<p>Included in the Lighting Plan or Letter of Intent.</p> <p>SUBMISSION REQUIREMENTS:</p> <ul style="list-style-type: none"> » Confirm that the applicable municipal standards have been satisfied. » To prevent night sky lighting, include shields on all exterior fixtures that have a lumen output of 1000 or greater. » Confirm that the design will not include any uplighting.
WHO IS RESPONSIBLE FOR REVIEWING	Urban Design
RATIONALE	Reduce night time glare and light trespass from the building and the site.

BIRD FRIENDLY DESIGN

METRIC	Bird Friendly Design
APPLIES TO	Site Plan (excluding single family developments).
MANDATORY	<p>Municipal guidelines on Bird Friendly Design, or Buildings abutting ravines or natural areas.</p> <p>Use a combination of the following strategies to treat a minimum of 85% of all exterior glazing within the greater of first 12m of the building above grade or the height of the mature tree canopy:</p> <ul style="list-style-type: none"> » Low reflectance, opaque materials. » Visual markers applied to glass with a maximum spacing of 100mm x 100mm. » Building-integrated structures to mute reflections on glass surfaces. <p>ALL BUILDINGS:</p> <p>Balcony railings: Treat all glass balcony railings within the first 12m of the building above grade, glass parapets and at-grade guardrails with visual markers provided with a spacing of no greater than 100mm x 100mm.</p> <p>Fly-through conditions: Treat glazing at all heights resulting in a fly-through conditions with visual markers at a spacing of no greater than 100mm x 100mm. Fly-through conditions that require treatment include:</p> <ul style="list-style-type: none"> » Glass corners » Parallel glass » Building integrated or free-standing vertical glass » At-grade glass guardrails » Glass Parapets <p>Grate Porosity: Ensure ground level ventilation grates have a porosity of less than 20mm X 20mm (or 40mm x 10mm).</p>

<p>HOW IT IS DEMONSTRATED</p>	<p>Included in the Elevation Plans.</p> <p>SUBMISSION REQUIREMENTS:</p> <ul style="list-style-type: none"> » Elevation plans should clearly highlight the bird friendly design features, adopted on the first 12m above grade. Bird friendly design features can include, but aren't limited to: <ul style="list-style-type: none"> ↳ Visual patterns on glass ↳ Window films ↳ Fenestration patterns ↳ Angled glass downwards ↳ Sunshades ↳ Reduced night sky lighting » Confirm that the visual markers on the glass have spacing no greater than 10cm x 10cm. » Confirm that 85% of the building glass (12m above grade) has been treated with bird friendly design strategies.
<p>WHO IS RESPONSIBLE FOR REVIEWING</p>	<p>Parks/Natural Heritage Planning/Policy Planning/ Urban Design</p>
<p>RATIONALE</p>	<p>Prevention of bird deaths from glazing.</p>

Note:

- » It is recommended that this metric is mandated through the Official Plan.
- » Bird Friendly Design guidelines can be found in Vaughan and Markham as well.

RECYCLED/RECLAIMED MATERIALS

METRIC	Recycled/Reclaimed Materials
APPLIES TO	Draft and Site Plans
MANDATORY	Minimum 25% of recycled/reclaimed materials should be used for new infrastructure including roadways, parking lots, sidewalks, unit paving, etc.
VOLUNTARY	Minimum 30% of recycled/reclaimed materials should be used for new infrastructure including roadways, parking lots, sidewalks, unit paving, etc.
HOW IT IS DEMONSTRATED	<p>Included in an Engineering Drawing Set.</p> <p>SUBMISSION REQUIREMENTS:</p> <ul style="list-style-type: none"> » Confirm that applicable municipal standards have been satisfied. » Identify the expected % of reclaimed/recycled material that will be used for new infrastructure (i.e. roadways, parking lots, sidewalks, unit paving, etc.).
WHO IS RESPONSIBLE FOR REVIEWING	Parks/Natural Heritage Planning/ Development Engineering
RATIONALE	Reduce the adverse environmental effects of extracting and processing virgin materials.

MATERIAL RE-USE AND RECYCLED CONTENT

METRIC	Material Re-use and Recycled Content
APPLIES TO	Site Plan
MANDATORY	<ul style="list-style-type: none"> » At least 5% reused content in building materials and/or landscaping materials (hardscaping such as paving or walkways) is provided. » At least 10% recycled content in building materials and/or landscaping materials (hardscaping such as paving or walkways).
VOLUNTARY	<ul style="list-style-type: none"> » At least 10% reused content in building materials and/or landscaping materials (hardscaping such as paving or walkways) is provided. » At least 15% recycled content in building materials and/or landscaping materials (hardscaping such as paving or walkways). » Reduced embodied carbon through use of concrete infused with CO² and concrete mixed with hemp fibre.
HOW IT IS DEMONSTRATED	<p>Included in an Engineering Drawing Set.</p> <p>SUBMISSION REQUIREMENTS:</p> <ul style="list-style-type: none"> » Confirm that applicable municipal standards have been satisfied. » Identify the expected % of reclaimed/recycled material that will be used for new infrastructure (i.e. roadways, parking lots, sidewalks, unit paving, etc.).
WHO IS RESPONSIBLE FOR REVIEWING	Development Engineering
RATIONALE	Reduce the adverse environmental effects of extracting and processing virgin materials.

ELECTRIC VEHICLE CHARGING

METRIC	Electric Vehicle Charging
APPLIES TO	Site Plan
MANDATORY	<ul style="list-style-type: none"> » Each residential parking space for Part 9 buildings, excluding visitor parking spaces, shall feature energized outlets capable of providing "Level 2" EV charging or higher to the parking space. An "energized outlet" means a connected point in an electrical wiring installation at which current is taken to supply utilization equipment. It does not refer to "electric vehicle supply equipment" (EVSE – i.e. an EV charging station). » These parking areas must feature energized outlets of 208-240V AC 1-phase, and minimum 32amp (40amp branch breaker). One outlet can be shared between two, three or four adjacent parking spaces; users will have the option to install a multi-headed charging station to serve multiple vehicles. » Energized outlets are to be labelled for the intended use for electric vehicle charging.
VOLUNTARY	<ul style="list-style-type: none"> » Each residential parking space, excluding visitor parking spaces, shall feature energized outlets capable of providing "Level 2" EV charging or higher to the parking space. » Provide 25% of parking spaces with electric vehicle supply equipment (EVSE). » These parking areas must feature energized outlets of 208-240V AC 1-phase, and minimum 32amp (40amp branch breaker). One outlet can be shared between two, three or four adjacent parking spaces; users will have the option to install a multi-headed charging station to serve multiple vehicles. » Energized outlets are to be labelled for the intended use for electric vehicle charging.

HOW IT IS DEMONSTRATED	Project parking statistics include number and location of EVSE spaces. Notations indicate location of EVSE spaces and roughed-in spaces on parking plans.
WHO IS RESPONSIBLE FOR REVIEWING	Development Planner
RATIONALE	Support the uptake of electric vehicles by providing charging infrastructure. Reduce GHG emissions from gasoline powered vehicles.

Note:

- » This metric has been adapted from the City of Richmond, British Columbia Electric Vehicle Charging Infrastructure Requirements — Zoning Bylaw 8500, Section 7.15.

BICYCLE PARKING

METRIC	Bicycle Parking
APPLIES TO	Site Plan, Block Plan
MANDATORY	Bicycle parking rates in accordance with municipal bylaw.
VOLUNTARY	Provide a minimum of 0.3 bike parking spots per dwelling unit AND Provide a minimum 10% of bike parking at grade (X POINTS) AND Place bike parking in weather protected areas (X POINTS).
HOW IT IS DEMONSTRATED	Include number and location of bicycle parking spaces.
WHO IS RESPONSIBLE FOR REVIEWING	Development Planner
RATIONALE	Promote active transportation in order to reduce GHG emissions from private vehicles.

APPENDIX B:

PROVINCIAL CASE STUDIES





REGIONAL GREEN DEVELOPMENT STANDARDS: QUEBEC

INTRODUCTION: SUMMARY OF OVERALL PROGRESS OF GREEN DEVELOPMENT STANDARDS IN QUEBEC

The Quebec Government's [2013-2020 Climate Change action plan](#) supports municipalities to integrate a long-term vision of land use planning in order to increase resilience to face the climate risk. To meet government requirements, some municipalities have started to amend their by-laws to incorporate sustainable policies. Depending on the region, they encounter various constraints, explaining the disparity between by-laws. Overall, municipalities have been able to acquire the knowledge to successfully develop concrete and innovative measures in their jurisdictions.

SECTION 1: QUEBEC'S LEGISLATION GOVERNING PLANNING AND MUNICIPAL AUTHORITY

In Quebec, the [Municipal Powers Act](#) grants the municipalities' regulatory power to respond to local municipal needs. Municipalities can thus affect land use through changes to environment, transport, local economic development and culture, recreation, community activities and parks. *The Municipal Powers Act* grants planning and development intervention powers to municipalities. Moreover, the [Act Respecting Land Use Planning and Development](#) requires the Metropolitan Communities and Regional County Municipalities (RCMs) to draw up a *land use development Plan*. This plan establishes the guidelines for the physical organization of the territory.

Quebec municipalities must also develop a [Planning program](#) which makes it possible to meet the objectives of the Land Use Development Plans and thus determine the guidelines for the spatial organization of its territory.

This plan is the official document for land use planning, and it applies directly to the citizens. The by-law powers given to municipalities put them at the forefront of the actions to fight climate change.

It should also be noted that the [Construction Code](#) which derives from the [Building Act](#) provides a framework for the construction of public buildings. In June 2020, a new chapter on energy efficiency in buildings was added to the Code. These new requirements include changes to the thermal characteristics of the building envelope, duct insulation, lighting, and heat recovery systems.

SECTION 2: JURISDICTIONAL EXAMPLES OF SUSTAINABLE DESIGN POLICIES IN QUEBEC

Nicolet's Sustainable Neighborhood Policy

The municipality of Nicolet, with a population of approximately 8,500, has developed a method for evaluating the sustainability of private housing projects. An analysis grid was adopted as part of a municipal by-law, to guide real estate developers in residential construction in peri-urban areas. The grid provides guidelines to improve the environmental and social performance of the projects and is also a way to evaluate their sustainability.

It lists a series of actions aiming to reach the four following targets:

- » 1. Design of road infrastructure and stormwater management.
- » 2. Design of common living areas and urban grid.
- » 3. Preservation of wildlife and flora and management of vegetated and forest areas.
- » 4. Responsible management of the site.

Each action is tied to a score potential. Therefore, the developer must achieve a minimum score for the project to be accepted by the municipality. Moreover, this policy includes technical and financial support, where the financial assistance is proportional to the project score.

Victoriaville Program and Zoning By-law

In 2011, the City of Victoriaville, with a population of approximately 47,500, has created a program that encourages sustainable home building. The goal of the [Habitation Durable Victoriaville](#) program is to support sustainable construction and renovation projects. By following the established criteria, participants can benefit from a grant from the City.

Following this program, the City of Victoriaville amended its [Construction by-law](#) to include 13 criteria from the program evaluation grid which are now mandatory for new construction.

Following the revision of the [Planning Program](#) in 2019, Victoriaville established six main targets to better frame development in its territory. This laid the groundwork for the subsequent adoption of several sustainable development standards. For example, one of these targets seeks to optimize land-use and infrastructure. Consequently, several articles in the [zoning by-law](#) have been amended to respect this target.

SECTION 3: CASE STUDIES OF HIGH-PERFORMANCE DESIGN

Nicolet

Given the recent adoption of the analysis grid in 2019, it has not been applied yet to new housing projects. However, some developers who already had projects underway have decided to comply with the new policy. Thus, the developers of *Faubourg du Ruisseau* and *Les Jardins d'Anna* have made certain changes to their development plan in order to meet as many sustainable development criteria as possible. Also, the *Carré Cloutier* project in the City of Nicolet shows the City's desire to innovate with a vision of sustainability even if does not follow the standards presented above. For example, the project involves the construction of a sustainable neighborhood that will include condominiums, commercial stores, a community garden and an underground parking.



FIGURE 1: THE CARRÉ CLOUTIER PROJECT IN THE CITY OF NICOLET



Victoriaville

Since 2011, the *Habitation Durable Victoriaville* program has benefited to nearly 530 new housing units. Each of these units was able to benefit from grants of up to \$8,000 if all grid criteria were met. The estimated positive environmental impacts of this program include: 25% of energy saving per home, savings of 170,000 liters of water per day and recycling the equivalent of 125 truckloads of construction waste. This program also built the capacity of contractors, building professionals and suppliers to adopt sustainable building techniques. Given the success of the program, it was subsequently implemented in several other municipalities including Plessisville, Varennes, Dixville, Petite-Rivière-St-François, St-Valérien and Ham-Sud.

Regarding the adoption of the new zoning *by-law* in 2019, the City is confident that these decisions will help to obtain tangible results. Because this standard is very recent, future research is needed to quantify the impacts on land use planning.

Completed by:





REGIONAL GREEN DEVELOPMENT STANDARDS: BRITISH COLUMBIA

INTRODUCTION: SUMMARY OF OVERALL PROGRESS OF GREEN DEVELOPMENT STANDARDS IN BC

In 2007, the Province of British Columbia introduced legislation to lead communities on a path towards a low carbon future, including the [Climate Action Charter](#) and the [BC Green Building Code Initiative Update](#). The [Ministry of Environment & Climate Change Strategy](#) provides initial background data to communities in the form of

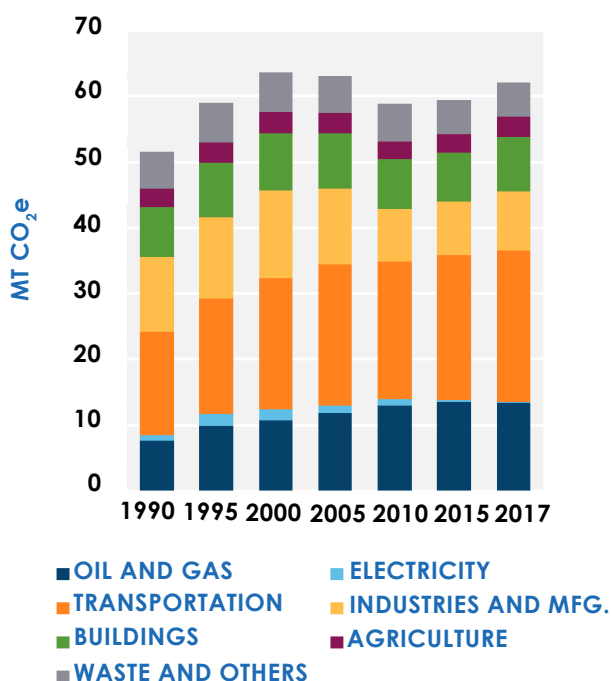
Community Energy and Emissions inventories and supports the [BC Climate Action Toolkit](#), a website for knowledge sharing, collaboration and strategic guidance on green development standards.

Since the introduction of the Climate Action Charter, local governments have implemented a variety of green development standards to encourage or require green buildings.

THE [GHG EMISSIONS BY SECTOR GRAPH](#) ADJACENT SHOWS THE SOURCE OF BC'S EMISSIONS.

» This stacked column graph shows GHG emissions in B.C. by sector every five years from 1990 to 2017 in MT of CO₂e.

Graph Source: [Environment and Climate Change Canada – National Inventory Report](#)



The [Building Act](#) was enacted in 2015 to increase consistency to the technical building requirements across BC, and by 2017 all existing local green development standards transitioned to referencing the BC Energy Step Code. In the last 3 years, over 30 communities have implemented the Step Code.

The electricity energy grid of BC is considered 'green' with approximately, [95% of electricity](#), in the province generated from renewables.

SECTION 1: BC LEGISLATION GOVERNING PLANNING AND MUNICIPAL AUTHORITY

The legislative framework in BC is found under the [Community Charter](#) and the [Local Government Act](#). These acts define Local Government core authority and guide decision-making.

The [Climate Action Charter](#), 2007 is voluntary legislation that supports the practice of sustainable development.

To date, 187 (of 190) local governments have signed the Charter, which commits each signatory to:

- » Work towards becoming carbon neutral in corporate operations (lead by example);
- » Measure and report community greenhouse gas emissions (adopt community energy plans and emission reduction targets); and
- » Create complete, compact, more energy efficient communities (save and concentrate resources).

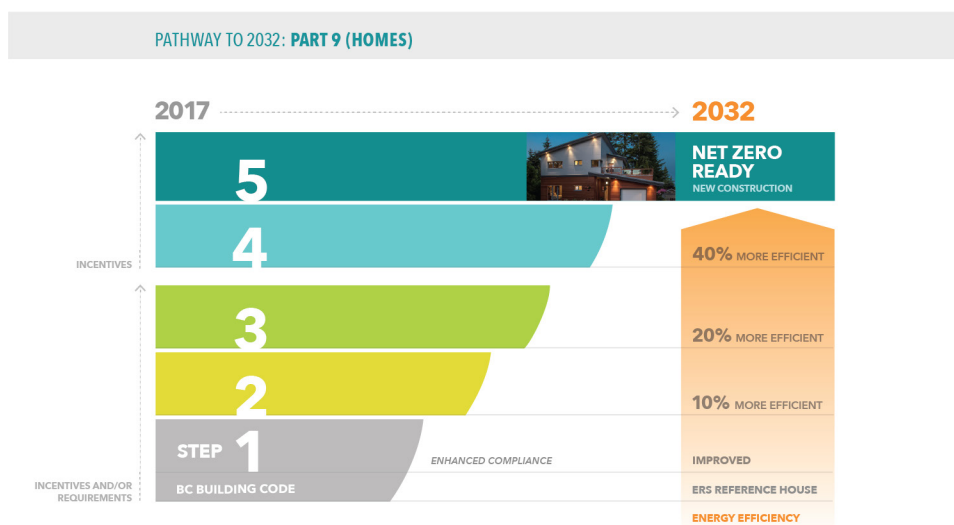
Each year, Local Governments report actions and, through the [Climate Action Revenue Incentive Program](#) (CARIP), become eligible for a grant of carbon tax paid. Many communities have channeled returned carbon tax funds into unique community emission reduction programs and sustainable development projects.

The Province actively supports municipalities in planning for sustainability and resilience: [CleanBC](#) 2018, the Provincial Plan to reduce climate pollution and build a low carbon economy; [A Guide to Green Choices: Ideas & Practical Advice for Land Use Decisions in British Columbia Communities](#); and general planning authority in the *Local Government Act (LGA)*. Specifically, LGA [Part 14, Planning and Land Use Management](#), describes the requirement for greenhouse gas emission reduction targets in Official Community Plans, the opportunity through development permits to establish objectives of energy / water / emissions conservation, etc. and environmental consideration in permits, subdivision, development, runoff control and flood plains.

CleanBC affirmed the target for all new buildings to be net-zero energy ready by 2032 and outlined plans for increasing energy efficiency standards in the Building Code in 2022 and 2027. CleanBC also commits to significant GHG emissions reductions from the buildings sector, mirroring many local climate action plans that focus on low carbon new buildings.

The electricity energy grid of BC is considered 'green' with approximately, [95% of electricity](#) in the province generated from renewables. For this reason, many local governments are implementing a low carbon approach to the Step Code, effectively encouraging electricity and other low carbon energy sources instead of fossil fuels.

FIGURE 1: PATHWAY TO 2032 (HOMES)



SECTION 2: JURISDICTIONAL EXAMPLES OF SUSTAINABLE DESIGN POLICIES

The City of North Vancouver, an urban jurisdiction of Metro Vancouver in the southwestern region of BC (population 85,000) has a target of 50% reduction in greenhouse gas emissions by 2050.

The City established an area-wide rezoning, Development Permit Area and development standards for the [Moodyville Neighbourhood](#).

The area offers a variety of options for 1500 units of family-friendly, sustainable housing. Five new zones and design guidelines, generated with extensive community input, permit a range of energy-efficient, ground-oriented housing and support a community scale park, improved regional greenways, active transportation and a future rapid transit corridor.

The Moodyville neighbourhood, located on a south-facing slope with an existing grid street network and maximum solar exposure, conditions that support a reduction of energy use in buildings. The neighbourhood has been connected to the Lonsdale Energy Corp. (LEC) district thermal energy system and meets high energy efficiency standards. Improved bicycle and pedestrian pathways,



Caption: Cycling in the City of North Vancouver

reduced parking provisions, electric vehicle charging infrastructure and car-share incentives are included in neighbourhood design to encourage green transportation options.

All new ground oriented and apartment multi-family housing and new commercial development in the Moodyville area follow development permit requirements covering design factors of streetscape shading/safe social interaction, address unit privacy / livability, encourage varied architecture / sustainable elements and landscape criteria. Further, all new construction is required to use the [BC Energy Step Code](#), the voluntary provincial standard of performance approach to comply with the BC Building Code energy efficiency requirements.

Builders must use energy software modelling and on-site testing to demonstrate that both their design and the constructed building meet the requirements of the standard.

The Moodyville neighbourhood development guidelines and tools are found on the City of North Vancouver website as follows:

[Moodyville Development Permit Application Resources](#), [Staff Report](#), [Zoning Amendment Highlights](#) and [City of North Vancouver approach to BC Energy Step Code](#).

Rebates for development are available through provincial utility companies to build and renovate for energy efficient commercial and residential projects. Incentive programs are described at www.encybc.ca where all BC contractors and residents have access to programs and energy coaching.

SECTION 3: CASE STUDIES OF HIGH PERFORMANCE DESIGN

The [District of Elkford](#) (population 2500), situated in the remote / rural Elk Valley in southeastern BC, requires all new homes be built to [BC Energy Step Code](#). Elkford also chose to 'lead by example' and made GHG emission reduction a priority in the design of the new 6000-square foot Municipal Office, constructed to Commercial Step 3 of the Energy Step Code. The building will use 20% less energy than a conventional "prescriptive pathway built" commercial building. Seventy-two 385-watt solar panels were installed to promote the region's solar advantage as one of the top five Canadian areas for solar production capability. The panels have the potential to provide up to 60% of Municipal Office's electrical needs by producing 42,000 Kwh solar power per year. *Solar Now* and *Columbia Basin Trust* are solar panel funding partners. The grand opening of the [new municipal office](#) was held May 13, 2019.

Elkford's *Step Code Incentive Policy* encourages builders to construct more energy-efficient new buildings. The policy is supported by the BC Hydro electrical utility municipal program funding to develop BC Energy Step Code incentive / education programs. Elkford offers incremental building permit fee rebates for energy performance aligned with BC Energy Step Code tiers. For example, in 2020, a new home constructed to Step 3 is eligible for an 80% rebate of the usual building permit fee. Many BC communities follow a similar program structure to incent and educate builders to voluntarily use the performance pathway of the BC Building Code. The province has announced that it will become mandatory for all new builds to achieve Step 3 of the Step Code in 2012. In 2032, all new construction in BC will be required to be Net Zero Ready.

The [BC Energy Step Code](#) website is a resource for local government elected officials, staff and the building industry to receive support for better building practices, develop incentive and education programs, and a move to Net Zero Ready construction.



Caption: District of Elkford Municipal Office

Completed by:





REGIONAL GREEN DEVELOPMENT STANDARDS: YUKON

SUMMARY OF OVERALL PROGRESS OF GREEN DEVELOPMENT STANDARDS IN YUKON

The population of Yukon Territory is 35,874 with 70% of the territory's population residing in Whitehorse, the capital city. There are 8 municipalities in Yukon.

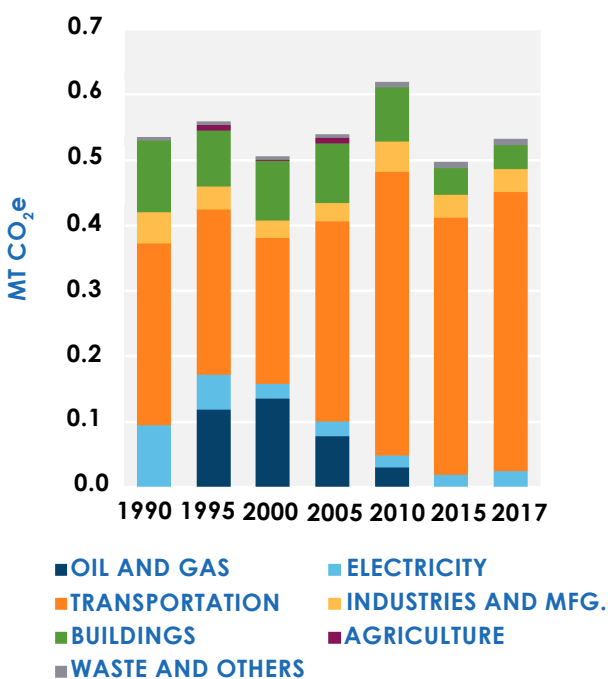
The City of Whitehorse requires [building energy efficiency](#) as well as an [EnerGuide](#) rating label on all new homes. Due to the cold climate in Yukon, building standards and geothermal opportunities must consider permafrost. Most homes in Yukon use electric baseboard heating, as heat pumps have limited functionality in cold weather.

THE [GHG EMISSIONS BY SECTOR GRAPH](#) ADJACENT SHOWS THE SOURCE OF YUKON'S EMISSIONS.

» This stacked column graph shows GHG emissions in Yukon by sector every five years from 1990 to 2017 in MT of CO₂e. Total GHG emissions have remained unchanged, from 0.53 MT of CO₂e in 1990.

Graph Source: [Environment and Climate Change Canada – National Inventory Report](#)

Completed by:





REGIONAL GREEN DEVELOPMENT STANDARDS: ALBERTA

INTRODUCTION: SUMMARY OF OVERALL PROGRESS OF GREEN DEVELOPMENT STANDARDS IN THIS REGION OF CANADA

Alberta does not have formal requirements for GDS in communities. However, the major urban centres in Alberta have established energy efficiency policies and have developed innovative approaches to developing with sustainability at the forefront.

SECTION 1: PROVINCIAL LEGISLATION GOVERNING PLANNING AND MUNICIPAL AUTHORITY

Alberta's municipal authorities derive their power to enact by-laws from the [Municipal Government Act](#). Regulations made under this act may include charters for municipalities (as *City of Calgary Charter, 2018*, or *City of Edmonton Charter, 2018*, modifying the Act).

While the Act does not explicitly refer to environmental concern, "environmental prosperity" is identified as a municipal role and charters do allow for municipalities to expand their acceptable bylaw targets to include environmental issues as priorities (as have Calgary and Edmonton).

The province does explicitly stipulate municipal powers of implementing a "clean energy improvement tax" bylaw. The MGA states that municipalities must adopt a municipal development plan by bylaw. If this municipality is not part of a Growth Region (i.e. is not Edmonton or Calgary), then this plan must conform to all relevant Intermunicipal Development Plans which must be developed among neighbours (2 or more adjacent municipalities). The development plan may have an Area Structure Plan and Area Redevelopment Plan, which are subject to the IDP and MP, as they exist. Further, Regional plans are implemented for six watershed districts.

The [*Alberta Land Stewardship Act*](#) asserts the supremacy of regional plans over affected municipalities. Alberta enacted the [*National Energy Code for Buildings 2017*](#). This requires all buildings within the province to meet the standards laid out in the NECB, particularly new efficiency standards for building envelope, lighting, heating, ventilation, air-conditioning, water heating, and electrical. The [*Province requires LEED Silver*](#) as the standard for all new major construction projects.

SECTION 2: JURISDICTIONAL EXAMPLES OF SUSTAINABLE DESIGN POLICIES

Edmonton

Edmonton has a [*Sustainable Building Policy*](#) where new municipal buildings $\geq 500\text{m}^2$ and renovations must be LEED Silver (or similar certification program) or higher, achieve 40% or greater efficiency gains over NECB 2011. This includes a commitment to monitoring and benchmarking, and generally more full integration of GHG and energy consumption reductions into planning.

It also encourages passive design strategies, well-insulated building envelopes and the use of energy efficient technologies like LED lighting, and dedicates 1% of project budget to dedicated on-site energy generation.

Edmonton as adopted an [*Energy Transition Strategy*](#), calling for additional powers to enact local changes to building codes, presumably amended to the *Charter* (section 7(2)).

Calgary

Calgary has a Sustainable Building policy requiring efficiency baselines and consideration of sustainability goals affecting large municipal buildings and City-owned affordable units. The City requires a Sustainable Development Inventory form to be submitted with all building permits, and supports sustainable technology implementation with SDI form and suite of checklists and brochures. The *City of Calgary Charter* requires a *Climate Change Mitigation Strategy* and a [*Climate Resilience Strategy*](#) calls for significant reductions to buildings' environmental impacts.

These include implementing energy step codes for new builds, support for sustainable and low-carbon technologies, and investigating opportunities to incentivize better building performance. The *Charter* allows setting of stricter building code requirements than ABC; preference is to incentivize (Section 7(2)).



Caption: Edmonton's Blatchford Community

SECTION 3: CASE STUDIES OF HIGH PERFORMANCE DESIGN

Blatchford

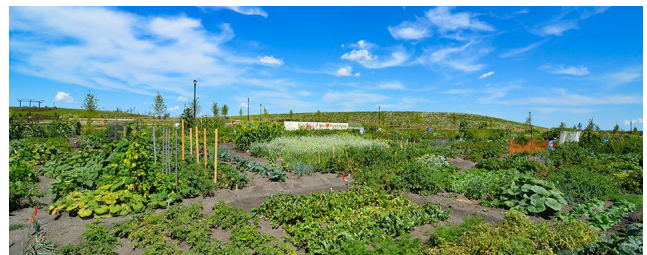
The [Blatchford](#) community in Edmonton is a community designed for an estimated 30,000 residents in 12,000-15,000 dwellings of mixed typology, with no single detached dwellings. This development is built on the site of a decommissioned airport, and is relatively centrally located to the city. The City created a body that acts as developer selling lots at market value, with GDS targets for builders, mostly related to energy efficiency. There is a district energy component that will provide heat to residences, decreasing per-dwelling emissions. Each phase of the build is planned to include the newest technological advances and to set efficiency targets relevant to the time. Two LRT connections will help to reduce transportation related emissions as well.

Griesbach

[Griesbach](#), in Edmonton, is a community of 4,700 homes for 13,000 developed on a decommissioned military base by Canada Lands Corporation. It has achieved LEED Gold for Neighbourhood Development. Developed on an old military site, asphalt, gravel and concrete from demolition and construction has been recycled and reused into the construction of roadways and sidewalks. Greenspace and recreation (including community gardens) account for 23% of the area.

WSP Calgary Office Fit-Out

The redevelopment of the [WSP Canada Inc. office](#) received LEED Silver (ID+C) status. 87% of all renovation / construction waste was diverted from landfills. 96% of all equipment is ENERGY STAR certified, while interior lights are now controlled by vacancy and daylight sensors. Additionally, 100% of all anticipated energy use for five years was offset through the acquisition of energy certificates and carbon offsets.



Caption: Edmonton's Griesbach Community

Completed by:



Éco-Ouest
Eco-West



REGIONAL GREEN DEVELOPMENT STANDARDS: SASKATCHEWAN

INTRODUCTION: SUMMARY OF OVERALL PROGRESS OF GREEN DEVELOPMENT STANDARDS IN THIS REGION OF CANADA

There is little provincial support green development policy in Saskatchewan and there are few outstanding examples of sustainable building practice.

SECTION 1: PROVINCIAL LEGISLATION GOVERNING PLANNING AND MUNICIPAL AUTHORITY

The governing acts for municipal authority in Saskatchewan municipal bodies are either of three types: Urban, Rural or Northern. Urban municipalities are either Cities (population of 5,000 or more and change in status from Town requested by council), towns, villages or resort villages.

Cities are governed by the [Cities Act](#), twenty-four municipalities are considered Northern municipalities and governed by the [The Northern Municipalities Act](#), while all other municipalities are governed by the [Municipalities Act](#). All three Acts identify fostering environmental well-being as one of the purposes of a city.

[The Planning and Development Act](#) allows for "standards and requirements for the achievement of energy efficiency within subdivisions, including orientation of lots, parcels and roads to attain maximum solar benefit". Saskatchewan's *The Management and Reduction of Greenhouse Gases Act* is substantially repealed and has no mention of municipal roles. Saskatchewan enacted the *National Energy Code for Buildings 2017* without amendment, and the *National Building Code 2015* with amendments.

SECTION 2: JURISDICTIONAL EXAMPLES OF SUSTAINABLE DESIGN POLICIES

City of Saskatoon

Saskatoon's [*Strategic Plan 2018-2021*](#) identifies Sustainable Growth and Environmental Leadership as two of its priority areas. The City is developing a *High Performance Civic Building Policy* to meet its GHG reduction targets and is investigating energy standards for new and existing private dwellings. In 2018 Saskatoon had [4 certified LEED municipal buildings, and 19 community buildings.](#)

City of Regina

The [*Design Regina, Official Community Plan \(OCP\)*](#) went through its first five-year review cycle in January 2020. The OCP identifies conservation, stewardship and environmental sustainability as one of its community priorities, as well as the development of complete neighbourhoods. A [secondary plan](#) identifies energy efficient building design as important, as well as safeguarding the natural environment for several neighbourhoods.

The City's [*Housing, Comprehensive Strategy*](#) report makes no mention of energy efficiency or other GDS. Regina has created a decision tree to help identify which element of *NECB* or *NCB* (9.36) applies to new builds or renovations.

SECTION 3: CASE STUDIES OF HIGH PERFORMANCE DESIGN

Pine Grove Correctional Centre

The renovation of [*Pine Grove Correctional facility*](#) achieved LEED Gold for New Construction and Major Renovations (2009 standard), the Saskatchewan Government's first LEED Gold certified facility. "A unique challenge" as "traditional correctional facility design does not lend itself well to sustainability, the design team had to be innovative in their approach". With substantial increases in daylighting, and updated lighting systems, among other upgrades, energy savings were 56% over baseline, with 71% met by renewables. A new rainwater collection system reduces water usage by 49%, and 89% of construction waste was recycled.

USSU Childcare Centre - McEown Park

| Project 16744

The University of Saskatchewan adopted a mandate for all new builds to meet LEED 2009 (New Construction and Major Renovations) standards. Natural lighting was complemented with occupancy sensor-controlled lights. Low-VOC paints, adhesives, sealants and flooring were also used, in keeping with good practice when housing children, as were operable windows. A single high-efficiency boiler for partial building heat is supplemented by individual residential furnaces providing general HVAC services to the building.

Completed by:





REGIONAL GREEN DEVELOPMENT STANDARDS: MANITOBA

INTRODUCTION: SUMMARY OF OVERALL PROGRESS OF GREEN DEVELOPMENT STANDARDS IN THIS REGION OF CANADA

Manitoba has no formal requirements for GDS in communities, but a number of policy documents at the provincial and municipal level do suggest a willingness to develop differently, and there are excellent examples of well thought out, sustainable design.

SECTION 1: PROVINCIAL LEGISLATION GOVERNING PLANNING AND MUNICIPAL AUTHORITY

Manitoba's municipal authorities derive their power to enact by-laws from the [Municipal Act](#). The City of Winnipeg and several other municipalities have their own charters modifying the scope of the municipalities' authority.

[The Planning Act](#) states that municipalities must adopt a development plan by bylaw and that all secondary plans and development within the municipality must be consistent with that development plan, and further that all development proposals be consistent with appropriate secondary plans while also being broadly consistent with all provincial land use policies. Two or more municipalities may establish a planning district. These municipalities then need to ensure compliance of their plans with the planning district's. This act also states that plans must set out the objectives for a municipality respecting "its physical, social, environmental and economic objectives".

Manitoba enacted the [Manitoba Energy Code for Buildings](#) (Regulation 213/2013) (MECB).

Based on the *National Energy Code for Buildings*, with amendments, this addresses new efficiency standards for “building envelope, lighting, heating, ventilation, air-conditioning, water heating, and electrical systems and, as per MECB Article 1.1.1.1, will apply to construction of new buildings” and certain renovations or retrofits.

Broadly, all municipal plans must conform to the [Made in Manitoba Climate and Green Plan](#), in conjunction with [The Climate and Green Plan Act](#) which includes provisions for diverse environmental goals which impact municipalities. This plan also established the Made-In-Manitoba Climate and Green fund, which municipalities and some organizations may access. [The Manitoba Green Building Program](#) for all new projects and major retrofits for large developments significantly funded by the province to meet or exceed LEED Silver, assisted with a suite of forms and manuals. This program may have been transitioned to the new Efficiency Manitoba organisation.

SECTION 2: JURISDICTIONAL EXAMPLES OF SUSTAINABLE DESIGN POLICIES

[Efficiency Manitoba](#) is a new crown corporation in Manitoba with the goal of energy conservation. It has the [New Building Program 2.2](#) and [New Home Program](#) which offer incentives and support for improved efficiency in new builds; participants can take a prescriptive or performance path to meet criteria.

Winnipeg

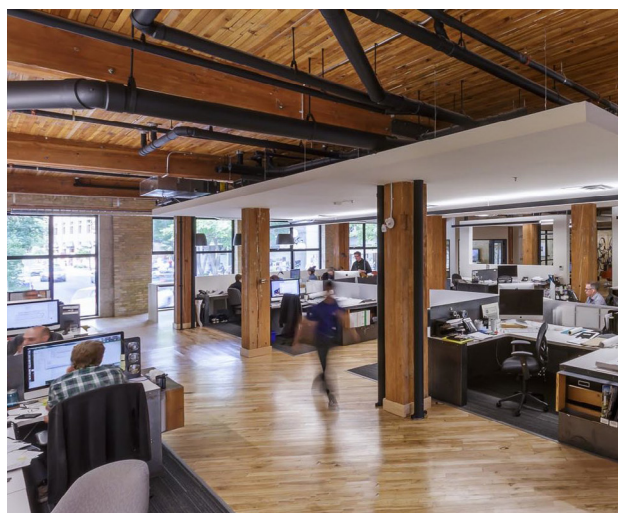
Winnipeg follows the MECB, and provides guidance to builders both independent of, and in conjunction with, the Provincial program. City development is guided by the forthcoming [OurWinnipeg 2045](#) plan, with six broad sustainability pillars. The *Complete Communities 2.0* direction strategy document functions as a secondary plan for the City. The City's development plan must also align with the forthcoming capital region plan under development by the Winnipeg Metropolitan Region.

Currently the City has no requirements beyond the building code for energy efficiency for new residential development, but is committed to its [Green Building Policy](#) for large (>500m²) newly constructed and major additions to city facilities (an essentially duplicate policy to a similarly named Provincial program), requires LEED silver or equivalent certification. There are no mandatory additional standards, but there is a [Building Energy Disclosure Project](#) for some types of commercial and institutional buildings (typically >50,000ft²); voluntary, some e-tools provided (103 currently registered, primarily municipal and provincial buildings).

SECTION 3: CASE STUDIES OF HIGH PERFORMANCE DESIGN

Prairie Architects Office Renovation

[Prairie Architects](#) is a Winnipeg-based architecture firm with a long history of advancing sustainability in their practice earning significant recognition, including several CaGBC awards. When renovating their own offices, they aimed to push the envelope in what was possible in a heritage warehouse conversion. It received LEED Platinum (Commercial Interiors v4) status. It consumes 31% less energy off baseline and 43% less potable water consumption / waste. In addition 84% of construction waste was diverted from the landfill, some of it being repurposed into new furniture for the office.



Caption: Prairie Architects Office

Old Grace Housing Co-op

The [Old Grace Housing Co-op](#) is an inter-generational, mixed income, environmentally sustainable co-operative housing project located in the heart of Winnipeg's Wolseley neighbourhood. Developed from the ground up to be an accessible asset for the community, it features a range of unit sizes, large, sunlit commons and lounge areas and exterior plaza and courtyard, all of which are fully wheelchair accessible. To replace a nesting site lost when the site was prepared, chimney swift habitat was constructed as well. It has received LEED Silver (LEED Canada for New Construction and Major Renovations 2009), MB Hydro New Building Program 2.0 Performance Path and Energy Modeling Support (Phase 1), MB Hydro New Homes Program certification – Performance Path Designation (Phase 2), achieving energy efficiency improvements over reference of 22.7% and 23.5% over reference.



Caption: The Old Grace Housing Co-op

Completed by:





REGIONAL GREEN DEVELOPMENT STANDARDS: PRINCE EDWARD ISLAND

INTRODUCTION:

Prince Edward Island (PEI) follows both the National Building Code (2015) and the [National Energy code of Canada for Buildings](#) (2017). Before provincially adopting the National Building Code (passed in spring of 2017, [officially rolled out in 2020](#)), only three municipalities in PEI had by-laws which required these standards be met, including Charlottetown, Summerside, and Stratford. However, there are no regional or municipal examples of green development standards in this region of Canada.

SECTION 1: PROVINCIAL LEGISLATION GOVERNING PLANNING AND MUNICIPAL AUTHORITY

The main pieces of legislation that relate to a municipality's ability to require sustainable new development and municipal policies for planning and development include the Building Code Act and Regulations, the Municipal Government Act, and the Planning Act.

Municipal Government Act

While the [Municipal Government Act](#) in PEI outlines the process for how a municipality is established, restructured, form a council, and create by-laws, it does not identify any authority relating to sustainable new development.

Planning Act

The [PEI Planning Act](#) outlines the authority of municipalities and the Province to create plans and by-laws, although little is identified in terms of a municipality's authority around buildings and development. However, Section 8(1)(f) states that *the Lieutenant Governor in Council may make provincial planning regulations applicable to any area except a municipality with an official plan and bylaws... with respect to building standards in particular (i) repealed 2017, (ii) establishing standards for the prevention and suppression of fires, (iii) establishing and prescribing architectural control standards* (from Part II – Provincial Planning).

Building Code Act

The [Prince Edward Island Building Codes Act](#) was passed in the spring of 2017. This is the main piece of legislation that gives municipalities in PEI authority to create bylaws for building standards that are more stringent than the provincial building code.

The authority given to municipalities in this Act include Section 4(2): *Subject to subsection (3), a council of a municipality shall be responsible for the administration and enforcement of this Act in the Municipality*, where subsection (3) states *A council of a municipality and the Minister may enter into an agreement providing for the Administration and enforcement of this Act in the municipality and by the Minister, and in that case, the Minister shall be responsible for the administration and enforcement of this Act in the municipality.* The authority of municipal councils to create by-laws in relation to this Act is set out in Section 26. A council of a municipality may make by-laws that are (a) not inconsistent with this Act and regulations; and

(b) where the by-laws impose a standard that varies from a standard set out in this Act or the regulations, not less stringent than the standard set out in the Act or the regulation.

Additionally, section 26 (3) states that a council of a municipality, may by bylaw, (b) prescribe standards for construction and demolition work in the municipality (i) that relate to matters not provided for in a code adopted under this act, or (ii) that are more stringent than the technical requirements set out in the code.

Building Code Act Regulations

It is within these regulations that PEI adopted both the [National Building Code](#) (2015) as well as the National Energy Code of Canada for Buildings (2017). However, these regulations give no further direction for the authority given to municipalities.

SECTION 2: JURISDICTIONAL EXAMPLES OF SUSTAINABLE DESIGN POLICIES

Currently there are no examples of municipal or regional Green Building Standards in PEI. PEI began to enforce the most recent National Building Code province-wide in early 2020.

Before this, only three municipalities had adopted the National Building Code through their own building by-laws (City of Charlottetown, City of Summerside, and Town of Stratford). Both the [City of Summerside Building Bylaw](#) and the [Town of Stratford Building Bylaw](#) adopted the 2010 edition of the National Building Code, while the Charlottetown Building Code Bylaw adopted the 2015 edition of the National building Code. Section 1.1.2.1(2) of the Charlottetown Bylaw also states *if and when the Government of Prince Edward Island adopts and mandates a Province-wide Building Code Act and Regulations, this by-law will be repealed in whole or in part.*

While no formal or enforceable standards above the National Building Code currently exist in PEI, the Town of Stratford has a Bylaw ([Zoning and Development Bylaw #45](#)) which outlines a sustainable subdivision overlay zone that can be applied to by subdivision developers. This is outlined in Section 5 of the Bylaw. The overlay zone is an approval and performance-based scoring mechanism to encourage more holistic site design and development standards.

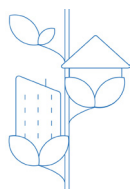
Indicators and evaluation criteria are broken out into 4 main areas, which include:

- » **1.** Natural Environment Consideration.
- » **2.** Social and Cultural Amenities.
- » **3.** Building Efficiency and Renewable Energy.
- » **4.** The Built Environment.

A more detailed scoring table can be found in Appendix B of this Bylaw. Based on the points awarded for this scoring system, developers can apply to receive one of three designations: Certified Sustainable Subdivision (65% of available points); Gold Sustainable Subdivision (75% of available points); and Platinum Sustainable Subdivision (85% of available points).

Completed by:





REGIONAL GREEN DEVELOPMENT STANDARDS: NEWFOUNDLAND AND LABRADOR

INTRODUCTION:

In recent years the Provincial government has worked with industry to accelerate sustainable building practices in the public sector. This includes [Build Better Buildings](#), which is a sustainable buildings policy for government funded projects. These initiatives include an emphasis on striving for LEED Silver in provincially funded buildings and renovations. The provincial government has also developed technical guides on constructing energy efficient homes, small buildings, and larger commercial buildings, and has delivered in-person and webinar training to over 230 construction industry professionals. Despite this, there are currently no regional or municipal green building standards in Newfoundland and Labrador.

SECTION 1: PROVINCIAL LEGISLATION GOVERNING PLANNING AND MUNICIPAL AUTHORITY

Municipalities Act

The [Newfoundland and Labrador Municipalities Act](#) states how a municipal unit may be created and operated. It indicates some areas of power, but very little is outlined in terms of building development. Section 194 states that a person shall not, within a municipality, erect a building except in accordance with a written permit from the council (which is outlined in section 407). Section 414 of this Act outlines regulations that a council shall make, including subsection (1) (d) *controlling and respecting the design, construction, alteration, reconstruction... and maintenance of buildings*. Outside of those clauses, there is nothing that explicitly grants a municipality the authority to enforce more stringent standards than those adopted by the province.

Urban and Rural Planning Act

The [Urban and Rural Planning Act](#) is the enabling legislation which:

- » Establishes the province's land use planning system;
- » Allows the preparation of a range of planning documents;
- » Provides for their approval and implementation; and
- » Provides for public input and an appeal process whereby development decisions can be subject to [independent review](#).

Section 10 of this Act outlines the process of proposing and developing a municipal plan, and section 11 outlines the identification of a municipal planning area. Once a council proposes to prepare a municipal plan in accordance with this Act, and a municipal planning area has been established, the council shall proceed with the development of a municipal plan and development regulations. Section 13(2) states everything this plan should include, and subsection (3) states things that a plan may include.

Under subsection 3, a plan may, with respect to a planning area, provide for the use and conservation of energy.

Section 29 outlines the ability for the regional authority responsible for the plan and development regulations to adopt a development scheme. A development scheme prepared and adopted under this section may specify the manner in which a particular area of land is to be developed and regulated, or prohibit the construction of buildings that would interfere with the carrying out of the development scheme.

Municipal or regional development regulations must conform to the Ministerial development regulations (section 36).

This section states the regulations that a Minister can make that shall be included the development regulations of councils and regional authorities. These regulations may include control of the design, appearance, and maintenance of buildings, land, and development.

With respect to conflicts with other legislation, Section 111 states that *the powers conferred upon a council or regional authority under this Act shall be in addition to powers conferred upon them under another act, unless there is a conflict with another Act, in which case this Act will prevail.*

Again, there does not seem to be anything in this act that states municipal authority to require more stringent building standards than the provincial building code.

Development Regulations (Newfoundland and Labrador Regulation 3/01 – Ministerial Regulations)

The [Development Regulations](#) developed under the Urban and Rural Planning Act do not contain any additional information around municipal authority in this area.

Fire Protection Services Regulations (Newfoundland and Labrador Regulation 45/12)

These regulations are made under the [Fire Protection Services Act](#) and outline the adoption of codes. Part 1, section 3(1) states the codes that are adopted, including (a) for the construction of all buildings (i) the National Building Code of Canada, 2010 edition. However, this is the only clause in the regulations that refer to the construction of buildings and development standards, as the majority of this legislation is focused on Fire Protection and Safety.

SECTION 2: JURISDICTIONAL EXAMPLES OF SUSTAINABLE DESIGN POLICIES

There are currently no examples of municipal or regional green development standards in Newfoundland and Labrador.

SECTION 3: CASE STUDIES OF HIGH-PERFORMANCE DESIGN

Corner Brook City Hall – LEED Silver

The City of Corner Brook has constructed a [\\$20-million facility](#) that has achieved LEED Silver under the international green building rating system (certified by the Canada Green Building Council). The building features a green roof, low E windows, sunshades and cladding for passive cooling, an energy management system, geothermal heating, water conservation measures, and the use of low emitting materials in the construction. The City has also lowered vehicle emissions through the addition of two hybrid vehicles. The City Hall is the first commercial office building in Newfoundland and Labrador to be [LEED Silver certified](#).



Caption: Corner Brook City Hall

Completed by:

Clean
Inspiring Environmental Change



REGIONAL GREEN DEVELOPMENT STANDARDS: NOVA SCOTIA

INTRODUCTION:

There are currently no regional green building standards in Nova Scotia. Within the last 3-5 years municipalities have become much more engaged in acting on climate change and identifying emission sources in their jurisdiction. Buildings are a big priority for many communities; however, current building code regulations do not permit municipalities to enforce a building standard that is more stringent than the provincial building code without approval from the Minister.

SECTION 1: PROVINCIAL LEGISLATION GOVERNING PLANNING AND MUNICIPAL AUTHORITY

There are two main pieces of legislation that are related to a municipality's ability to require sustainable new development and municipal policies for planning and development.

These are the Municipal Government Act (MGA) as well as the Nova Scotia Building Codes Act.

Municipal Government Act

The [Municipal Government Act](#) in Nova Scotia governs municipal operations in the province, including the creation of by-laws as well as planning and development, and gives broad authority to councils to enhance their ability to respond to present and future issues in their municipality.

Section 171(2) of this Act states that a by-law shall not be inconsistent with an enactment of the Province or of Canada. However, section 172(1) states that a council may make by-laws, for municipal purposes, respecting (ja) the condition or maintenance of vacant buildings, structures, and properties and, without restricting the generality of the foregoing, may (i) adopt property maintenance and performance standards.

Building Code Act

There are two sections of the Nova Scotia [Building Code Act](#) which provide direction to municipalities on their authority for passing bylaws regarding building standards: Section 5 (Administration and enforcement of Act in municipality), and Section 7 (Municipal By-laws). Section 5(1) states that the council of a municipality is responsible for the enforcement of this act in the municipality, and Section 7(1) states that a council of the municipality may pass by-laws not inconsistent with the Building Code Act.

There may be one section of the code which could allow municipalities to prescribe more stringent standards according to condition 4.2 of the Building Code Act. This condition states that *upon the recommendation of the council of a municipality, the Minister may by regulation, prescribe additional standards applicable to the construction or demolition where such standards are more stringent than the standards in the building code or relate to matters not regulated by the building code*. While this may allow a municipality to implement more stringent standards, the authority to prescribe these standards still lies with the Province.

Overall, there is currently no legislation in Nova Scotia that explicitly permits a municipality to have control over enforcing sustainable development standards that are more stringent than the provincial building code.

SECTION 2: JURISDICTIONAL EXAMPLES OF SUSTAINABLE DESIGN POLICIES

There are currently no examples of municipal or regional green building standards in Nova Scotia. However, many municipalities have adopted PACE bylaws, allowing them to provide financing to homeowners who wish to complete energy efficiency and renewable energy retrofits.

SECTION 3: CASE STUDIES OF HIGH PERFORMANCE DESIGN

Municipality of Argyle – Net Zero Administration Building

The Municipality of Argyle is in the process of constructing a new [Administration building](#) that will be the first Net Zero Administration building in Canada.

The building will incorporate high-efficiency measures like enhanced envelope insulation, efficiency-optimized building layout, low flow water fixtures, natural stormwater management measures, and [solar panels to generate electricity](#). The heating system was originally designed as a geothermal heat pump but has been redesigned as an [air source heat pump due to affordability](#). This project received significant funding in the form of grants and loans from the Federation of Canadian Municipalities.

Bentley Built Homes – Benjamin Grove (Rental Subdivision)

[Benjamin Grove](#) is a subdivision in the Annapolis Valley. There are currently 6 buildings, each of them 4 units, and there are plans to develop 7 more buildings making a total of 54 units.

The homes in this community are constructed with:

- » R-90 ceilings.
- » R-50 double stud above grade walls.
- » R-25 Frost walls.
- » R-50 under slab insulation.
- » Triple pane windows.
- » Mini-split heat pumps.
- » Electric Domestic Hot Water.
- » Air changes (ACH@50) of 1.45.



Caption: Bentley Built Homes. Retrieved from <https://bentleybuilt.ca/community-projects/benjamin-grove-rentals>

Completed by:





REGIONAL GREEN DEVELOPMENT STANDARDS: NEW BRUNSWICK

INTRODUCTION:

Currently there are no municipal or regional building standards in New Brunswick that go above and beyond what the National Building Code prescribes, standards that the Province have adopted. However, there is legislation enacted that does appear to provide more authority to local governments that wish to establish by-laws enforcing alternative standards to the building code adopted by the province, provided that the construction is also in compliance with the provincial building code.

SECTION 1: PROVINCIAL LEGISLATION GOVERNING PLANNING AND MUNICIPAL AUTHORITY

There are several pieces of legislation in New Brunswick that govern planning and municipal authority, including the Community Planning Act and Regulations, the Local Governance Act, the Building

Code Act, and a recently adopted Building Code Administration Act.

Community Planning Act

The [Community Planning Act](#), which was enacted on January 1, 2018 was designed to:

- » Enable the development of, and changes to be made to, planning documents and tools;
- » Outline the process that must be followed in order to create and adopt new by-laws and regulations; and
- » Provide authority to individuals or organizations or committees to carry out specific actions related to [land use planning and development](#).

There is nothing in this act that explicitly grants permission or authority to a municipality to enforce a building code that is more stringent than that adopted by the province. However, Section 53(2)vi states that a zoning by-law may regulate the design, character, and appearance of buildings.

Local Governance Act

The [Local Governance Act](#) came into force on January 1, 2018 and serves as a replacement for the former Municipalities Act. Similar to the Community Planning Act, this piece of legislation does not explicitly grant authority to municipalities to create/enforce their own development standard, but it does provide some guidance into their ability to create by-laws and how to go about doing so.

New Brunswick Building Code Act

Adopted in 2009, the [New Brunswick Building Code Act](#) states in Section 6(2)(p) that a municipal council or rural community council may, by building by-law, prescribe standards for construction and demolition work (i) that relate to matters not provided for in the Code, (ii) that are more stringent than the technical requirements set out in the code. Section 5 of this act also states that if a conflict exists between this Act or regulations, another Act or regulations, or a by-law enacted by a municipal council or rural community council, the provision under this Act prevails.

Building Code Administration Act

The [Building Code Administration Act](#) was introduced in March of 2020 and was enacted to allow the adoption of the latest version of the National Building Code, and the [National Energy Code for Buildings](#). This Act also provides similar direction to municipal authority as the Building Code Act.

Section 4(1) of the Act states that *no person shall construct a building unless the construction work conforms with the Code, as well as standards prescribed by a building by-law of the local government in which the building is to be constructed*. Section 5(1) states that *a council of a local government may make a building by-law to prescribe standards for the building ... repairing or replacing, or any combination of the work, of a building*.

SECTION 2: JURISDICTIONAL EXAMPLES OF SUSTAINABLE DESIGN POLICIES

Municipalities in New Brunswick follow the Building Code adopted by the Province (currently the 2010 National Building Code of Canada, though the 2015 version is expected to roll out in 2021). QUEST Canada recently worked with several municipalities in the province and based on this work they believe there are no municipalities in New Brunswick with standards in place that are more environmentally stringent than the provincial regulations¹. That said, some Municipal Plans encourage more efficient design/operation and are integrating local renewables (as part of municipal facilities and new developments), while some municipal zoning by-laws have provisions / exceptions / restrictions related to green energy (these vary by community, and many don't have any provisions). A Green Zoning By-Law was adopted recently by the City of Saint John, expressly enabling renewable energy development.

1 Personal Communication: Eddie Oldfield, QUEST (20/08/20)

SECTION 3: CASE STUDIES OF HIGH-PERFORMANCE DESIGN

As there are no regional building codes that prescribe this work, the following case studies were done on the initiative of the developers and builders.

Dobson Landing (Builders: Progeny Modern Homes & Wesco Construction)

[Dobson Landing](#) is a Smart community in Riverview New Brunswick. Dobson Landing combines smart energy technology and innovative energy efficiency elements to create a first of its kind concept community in Atlantic Canada. Currently under construction, the community will consist of 260 units (mix of single-family homes, condominiums, three multi-unit residential buildings, and retail spaces). All the buildings will use at least 50% less energy than a home built to minimum code standards and will be smart energy accessory and net-zero ready. They will include R36 wall insulation, triple-glazed windows, air source heat pumps, and smart energy controls. They will also be solar panel ready.

The initiative includes a pilot project with NB Power – residents will be able to lease solar panels and equipment from NB Power, and the company will also install a [free smart-home storage battery](#).

First Net Zero Home in New Brunswick

The house is the province's [first net zero home](#) to be certified by both the federal government and the Canadian Home Builders' Association. Components of the home include insulated concrete walls, triple glazed windows, 44 solar panels and a backup [rechargeable battery system](#).

Since it was built, the home has yet to sell due to the higher purchase price, and appraisers unable to determine the value of these types of components (i.e. the appraised value doesn't consider the additional energy efficiency measures and the cost savings that go along with that). The initial price tag was about 15% higher than [nearby comparables](#).



Caption: High Performance Design. Top Photo retrieved from <https://maketheswitch.ca/the-new-brunswick-home>

Bottom Photo retrieved from <https://www.cbc.ca/news/canada/new-brunswick/quispamsis-net-zero-home-1.4180573>

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