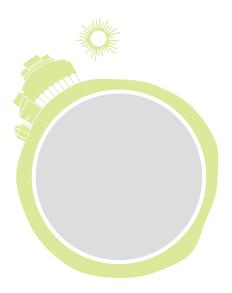




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IMAGE PLACEHOLDER





Message from the Mayor

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IMAGE PLACEHOLDER





Acknowledgements

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Leading the way together to livable neighbourhoods, healthy people and continuing prosperity



Environmental Health
Social & Cultural Well-Being
Economic Vitality



CHAPTER 1



Introduction

The Greenprint, Markham's Sustainability Plan, is a long-term plan to address environmental health, economic vitality, social well-being and cultural vibrancy, ensuring the full participation of all citizens in the economic, social and political life of the community. The Greenprint is a community-driven, comprehensive strategy, using a 50 to 100-year time frame, to make Markham one of the most livable and sustainable places in North America. Built on a framework of vision, priorities, strategies, and indicators, the Greenprint will help prepare Markham for future challenges, both locally and globally, and ensure Markham continues to be a great place to live, work and play. As decisions are made about the future, it is important that a high quality of life continues to be a priority and that Markham becomes a complete, connected community where all residents can be well and thrive.

As Canada's most diverse community, Markham represents a world's worth of knowledge and capacity to seize local challenges and capitalize on opportunities. Highlighting those opportunities and challenges related to community health, transportation, safe, accessible spaces, educational opportunities, equity and skills development, helps inform future planning. The focus of that planning will be to ensure that all citizens can contribute fully in order to sustain the community and meet their needs, and that a systems-thinking approach is used to ensure a holistic approach, where integration and interrelationships are recognized and encouraged.



Issues Facing Markham

Markham, like the rest of the world, is at a crossroads. A series of interrelated, complex problems, including climate change, will impact the well-being of our community for generations to come. Climate change alone will threaten the health and safety of hundreds of millions of people around the world. Access to clean water and sufficient food will be at risk, and a great many will suffer from habitat loss, coastal flooding, and economic deprivation. The United Kingdom's Stern Review estimates that without action the overall costs and risks of climate change will be equivalent to losing at least 5% of global GDP each year, now and forever. If a wider range of risks and impacts are taken into account, the estimates of damage could rise to 20% or more of global GDP.

As Markham evolves within this global context, it will experience increasing pressures related to transportation, infrastructure, social equity, inclusiveness, and land and food resources. As the community grows and transitions, now is the time to consider what schools and jobs will attract and retain residents, how residents, employees and visitors will travel within the community and beyond, how the community will be fed, what kind of services and housing will be needed, and what gathering places people will seek. Residents will seek, and expect, accessible and appropriate open spaces, recreation, amenities, services, entertainment and opportunities for lifelong learning. Now is the time to plan for the emerging conditions Markham residents seek.

The reasons people have historically come to Markham, such as clean air, green spaces, safe neighbourhoods and good jobs, must remain desirable in the future. And as it grows, the diverse communities and people who choose to live in Markham, for the cultural heritage, the natural environment and many quality employers, will benefit from social, cultural, economic and environmental assets within the community - assets that will support the community as it evolves. Markham's main goal going forward is to be flexible, resilient, and adaptable to ensure that today's assets that contribute to a high quality of life for Markham's residents are sustained and enhanced over time. Markham will be successful as it meets future challenges.



Thinking Long-Term About Markham

The Greenprint, Markham's Sustainability Plan, is a community-driven strategy with a 50 to 100-year time frame that invites and encourages resident participation and engagement to ensure long-term well-being and prosperity. The Greenprint vision is:

Markham: leading the way together to livable neighbourhoods, healthy people and continuing prosperity

The vision is supported by the following guiding framework:

In a sustainable Markham

- We rely on materials, goods and services that are created, harvested and processed in keeping with natural cycles we do not dig things up too fast
- We rely on materials, goods and services that break down easily in nature, are used up by nature and are abundant in nature we do not produce waste
- We value and restore the natural environment and protect biodiversity, natural capital and ecosystem services, and
- We meet people's needs





The Greenprint will build on other municipal initiatives, such as the Diversity Action Plan, the Integrated Leisure Master Plan, the Growth Management Strategy, the Vision 2020 Economic Development Strategy, and policies, guidelines and processes underway, to become a comprehensive, integrated framework that guides the Town, over time, to the desired sustainable future. The Greenprint will also build on current partnerships and help create new partnerships. In addition, the Markham Greenprint will meet the criteria of the Federal Gas Tax Agreement to complete a community sustainability plan and will further the Town's participation in the Partners for Climate Protection initiative.

Strategies for action in the Greenprint use a systems-thinking approach to lay the foundation for an integrated, healthy, efficient and socially inclusive community that reflects the sustainability priorities.



How You Will Benefit From the Greenprint

The Greenprint is a call to action for citizens to work together to leverage local and global changes as opportunities to create a community that will thrive. Citizens will also be called upon to collaborate to overcome the physical, social and institutional barriers which often limit people's choices and to make a commitment to a healthy, efficient and sustainable community.

The Greenprint envisions a community in which residents have the right to accessible streets, open spaces, festivals, squares, buildings and public transport systems, regardless of their age, ability, gender, income level, language, ethnic, cultural or religious background, thus strengthening the freedom and autonomy of all residents, and contributing to social inclusion, solidarity and democracy. Markham residents will be able to live in a healthy, convenient and attractive environment that meets their needs, and freely enjoy the amenities of flexible public areas in comfort and safety.

The Greenprint, Markham's Sustainability Plan, is intended for individuals and organizations within Markham as well as for other communities and organizations. The pages and chapters that follow will outline the priorities and strategies recommended to bring Markham closer to sustainability. It is hoped that the community's residents, stakeholders and businesses will use the Greenprint and the associated website www.markham/sustainability to learn about and contribute to Markham's desired future, vision and sustainability objectives, as well as how to achieve the vision. The Greenprint also outlines questions that can be asked to help align actions, both personal and professional, with the community's vision of success and sustainability. The Greenprint will be an evolution. Please plan to be part of the journey to a sustainable community.

Questions or comments:

Please contact the Sustainability Office, Town of Markham

101 Town Centre Blvd Markham ON L3R 4J3 905-477-7000 Email: sustainability@markham.ca

www.markham.ca/sustainability

Follow us on Twitter at: Somarkham

Join our Facebook group: Markham Greenprint





Markham's Global Context

This plan considers a number of long-term forces of change that are anticipated to influence Markham's long-term well-being. The following is a brief overview of the most critical issues to which the Greenprint Sustainability Plan responds.





2.1 Ecological Health

Protecting, enhancing and restoring the biodiversity in Markham includes maintaining and restoring the health of parks, open spaces, valley lands and aquatic ecosystems, remnant natural areas (meadows, woodlands), and site-specific features for species at risk protection. Markham's Natural Heritage Network and Greenway System provides the framework and guidance on biodiversity protection over time.

2.2 Climate Change

Increasing concentrations of carbon dioxide and other greenhouse gases (GHGs) from human activity are causing the earth to warm rapidly. A 2007 Assessment Report by the United Nations Intergovernmental Panel on Climate Change (IPCC) found that global weather patterns have become more extreme, with more frequent and more intense rainfall events, more intense heat waves and prolonged droughts. Markham, expected to experience wetter summers and greater snowfalls, will be vulnerable to these changes. For instance, Markham's extensive infrastructure network, essential to support dense population centres and intense economic activity, has not been designed nor constructed to adapt to and accommodate these climatic changes.

2.3 Energy

Fossil fuel combustion is a significant source of GHGs and the primary source of Markham's energy. Many energy experts note that we have already experienced a North American peak in natural gas production, and by 2040 are expecting a global peak in oil production.³ The "peak" refers to the point at which humans have consumed the most accessible, known fossil fuel reserves. This is considered the turning point in which production will go into irreversible decline leading to oil shortages and higher prices. To respond to climate change and concerns about fossil fuel supplies, Ontario's Green Energy Act was enacted to position the Province as a major generator of renewable energy by making it easier and profitable to develop green energy projects. Markham is positioning itself to be a leader in conservation and renewable energy through innovative projects such as the Markham District Energy, numerous solar energy initiatives, and emerging green building policies.

^{1.} IPCC. Climate Change 2007 - The Physical Science Basis (Contribution of Working Group I to the Fourth Assessment Report of the IPCC)

Cambridge University Press, Cambridge, 2007. Web.

Cambridge University Press, Cambridge, 2007. Web.

2. Chiotti, Quentin, and Beth Lavender. From Impacts to Adaptation: Canada in a Changing Climate – Chapter 6 (Ontario). Natural Resources Canada, 2007. Print.

3. United States Government Accountability Office, Report to Congressional Requesters, CRUDE OIL: Uncertainty about Future Oil Supply Makes It Important to Develop a Strategy for Addressing a Peak and Decline in Oil Production, 2007. Web.

2.4 Water

Urban development increases demand for potable water, results in more sanitary sewage water that needs treatment and increases potential for contaminated stormwater runoff, affecting watersheds both in and outside Markham. Markham depends on York Region and the City of Toronto for potable water that comes from the Great Lakes. Reducing water and treatment demand from new and existing development is critical to ensure a long-term water supply and to ensure that local streams supply clean and healthy water to the Town's main water source.

2.5 Resource Management

Material and resource use have far-reaching environmental impacts, both "upstream" in the extraction and processing of resources to produce manufactured goods, and "downstream" in the pollution from waste disposal and groundwater contamination. Many of these impacts are felt beyond Town boundaries. Though Markham is a leader in managing solid waste (over 70% of residential waste is diverted from landfills), Canada has yet to curb consumption of goods that produce excessive waste. Landfill and waste management costs, coupled with decreasing public support for new landfills and alternative forms of waste management, are forcing government to reconsider goods-packaging standards and consider implementing producer-responsibility legislation such as mandatory bottle recycling.

2.6 Food Security

During the last century, the world saw a transition from locally grown and processed food to an industrialized model that uses modified seeds and massive quantities of oil to produce chemical fertilizers, operate industrial machinery and transport food from every corner of the planet. A recent study found that a small bag of fruit, vegetables and meat purchased in Toronto travelled an average of 5,800 miles to get to consumers.⁴ Markham's neighbourhoods, farms and farmers' markets can contribute to local food security, provide choices and reduce the reliance on resource-intensive foods.

2.7 Population Growth & Housing

People have come to Markham in search of employment, for the sake of their children's future, to unify their families, as refugees fleeing war, social disruption and religious and other forms of persecution. That already complex picture is likely to become significantly more complex in the future. Traditional immigrants may be joined by "climate refugees," people displaced by disasters caused by changing climate. Some estimates suggest that as many as 150 million people may be forced from their homes as a result of a number of factors, including climate change, by 2050.⁵

^{4.} Bentley, Stephen, and Ravenna Barker. "Fighting Global Warming at the Farmer's Market: The Role of Local Food Systems In Reducing Greenhouse Gas Emissions." 2005. Web. 17 Feb 2010. www.foodshare.net. 5. Myers, N., J. Kent. "Environmental exodus: an emergent crisis in the global arena", Washington, DC: The Climate Institute, 1995. Web.

Markham is not only Canada's most diverse community, it is also one of its fastest growing municipalities. Identified in Ontario's "Places to Grow" legislation as a major growth area in the GTA, Markham will need to demonstrate its strategy for accommodating the housing and employment needs of these newcomers. Addressing the housing needs of future residents will become increasingly important. A full range of housing choices and tenureship options (ownership, rental, cooperative, etc.) will be needed to respond to the shelter needs of a culturally and economically diverse community.

2.8 Equity and Human Health

By the mid 1990's, Ontario's income gap outpaced the Canadian average and continued to widen as the economy became stronger; it is now at an all-time high. Incomes for the top 10% of Ontario families rose by 40% between 1976 and 2004, while they fell by 60% for the bottom 10% of families. Evidence of this exists in Markham where child poverty rates rose to 20% in 2005 from 8% in 1990.⁷

In terms of physical health, diabetes, obesity, cancer and asthma are all on the rise across the country because of reduced physical activity and poor nutrition. Between 1981 and 2009, the percentage of overweight or obese boys rose from 14 to 31. Among girls, the increase was from 14% to 25%.8 Markham can create a community that enables healthy lifestyles and opportunities for healthier people. Markham Centre, a high-density, mixed-use community, will place services and jobs within close walking distance from a broad range of housing types. This approach to community design facilitates less spending on personal transportation (e.g. walking and transit is cheaper than car ownership), improves equity by providing a range of income opportunities and affordable housing types, and promotes better physical health because people are more likely to integrate activity, such as walking, into their daily lives.



^{6.} Armine Yalnizyan, Ontario's Growing Gap: Time for Leadership, Canadian Centre for Policy Alternatives.
7. Children's Aid Society of Toronto, "Greater Trouble in Greater Toronto: Child Poverty in the GTA". December, 2008. Web.
8. Statistics Canada. "Fitness of Canadian Children and Youth: Results from the 2007-2009 Canadian Health Measures Survey". 2009. Web.



2.9 Economy

Communities today are looking at dramatically and radically transforming economies. Global trade, new technologies, changing trade laws, emerging economic powerhouses and the restructuring of workforces regionally and internationally are difficult to understand at the global scale and even more challenging to determine how they play out at the local level. Markham has thrived and become a national leader in attracting significant job growth and business expansion and today stands as the "High Tech Capital of Canada".

The Greenprint is about ensuring that these challenges are considered in an integrated manner. The Greenprint proposes twelve sustainability priorities intended to be integrated into all aspects of community planning, development and operations. By adopting these sustainability priorities, Markham will be able to consider how it reallocates resources, seeking new focal points for intervention.





CHAPTER 3



Sustainability Priorities

The Greenprint Community Sustainability Plan identifies twelve priorities that respond to the global challenges (described in Chapter 2). Each priority describes an outcome or desired sustainability performance.



Overview of Markham's Sustainability Priorities



IMPLEMENTATION STRATEGIES

PLACE:

Create complete neighbourhoods as the foundation of a great community.

FUNCTION:

Create and maintain robust and resilient infrastructure.

PEOPLE:

Support continuing health and prosperity.

Markham's Sustainability Priorities

Social Equity: A Community Where All People Can Thrive

A socially equitable society is one in which citizens have equal opportunities and rights regardless of age, gender, culture, sexual orientation, religion, ethnicity, income, health and physical or mental ability. Social equity includes equal rights to security, the right to vote, freedom of speech and assembly, and equal access to education, housing, health care, recreation and other services. Some individuals and groups require increased levels of support. An equitable and caring community understands and responds to needs of vulnerable populations. This priority ensures that today's and tomorrow's citizens enjoy all that Markham offers as well as a high sense of belonging, despite age, gender, ethnicity, orientation, income, health, and physical and mental ability.

Identity and Culture: Unique Sense of Place, Culturally Vibrant & Inclusive

Markham has one of the most diverse populations in Canada, with over 65 cultures and languages. One of the Town's great strengths is that it is "a community of communities" where both diversity and harmonious interaction are celebrated. This priority will ensure that Markham's citizens celebrate aspects of the community that make it unique as well as the experiences that bring them together. The community's unique



natural setting and heritage are reflected and celebrated in all its various aspects.

Individual Health: A Community that Facilitates Wellness

Sustainable communities promote individual and community health and create opportunities for people to meet their physical, intellectual, emotional and spiritual needs. Strategies and priorities in the Greenprint support and promote active living and healthy lifestyle choices through partnerships with neighbourhood schools, community gardens, and social clubs, with an emphasis on neighbourhood connections. This priority will ensure that all citizens enjoy physical, mental and spiritual well-being in a community that promotes and is built to support healthy and active lifestyles.

Shelter: Housing Choice for All Residents

Appropriate and affordable housing ensures citizens can be productive and engaged in their community and the local economy. At a community scale, a diversity of housing types and tenure defines the quality and livability of neighbourhoods and the quality of life for residents. Also, to ensure a stable workforce and market for goods and services, businesses depend on housing that has access to jobs, mobility options, recreation, schools, open space, amenities and services. Local and regional governments play an important role in ensuring the provision of non-market housing through incentives, inclusionary zoning, partnerships, housing corporations and special programs. All levels of government and non-profit groups must work together to provide a range of housing options that meet the needs of the community. This priority will ensure a range of housing choices to accommodate the needs of all in all parts of Markham.

Food Security: Safe, Accessible & Healthy Local Food for All

Safe, accessible and healthy local food exists within a larger food system and includes production, processing, transportation, distribution, retail, consumption, celebration and nutrient recovery. A food system is sustainable if it is energy-efficient, protects ecosystems, enhances the local economy, and builds community. Sustainable food systems also build resilience into farming systems and communities, helping residents withstand pressures such as energy and food security crises and development pressure on farmland. This priority will ensure that all residents have access to appropriate, affordable, healthy food, including food that is produced locally.

Access and Mobility: Access, Connections & Safe Choices for All

Traditionally, transportation has been viewed as the movement of vehicles. Communities are now shifting their focus to moving people, not cars, and moving goods and services that support local businesses. Walking, cycling and transit are more affordable mobility options than car ownership, reduce emissions from fossil fuels, and daily activity such as walking and cycling positively affects individual health and social well-being. This priority will ensure that all Markham residents enjoy convenient, safe, enjoyable access to all modes of transportation that are connected and equitable for all system users.





Education and Skills: High-Performing & Empowered Citizens

A community thrives when its citizens have the ability to learn and develop skills, find meaningful jobs and are empowered to realize their full potential. In today's fast-paced and ever-changing world, all citizens require flexibility of skill and knowledge at all stages of life. Having high-performing and empowered citizens will allow Markham to develop, retain, and grow local talent and innovation. This priority will ensure that Markham's residents have access to appropriate and affordable lifelong learning opportunities, ensuring that skills and education match economic needs as well as meet the human need for creativity.

Vibrant Economy: Create a Community of Choice to Live, Work & Play

A local economy supports job creation through the retention and growth of existing businesses and through the attraction of new businesses and investment. Strong local economies include businesses that position themselves for the future by continuously improving. A vibrant economy is also a resilient one, supported by a diversity of business sizes and sectors. This priority will ensure that Markham has a vibrant, resilient and sustainable economy that is oriented to local and future opportunities.

Energy and Climate: Carbon Neutral, Responsible & Resilient

The majority of greenhouse gas emissions are from fossil fuels consumed in buildings and vehicles for transportation. Communities have significant control over local land use, transportation patterns, building energy use and solid waste disposal, all significant contributors to greenhouse gas emissions. Reducing greenhouse gas emissions through reducing fossil fuel consumption and adopting renewable energy is an appropriate climate change mitigation strategy. Designing communities for anticipated climatic variability will also add resilience in the system and provide a flexible platform for adaptation to changing conditions. This priority will ensure that Markham will be a net zero emissions community that is resilient in its response to anticipated and unexpected future climatic conditions.

Ecosystem Integrity: Protect, Restore, & Enhance Biodiversity & Habitat

Natural ecosystems offer habitat for plants and animals as well as for humans. Natural ecosystems offer significant 'services' in four main contributions to society that include:

- Supporting: Nutrient cycling, soil formation, primary production
- Provisioning: Food (crops, livestock, fisheries), fresh water, timber, fibre, fuel, air
- Regulating: Climate regulation, flood regulation, disease regulation, waste treatment, air and water purification, water retention and erosion control, hazard protection, carbon sequestration
- Cultural: Aesthetic, spiritual, recreational, educational

The ability of an ecosystem to function properly so as to support a range of species and to sustain natural functions rests mainly on the existence of larger natural areas and connections between them. Hubs and corridors offer sanctuary and mobility opportunities for animals and humans alike. This priority will ensure that Markham protects, restores and enhances natural spaces and the connections and processes that support them.





Materials Management: Facilitate a Closed-Loop Materials Management System

To produce the goods we consume, waste is generated in all stages of resource extraction, production, consumption and disposal. Product and technological innovations have reduced the energy and material intensity of many consumer goods. However, the increasing volume of goods that are used and discarded, with the increasing consumer demand, have outweighed many of these gains. Markham is already a leader in waste reduction and management. For the second consecutive year, the citizens of Markham have been recognized as the best recyclers in Canada, winning two prestigious Ontario Waste Minimization Awards from the Recycling Council of Ontario, the 2008 Sustainable Municipality Gold Award, and a Bronze Promotion Award for its portable EcoMedia bins. Markham has the highest residential waste diversion rate of any urban municipality in Canada. Markham has also made efforts to 'close the loop' of material consumption, through material reuse, with innovative practices such as asphalt reuse and requiring green building practices which can include recycled content for some rating programs. This priority will ensure that Markham produces zero waste and creates demand for recycled and reusable materials in all aspects of operational and policy initiatives.

Water Efficiency: Promote Conservation & Minimize Waste

Water management is influenced by how cities and buildings are designed, how infrastructure is designed and paid for, and by the decisions residents and businesses make about their water use. Integrated storm water management practices such as bioswales, permeable paving, reusing wastewater for irrigation purposes and the development of an integrated distributed water system that uses potable water for drinking/cleaning and non-potable water for other uses, are all opportunities in the Greenprint to promote water efficiency. This priority will ensure that Markham will promote conservation of water by reducing demand and promoting reuse.





Sustainability Framework for Action

The Greenprint Community Sustainability Plan is built on a framework of vision, priorities, strategies, goals and recommendations. It begins with a vision of a future sustainable Markham. This is the community's desired future state. The vision is informed by sustainability priorities, outlined in Chapter 3, that are necessary to achieve the community's desired sustainability performance. A set of strategies, which integrate Markham's sustainability priorities, frame a number of goals and recommended actions for moving from the current state to a sustainable future.



Elements of the Framework

Vision

Markham's desired future state, the vision for how Markham will look, feel and behave.

Sustainability Priorities

Markham's priorities for social and cultural well-being, economic vitality and environmental health that address community and stakeholder concerns for the long-term. Each priority is set in the context of global challenges and describes the sustainability "end-states" that Markham seeks to achieve to ensure a resilient and relevant future. Each priority is monitored and measured using indicators.

Strategies for a Sustainable Markham

The strategies take priorities that are globally minded and wrestle them down to the ground to local realities. The strategies are therefore tangible outcomes that are ground-and-frame goals and recommendations – recommendations that are even more detailed and clear about how the priorities play out locally.

Using the Framework

The Framework is a tool to be used when decisions are being made about projects. Every project should be assessed to determine whether it moves the community closer to its sustainability vision. Community builders can assess the merits of the project by comparing it against the sustainability priorities and strategies during project definition and development. The framework must be used as a guide when considering initiatives to ensure they provide maximum sustainability benefit.



CHAPTER 5



Markham's Sustainability Strategies

In response to Markham's vision, and the global forces of change, three strategies have been developed to move Markham toward becoming a more livable and sustainable place. The strategies focus on place, function, and people. They are as follows:

1. PLACE

Creating Complete Neighbourhoods as the Foundation of a Great Community

2. FUNCTION

Create and maintain robust and resilient infrastructure

3. PEOPLE
Support Continuing Health and Prosperity

Each strategy integrates positive outcomes for multiple Markham sustainability priorities. That is, rather than focusing on achieving one positive outcome, related to one sustainability priority, the strategies respond to many sustainability priorities to achieve multiple benefits for every investment made.



The Place Strategy is the foundation of the Function and People Strategies. It is a physical form of community that reduces reliance on energy and water while minimizing waste. Compact and complete neighbourhoods provide daily life needs within walking distance for residents, can be served by distributed energy systems, consume less land, support ecosystem services, and are transit-supportive, among other benefits. The physical form of complete neighbourhoods is adaptable and responsive to changing environmental, economic, and social circumstances.

The Function Strategy is built on the Place Strategy and serves the People Strategy. Function represents the infrastructure systems that support human and natural activities. Efficient infrastructure, (i.e. pipes and wires and the materials and information they convey), also reduces energy and water use while minimizing waste. High-performing buildings are less costly to operate and reduce demands on municipal infrastructure. Ecosystems services provide the community with clean air, water, and a source of food. Robust infrastructure services are resilient to the effects of climate change as they meet the needs of people.

Supporting the People Strategy is the ultimate end state desired through the Place and Function Strategies. Continuing health and prosperity are built upon complete neighbourhoods and resilient infrastructure services. Healthy people feel included and contribute to shaping their government, creating opportunities for rewarding employment, and perpetuate a culture of excellence. Fulfilled people are capable of adapting to changes in the world and shaping a bright future.

In the following sections the three strategies are described in more detail. Each strategy is accompanied by multiple goals, objectives and recommendations.



PLACE STRATEGY

Creating Complete Neighbourhoods as the Foundation of a Great Community



Strong and sustainable neighbourhoods are the foundation of Markham. They are the places where people of all means, abilities, beliefs and backgrounds come together to share a sense of belonging and neighbourliness. Neighbourhoods provide opportunities for people to learn about one another so as to create a common voice for engaging local government and maintaining a high quality of life. They are safe places where children feel comfortable exploring their world and all people feel comfortable freely expressing themselves. Neighbourhoods combine with other neighbourhoods to create a great community.

Strong and sustainable neighbourhoods meet all daily social, economic and environmental needs within walking distance of where people live. They form the base upon which all other aspects of the community are built. Neighbourhoods that are walkable reduce energy consumption, contribute to individual health, provide ecosystems services and are hubs for social interaction.

In a sustainable Markham, a neighbourhood includes the following physical elements:

- Many types of housing forms, including single detached homes, duplexes, townhouses, live/work units, and medium and high-rise apartments in densities that support transit service.
- Housing tenure diversity that includes ownership, rental, non-market affordable and supportive housing, promoting greater income and household diversity and allowing for aging in place.



- Accessible, inclusive, and appropriately scaled:
 - o Schools and other learning institutions
 - o Cultural and recreational amenities, including libraries, community centres, gathering places, parks, and trail and open space systems
 - o Places to access social services
 - o Places to work
 - o Food stores, small or large grocery stores and restaurants
 - o Local serving businesses such as retail stores and offices
 - o Places of worship
- Distributed energy facilities
- Connections to surrounding communities

GOAL 1:

Walkable, Accessible, and Inclusive Neighbourhoods Create Places that Bring People Together.

How this goal addresses our priorities:

- **Equity:** Families benefit from walkable and complete neighbourhoods because they can reduce the cost of living by reducing travel costs. If the daily needs are within short walking distances from home, seniors and the mobility-challenged have greater opportunity for convenient, low-cost and independent living.
- **Health:** Walkable, mixed-use neighbourhoods enable more active lifestyles and promote human interaction and expression.
- **Shelter:** Greater housing diversity (building typologies, affordability, etc.) creates more opportunities for affordable, rental and non-market housing and allows people of all means to interact.
- **Food:** Development intensification in existing urban areas reduces pressure on farmed land in non-developed portions of Markham and the region. Complete neighbourhoods also promote greater access to healthy food and grocery stores.

- **Mobility:** Intense development leads to more viable and frequent transit and greater mixed use will make walking more viable and desirable.
- **Ecosystems:** Development intensification will not decrease ecosystems in non-developed portions of Markham.
- **Energy:** Compact development will create emission reductions that result from greater transit use and walking/cycling. Similarly, higher-density housing is more energy efficient than single detached housing.
- Water: High-density communities create more opportunity for viable water reuse (eg. centrally collected wastewater can be treated and reused for irrigation in parks and/or landscaping).



OBJECTIVE:

Regenerate existing neighbourhoods through sensitive evolution.

- **Regeneration:** Create a department of regeneration focused on infrastructure modernization, public engagement, and socio-cultural aspects of neighbourhoods to respond to issues related to climate change and increasing energy costs.
- Geographically define Markham neighbourhoods within existing communities as follows:
 - o **Pedestrian-Oriented Redevelopment:** Focus regeneration on pedestrian needs.
 - o **Centre:** The heart of a neighbourhood. It contains a mixture of uses located on a neighbourhood "high-street," is approximately 2 blocks in length or no more than 250 metres, includes viable local-serving retail, varied housing choices, including low-rise apartments, access to services and community facilities, and rapid or frequent transit.
 - o **Extent:** The 15-minute walkshed, measured from the neighbourhood's centre, loosely defines the neighbourhood. This represents 1,200 walkable metres from the neighborhood centre (as opposed to a 1,200 metre radius) and should take into consideration barriers such as large and hostile streets, rail crossings, large format blocks, and natural features.
 - o **Structure:** The structure of a complete neighbourhood is defined by a well-connected street and trail network and appropriately sized blocks. Generally,

- the perimeter of a block should not exceed 450 metres or approximately a five-minute walk for a person travelling at 1.5 metres per second. Where finely grained blocks are not feasible, emphasis should be placed on creating pedestrian connections.
- o **Identity:** Define planning units within larger, existing communities by identifying new neighbourhoods. Develop high-quality public realm, including heritage preservation, as a means to identity the distinct neighbourhoods.
- o **Design:** Develop neighbourhood-appropriate urban design and architectural character guidelines that promote placemaking, and general Markham guidelines that promote built form focused on livability and walkability to support community development and gathering.
- Neighbourhoods Co-Creation Process: Use a co-creative and engagement communication model of neighbourhood planning for regenerating neighbourhoods. Work with and educate residents to create more complete neighbourhoods by identifying and creating new buildings, streetscapes, landscaping, and infrastructure measures that will reduce greenhouse gases, waste generation, and improved energy and water efficiency.
- Retrofit Neighbourhoods to Be More Resilient: Promote sensitive resiliency redevelopment in the following order of priority:
 - o **Live-work:** Promote live-work development adjacent and within neighbourhoods and along major roads.
 - o **Intensification Areas:** Strategically intensify underutilized areas such autooriented retail places, strip malls, large-format retail sites, and undeveloped sites in and around existing neighbourhoods to serve as neighbourhood centres and to increase residential densities to support transit.
 - o **Leverage Transit through Active Transportation Investments:** For areas within a 5-minute walk from existing or planned rapid transit stations, create compact, mixed-use and pedestrian-friendly neighbourhood centres.
 - o **Residential Intensification:** Promote sensitive redevelopment of existing housing to higher intensity-grade-related housing, semi-detached, town- or row-housing, and low-rise apartments.
 - o Focus on water, energy, and socio-cultural resiliency in the neighbourhood regeneration through the use of smart systems, monitoring, and communication.



OBJECTIVE:

Plan, design & construct high-performance new neighbourhoods.

- Intensive Mixed-Use Development: Prioritize intense mixed-use development for new neighbourhoods:
 - o **Pedestrian-Oriented Development:** Ensure residential densities and other uses support pedestrian-oriented activities and are transit-supportive at all scales.
 - o **Greater Mixed Use:** Pursue a more mixed-use model of community planning and design that integrates business, industry and residential development in one neighbourhood.
 - o **Open-Space Systems:** Integrate parks and open spaces, such as actively programmed parks and plazas that promote community gathering and physical activity for all users, with emphasis on families, youth and seniors.
- **Housing Choices:** Make full use of policy and regulatory tools and pursue partnerships and government funding to deliver housing tenure diversity, and non-market affordable and supportive housing options in large-scale redevelopment.
- **Energy Optimization:** Planning new neighbourhoods using appropriate modeling and analytical tools, including asset mapping, that demonstrate optimized neighbourhood design that delivers minimum energy consumption and greenhouse gas generation and responds to socio-cultural needs.
- **Social Capital:** As a condition of approval, new neighbourhoods should include a plan that identifies how social assets (galleries, recreation centres, libraries, parks, plazas, squares, etc., both public and private) will be made accessible to residents.
- **Soils:** Maintain the health and quality of soils throughout the development of new neighbourhoods and work with natural topography and hydrology.





GOAL 2:

Multi-Modal Transportation System: 40% of (combined) trips to work make use of transit, walking and cycling.

How this goal addresses our priorities:

- **Equity:** Transit, walking and cycling are more affordable mobility options than car ownership and usage, and therefore minimizes the negative impact of having a low income.
- Health: Re-introducing daily activity such as walking and cycling into daily lives
 positively affects individual health and reduces incidences of obesity and cardiovascular disease.
- **Mobility:** More investment in transit/active transportation infrastructure (including corresponding density increases) will reduce auto dependency while also creating significantly more choice for personal transportation.
- Climate Protection: 33% of Markham's GHG emissions come from transportation sources, mostly from personal vehicles. Shifting to low-impact modes of transport such as cycling, transit, and walking as the main modes of travel, reduces GHG emissions and therefore mitigates climate change.



OBJECTIVE:

Create a culture of walking, cycling and transit usage

- Pedestrian-Oriented Redevelopment: Focus on pedestrian needs as a priority.
- **Transportation-Demand Management:** Increase funding and seek partnerships to implement transit-demand management initiatives, including:
 - o **Support Pricing Policies:** Implement local and/or support regional pricing policies, such as toll roads and congestion fees that encourage transit use and active transportation.
 - o **Partnerships:** Partner with schools and employers to reduce automobile trips by implementing transportation-demand initiatives.
 - o **Car Sharing:** Promote the use of car sharing as a viable choice, offsetting vehicle ownership.
 - o **Active-Mode Priority:** Require that all new development be designed primarily for pedestrian and cycle circulation.
 - o **Efficiency:** Work with employers and other destinations to spread out peak use of roads.

- **Shift Spending & Planning Focus:** Shift spending and planning priorities to promote greater walking, cycling and transit use. This implies a shift in community planning and development to place a greater emphasis on optimizing land use and public-realm design to increase the viability of these modes.
- Integrated Routes & Facilities: Expand multi-modal network improvements by creating dedicated and integrated pedestrian and cycling routes that connect predominant housing areas to employment areas, amenities and institutions. Create transit opportunities for non-employment destinations such as entertainment precincts, tourist destinations and services. Integrate transit and cycling facilities by ensuring cycling network and bus route connectivity and installing bike lockers at stations and on-bus bike racks.
- **Transfer Facilities:** Integrate multi-modal transportation exchanges in neighbourhood centres, including bus stops, bicycle storage, share cars, and private vehicle and taxi parking.
- Accessible & Safe: Make walking, cycling and transit use safe, convenient and usable for all of Markham's residents, with emphasis on youth and children, people with disabilities, non-English-speaking-or-reading residents and low-income individuals.



- **Capacity:** Increase transportation system capacity through policies focused on creating network efficiency, increasing modal split, incentives for private sector transit operators, intelligent transportation technology, while not investing in road widening.
- Goods and Services: Focus on goods and services transportation, including rail modes.
- **Road Classification:** Create a simple Markham street classification system focused on three layers: neighbourhood, community, and region. Create standards that respond to these contexts and work with other levels of government to meet Markham's needs related to climate change resiliency and energy use.
- Active-Mode Priority: Implement measures that enable transit, cycling and pedestrian priority over single-occupancy vehicles on all major routes and intersections.

- **Safe Environments:** Implement design and land-use measures that maximize pedestrian and cyclist-friendly comfort on all streets.
- **Design:** Equitably design streets so that non-automobile modes are viable year-round, safe, comfortable, and efficient. Focus efforts on high-streets in regeneration areas.

GOAL 3:

Integrated Open-Space Network: Create a network of parks, trails and valleys lands that promote habitat and connectivity.

How this goal addresses our priorities:

- **Food:** Parks and open spaces in neighbourhoods provide ample opportunity for food growing and celebration.
- Mobility: Interconnected urban network facilitates easy passage of cycles and pedestrians.
- Health: Re-introducing daily activity such as walking and cycling into daily lives
 positively affects individual health and reduces incidences of obesity and cardiovascular disease.
- Ecosystems: 46% of Markham is urbanized; within this area, streets, yards and parks offer significant opportunities for naturalization initiatives. Any increase in vegetation in these areas also creates habitat and reduces the heat-island effect (an urban forest can help reduce urban ambient temperature by absorbing sunlight that would otherwise be reflected by hard surfaces). Finally, network connectivity in urban areas can connect with regional ecosystems and green areas.
- Culture and Identity: Cultural heritage and interpretation of open spaces contribute to a sense of place and creates neighbourhood destinations.



- **Urban Trail Network:** Develop an urban trails and greenway network that facilitates walking and cycling to major civic institutions and employment areas within the community, specifically:
 - o Prioritize off-road trails and greenway networks.
 - o When off-road routes are not feasible or viable, provide safe and separated bike lanes within the street right-of-way.
 - o When separated on-road cycle lanes are not viable, implement safe and convenient on-road cycling lanes within the street right-of-way.
- **Habitat Enhancement:** Take a 'habitat enhancement' approach to park planning, maintenance and management for all new landscaped areas. Make use of public lands and power line right-of-ways for planting of native plants.
- **Urban Forest:** Create an urban forest and set achievable targets for urban canopy coverage in public open spaces. Continue the Trees for Tomorrow tree-planting program and funding, but focus efforts to be consistent with an urban-forest strategy.
- **Educational Resources:** Develop eco-education resources for homeowners and businesses to raise awareness of landscape planting and management practices that promote habitat creation.
- **Maintenance:** Maintain pedestrian paths and bicycle trails year-round at the same service levels as automobile routes.
- Meet the Needs of an Aging Population: Provide places to rest, orient, get a drink of water, or use a washroom within the public realm of trails and greenways.





FUNCTION STRATEGY:

Robust and Resilient Infrastructure



Sustainable communities are supported by reliable and resilient infrastructure that adapts to the needs of users and our changing climate. Robust infrastructure requires less energy to function, harnesses natural processes, and is relevant to evolving community form.



GOAL 4:

Net Zero Markham Buildings and Property: Balanced annual consumption and production of Energy, Water, Waste and Emissions by 2050

Regulate, require, incent, provide programs and resources to move private building owners to net zero energy, water, waste and emissions by 2050.

How this goal addresses Markham's priorities:

- **Education:** Learning opportunities for homeowners and businesses related to energy efficiency, renewable energy and green buildings.
- **Health:** Greener buildings promote material use and construction techniques that produce healthier indoor environments.
- Identity and Culture: Buildings in Markham will be open and inviting, enhancing public space and facilitating our integrated open-spaces network.

- Ecosystem Integrity: Our buildings and their surrounding grounds should provide and enhance wildlife habitat, for example, birdhouses on-site.
- Shelter: New homes in Markham must be flexible to allow for changing family demands. Retrofits should not be limited to energy improvement. They must allow for intensification and many generations of one family living comfortably under one roof.
- Materials Management: Green buildings create demand for recycled materials and green technologies, services and materials. Buildings must be built or retrofitted to facilitate waste diversion and avoidance.
- Energy & Climate: The largest source of GHG emissions in Markham is from buildings (66% of total emissions from buildings, 45% from single detached alone). Focus on improving the performance of all buildings, including existing single detached homes to mitigate climate change by reducing GHG emissions.
- Water: Change how water is supplied and treated in Markham. Implement strategies that appropriately value the quality of potable (drinking) and non-potable water supplied and the treatment of storm and waste water. Supply-pricing strategies should drive consumers to reduce potable water consumption by conservation and efficiency, and to move to non-potable water for needs like toilet flushing, irrigation and process use. Pricing strategies for storm and waste water removal should reflect the costs required to reuse and recycle these water resources as non-potable water.
- Economic Vibrancy: Markham's aggressive building targets will create expertise and leadership that our developers, builders and contractors will be able to market and export to other jurisdictions.

OBJECTIVE:

Existing buildings that aggressively improve resource efficiency, reduce waste and emissions

Existing buildings present Markham's largest opportunity to make significant community greenhouse gas emissions reductions. By 2031, if today's buildings do not undergo efficiency retrofits, they will contribute 42% of Markham's greenhouse gas emissions. New stock built between today and 2031 is predicted to contribute 26%.

Recommendations:

• Educational & Awareness Resources: Increase building owner and operator awareness of the importance of climate change mitigation through energy efficiency and renewable energy generation in existing buildings. Benefit from



- Town energy efficiency and renewable energy generation leadership by hosting building manager information-sharing events and developing regular report newsletters that communicate financial and environmental benefits.
- Retrofit Programs: Develop with owners and contractors home and commercial building retrofit programs that aim for net zero and greener buildings, making full use of policy and regulatory tools that leverage partnership and funding opportunities.
 - o **Infrastructure Mining:** Enable developers to find or mine efficiency opportunities in the larger community to make their projects net zero.
 - o **Density:** Special incentives should be developed that promote intensification in developed areas.
 - o **Energy Modelling:** Require intensive and accurate energy modelling as part of the integrated design process for permitting for all retrofit buildings. Mandate that retrofit building design and orientation, where possible, are optimized for passive solar gain and shading, depending on the season.
 - o **Operations:** Develop education, incentive tools, and monitoring programs so that retrofit buildings are continually operated to meet or exceed their original energy-model efficiency.
 - o **Adaptive Use:** All retrofits must be flexible to allow for the changing needs of families and businesses as they age.
 - o **Renewables:** Whereever possible, retrofits should include renewable energy systems, or at minimum, be renewable energy-ready.
 - o Reuse, Recycled and Regional Content: Retrofit buildings should aim to reuse as much of the existing building as possible. Set targets for recycled and regional material content for retrofit buildings as a means to create demand for recycled materials.
 - o **District Energy:** Make distributed energy-ready retrofits in neighbourhoods where infrastructure is in place or contemplated.
 - o Water: Make retrofits dual-plumbing system-ready. In addition to the existing potable meter, install during retrofits non-potable, waste and storm water metres. By measuring and charging for usage and waste, consumers will be empowered and incented to conserve and find efficiencies.

o **Awards:** Implement green building award program(s) to raise the profile of retrofit developments, their developers and operations teams, for achieving excellence in building performance.

2.1.2

OBJECTIVE:

New buildings must be high-performance and green

- **Commitment:** Accept the Living Building Challenge 2.0 by requiring that all new Town buildings meet this standard starting in 2015. From 2010 onward, all new Town buildings should achieve LEED Gold minimum.
- **Green Building Strategy:** Develop a strategy for net zero, green buildings for new buildings with developers and builders. In the strategy, ensure development approval processes do not create barriers to implementing net zero buildings and align all policies and regulations to reduce any barriers to net zero building development.
 - o **Density:** Special incentives should be developed that promote intensification in undeveloped areas.
 - o **Energy Modelling:** Require intensive and accurate energy modelling as part of the integrated design process for all new buildings. Mandate that building design and orientation be optimized for passive solar gain and shading, depending on the season.
 - o **Operations:** Develop education, incentive tools, and monitoring programs so that new buildings are continually operated to meet or exceed their original energy-model efficiency.
 - o **Adaptive Use:** All new buildings must be flexible to allow for the changing needs of families and businesses as they age.
 - o **End-of-Life:** All new buildings should be constructed to have long-service lives and to be deconstructed and recycled readily.
 - o **Renewables:** Wherever possible, retrofits should include renewable energy systems, or at minimum, be renewable energy-ready.
 - o **Recycled and Regional Content:** Set targets for recycled and regional material content for new buildings as a means to create demand for recycled materials.
 - o **Distributed Energy:** New buildings should be distributed energy-ready in neighbourhoods where infrastructure is in place or contemplated.

- o **Water:** New buildings must be dual-plumbing system-ready. Install potable, non-potable, waste and storm water metres. By measuring and charging for usage and waste, consumers will be empowered and incented to conserve and find efficiencies.
- o **Awards:** Implement green building award program(s) to raise the profile of retrofit developments, their developers and operations teams, for achieving excellence in building performance.
- o **Split Incentive:** Adopt or develop financial tools and programs that balance the 'split incentive' where energy efficiency improvements are paid for by the builder, but savings are reaped by the occupants.

GOAL 5:

Smart, Resilient, Adaptable, Integrated and Load-Balanced Water, Energy, Waste and Information Infrastructure and Services

Build and retrofit public infrastructure systems and develop programs that enable net zero resource use and are adaptable to climate change.

How this goal addresses Markham's priorities:

- **Economic Vibrancy:** Local employment generation from research, development and testing of new smart technologies in Markham by Markham companies from local infrastructure construction.
- **Energy & Climate:** Neighbourhood-distributed and networked combined energy and water systems reduce emissions and reuse waste water, promoting greater local resilience that contributes to climate change adaptation.
- **Materials Management:** Waste diversion potential with integrated infrastructure and targeted waste-diversion strategies.
- Access & Mobility: Resilient information infrastructure will allow telecommuting, low- or no-cost wireless access across the Town, and emergency bulletin distribution swiftly.
- Energy & Climate: The largest source of GHG emissions in Markham is from buildings (66% of total emissions from buildings, 45% from single detached alone). Focus on improving the infrastructure, allowing buildings to contribute to climate change adaptation and mitigation.
- Water: Our infrastructure will be retrofitted and built to treat water as a resource that can be continually reused and recycled. This will make Markham less reliant on others for water and more resilient in the face of climate change.



OBJECTIVE:

Develop Smart, Reliable, Load-Balanced, Adaptable and Integrated Infrastructure Networks

- Infrastructure Monitoring: Develop the ability to monitor, understand, manage and control infrastructure to use resources optimally and ensure a high level of service.
- **Smart City Initiative:** Partner with technology firms and infrastructure industry to develop Smart City technologies tested in Markham and delivered to the world.
 - o Initiatives could include: traffic/roads, parking, street lighting, energy services management and electric vehicle demand and supply to the grid.
 - o The first initiative should be a Smart Water system that collects live water usage-and-supply information.
- Load Balance: Utilize existing infrastructure better by actively developing programs that will flatten water, energy and transportation demand peaks. The Town should take a leadership position and give staff the opportunity to start work after rush hour. This will shift staff's energy and water demand at home, reduce congestion and commute times to work.
- **Distributed Systems:** Move away from centralized systems to distributed but interconnected networks of smaller systems that will be smart, flexible and adaptable. These systems should be able to store and release resources as required.
- Integrated: Combine distributed water and energy systems into one. Operate distributed storm water harvesting and waste water treatment systems with district energy systems. Integration will allow for many synergies: capture of waste heat from waste water for energy processes, water reuse/recycling for non-potable process use by the energy system and the local neighbourhood.
- Waste Energy: Take advantage of any waste energy by locating process or uses near areas where energy is waste to the environment. For example, large data centres require significant cooling year-round. Their waste heat could be used to heat their neighbours via a distributed energy system.
- **Green Energy:** Implement distributed carbon neutral energy systems for the heating and cooling of Markham's new and retrofitted buildings. For Markham's existing district energy system, pursue an energy "greening strategy" to replace natural gas-powered equipment.

• **Storm Water Management:** Implement and integrate into the planning process context-appropriate ecological storm water management practices that first use natural processes like bioswales, permeable paving, street's trees and others before harvesting the resource for non-potable water system supply. Ensure a site's natural hydrology is maintained and enhanced.



- **Culture Shift:** Develop a culture of conservation and waste minimization water, energy, materials, and other resources through education and access to real-time information.
- **Community Diversion Days:** Schedule two days a year where Markham residents will place used, but not used up, items on their curbside for other residents to select and take home for continued use to reduce waste generation.
- Seek Commitments from Businesses: Work with local businesses to adopt zerowaste strategies and seek partnerships with local business to accept returned waste materials generated by consumer goods purchased at the business.
- **Producer Responsibility:** Where possible, require or advocate producer responsibility regulations for waste materials.
- **Green Procurement:** Ensure service agreements for municipal services include sustainability provisions such as requirements for energy efficiency, renewable energy generation, zero-waste management, reuse of recycled materials, and/or achieving social objectives such as local employment targets.
- Increase Waste Diversion: Address diversion opportunities for 'non-residential' waste such as commercial and small businesses, government operations and services such as Libraries, Parks, Community Centres, Fire, Police, Administration, and Works. Consider alternative technologies for managing waste materials, such as "Pipe Technology" for large-scale new developments
- End-of-Life Financing: Require that materials not readily recyclable be taxed at a rate commensurate with their safe disposal cost.





GOAL 6:

Viable Ecosystems and Landscapes: Net increase in extent of Natural function within Markham's urban environment and preservation of existing natural areas

How this goal addresses Markham's priorities:

- **Education:** Wild spaces and naturalized areas provide opportunities for an 'outdoor classroom'. Focus on the value of wildlife to our society.
- **Ecosystems:** Increasing natural areas, including networking open space, that allows for storm water absorption, healthy stream environments, and wildlife habitat. Ecosystems and their processes will improve air and water quality.
- Climate and Energy: Increased tree and green coverage in Markham will reduce urban heat-island effects, lowering ambient temperatures, reducing summertime cooling demands, therefore decreasing overall energy use and mitigating climate change.



OBJECTIVE:

Thirty percent tree canopy and vegetation coverage in the urban environment

- **Urban Forest:** Develop and maintain an urban-forest planting strategy and plan.
- Native Species: Improve natural processes in urban areas by using native and
 resilient plant species. Specify plant species that are "Climate Change-Ready".
 These plants are native and diverse, should prevent or manage potential invasive
 species, and be resilient in the face of extreme weather events and increasing
 average annual temperatures.
- Markham Nursery: Create a native tree-and-plant nursery to supply the Town's and residents' needs.
- Appropriate Tree Type and Location: Develop rules and guidelines with academic and industry experts for tree type and placement for homeowners and developers, maximizing energy efficiency.
- Wildlife Habitat: Implement private development landscaping standards by integrating plant species and planting strategies that attract songbirds, insects and other urban animals. Do not limit to ground level. Green roofs and green spaces in or on buildings can provide wildlife habitats as well.

- **Private Sector Codes:** Revise standards and make use of green building rating programs (such as LEED™) to advance native landscaping requirements and site-canopy coverage.
- **Tree Care:** Provide education and assistance programs for homeowners to properly care for and manage their trees, extending their lives as long as possible.
- **Understory and Canopy Regeneration:** Ensure that new trees are planted to replace aging trees in mature areas.
- **Reclaim Urban Timber:** Harvest end-of-life tree materials for recycling and reuse within Markham.
- Harvest the Fruits: Street fruit and nut trees will assist in providing green space as well as local food opportunities.



OBJECTIVE:

Develop and support wildlife habitat

- Connect Disconnected Green Spaces: Deliberate connection of disconnected spaces to allow wildlife movement across the Town.
- Flexible Multi-Faceted Landscapes: Provide green spaces that are biodiverse, climate-adaptable, flexible and for all creatures' enjoyment.
- Renaturalize: Streams and habitats that have been built over by restoring watersheds and subwatersheds of the Don and Rouge Rivers.
- **Natural Heritage Network:** Develop an interconnected Natural Heritage Network. Work towards connectivity between existing green spaces and ensure they are of sufficient quality and size to support wildlife.
- **Urban Edge:** Define a physical urban/rural boundary that preserves remnant green spaces and agriculture by utilizing strong land use and design tools.
- **Refuge:** Work with local partners to develop a local wildlife refuge, shelter and rehabilitation centre.





GOAL 7:

Create & Support a Local Food System: Significantly increase food growing, celebration and processing in Markham

How this goal addresses Markham's priorities:

- **Social Equity:** Families can reduce household food expenditures if they are able to grow their own food.
- Health: Garden-grown food and gardening promote healthy eating and living.
- **Food Security:** Local food-growing and processing will increase food security in Markham.
- Identity & Culture: Local food-growing reinforces Markham's identity as an agricultural community and will provide culturally appropriate foods to residents.
- Education & Skills: Families can make food choices that are healthier, better for the environment, more ethical, and that support the local economy.
- Local Economy: Local jobs can be created as food-growing, processing and celebration opportunities increase.
- **Energy & Climate:** Localizing food-growing and processing can help reduce GHG generation.



OBJECTIVE:

Support education and engagement in the local food system

- Food Policy Council: Create a group of representatives from many sectors of the food system to identify opportunities in Markham.
- **Food Literacy:** Provide training for food preparation, cooking, nutrition, ethical and environmental choices, and growing at existing facilities or create new facilities (community kitchens, community food centres).
- **Incubate New Farmers:** Create training, mentorship and land-access opportunities for youth and immigrants.
- **Garden Network:** Assist gardeners in sharing knowledge and resources through events, workshops and resources.

- **Reduce Food Waste:** Divert food from the waste stream through targeted efforts, including promoting small-scale composting.
- Food Asset Inventory: Conduct an inventory of the Town's food-related assets and infrastructure (such as buildings, land and kitchens) to maximize the use of existing facilities.

2.4.2

OBJECTIVE:

Significantly increase community food-producing opportunities

- **Community Gardening:** Plan and implement community gardens on townowned land.
- **Private Community Gardens:** Implement requirements for community garden plots for higher-density developments that meet the needs of residents.
- **Backyard Sharing Program:** Provide a forum for residents to share available land and gardening knowledge.
- **Learning Gardens:** Promote healthy eating and living by promoting local food, developing demonstration gardens and implementing food-growing educational programs at town facilities.
- **Community Orchard:** Plan and implement community-based orchards as part of enhancements to the urban canopy.
- **Residential Soil Standards:** Set soil standards in new communities so that yards and boulevards are "garden-ready" and provide assistance to existing neighbourhoods to amend soil.
- By-Law Alignment: Review all Town by-laws to ensure the support of food production within the urban boundary.



OBJECTIVE:

Significantly increase the viability of local commercial food-growing and processing

- Agricultural Assessment Study: Implement the recommendations from the adopted study, including ongoing consultation, advocating long-term leases, financial incentives, land-use policy, farm-friendly infrastructure, and innovative programs.
- **Celebrate Local Food:** Promote existing and support further food events that focus on local, seasonal, and culturally diverse foods.
- **Town Leadership:** Support locally produced, seasonal and sustainable foods at Town facilities and functions, and promote healthy vending in local schools and institutions.
- Increase Opportunities: Encourage roadside food sales, kiosks in high-traffic areas, local independent stores, and Community-Supported Agriculture (CSAs) to increase opportunities for farmers to sell food locally.
- Urban Agriculture: Establish small plot intensive (SPIN) farming support network.
- **Food Precinct:** Plan and promote the development of a food precinct as a means for local food brokerage, vending, processing and consumptions to create greater connections between local farmers and their markets.
- **Economic Planning:** Further incorporate the production and processing of local food into Markham's future economic plans.
- **Climate Change:** Ensure that the impact of climate change on agriculture is considered in mitigation and adaptation studies and strategies.





Support Continuing Health and Prosperity



Sustainable communities promote individual and community health and create opportunities for people to meet their physical, intellectual, and emotional needs.



Healthy People: Proactively create the conditions for physical and mental health within Markham for all citizens

How this goal addresses our priorities:

- **Social Equity:** Fosters community interaction, and develops teamwork and leadership. Welcoming services and interaction with fellow citizens promote understanding and learning.
- **Identity & Culture:** Promotes a sense of belonging through celebrations, festivals and block parties.
- **Individual Health:** Supports and promotes active living and healthy lifestyle choices through partnerships with neighbourhood schools, community gardens, and social clubs, with an emphasis on neighbourhood-focused retail, walkable streets.
- **Food Security:** Nutritional, healthy and culturally appropriate foods to nurture physical and mental health.
- Access & Mobility: Complete and connected neighbourhoods encourage active transportation.



• Education & Skills: Promote greater participation in town recreational programs and services.



OBJECTIVE:

Promote and support physical health of Markham citizens

Recommendations:

- Provide equal access to all public recreation programs for Markham citizens, regardless of means.
- Establish safe routes to schools and walking school bus programs with York Region School Boards.
- Develop a plan where community facilities act as heating or cooling centres during times of need.
- Develop and deliver healthy eating and lifestyle curriculum and vending with Markham Libraries and Community Centres and local schools.
- Ban smoking at all sites and buildings that serve the public in Markham, including public outdoor areas.
- Eliminate sales of high-calorie, low-nutrition food and drink from public facilities and discourage marketing of these items to children.



OBJECTIVE:

Promote and support the mental health of Markham citizens

- Coordinate, monitor, and align with public health organizations to ensure comprehensive mental health services are available within community facilities at no cost.
- Partner with agencies to provide accessible lifelong learning opportunities.
- Work with neighbourhoods to promote a sense of belonging by ensuring that they are well-cared for, safe, inspire pride, create a sense of spiritual well-being and increase opportunities for neighbours to meet (celebrations and festivals).
- Reduce isolation of vulnerable individuals by providing accessible services, support networks, outreach and community spaces.
- Establish community connection programs that put seniors and youth together.

• Foster a sense of openness and understanding about mental health within the community.



Reduce the impact of household poverty

Recommendations:

- Engage and empower vulnerable residents to build individual and neighbourhood capacity to address economic and social challenges.
- Develop housing and transportation geared to income housing affordability strategy.
- Assign social planning role within town.
- Work toward 10,000 new jobs (10% of new 2031 ELE jobs) to be provided through local economic development and/or poverty reduction initiatives.
- Partner with local businesses to develop criteria and set targets for employing low-income individuals who reside in Markham (e.g. 5% local employee target for large businesses).
- Create community resource centres in schools, libraries, and community centres where goods and services can be exchanged, reclaimed or recycled.
- Partnerships for food programs, clubs and growing.



GOAL 9:

Inclusive and Engaging Government: Council and Committees are representative of Markham's cultural, household income, and gender composition

How this goal addresses our priorities:

- Social equity opportunities for greater youth involvement.
- Markham's Mosaic Index is one of the highest in Canada (if not highest).
 Welcoming services and interaction with fellow citizens promote understanding and learning.
- Diversity under-representation on Council and Committees is highest in Canada.
- Maintain performance as community grows.





OBJECTIVE:

Encourage greater existing and new resident involvement in decision-making and community stewardship

Recommendations:

- Civics classes to help residents understand the planning, infrastructure and budget process, so they know how to ask for changes in their community.
- Work with governmental service providers to coordinate and integrate service delivery within neighbourhoods.
- Build upon the success of the Ratepayers Association's model to implement an "Active Neighbourhood Associations" governance model, to empower individuals to be more active in neighbourhood environmental, social and economic stewardship, program and services delivery and local decision-making.
- Identify committee representation criteria and strategically target corresponding demographic groups for participation on Town committees to achieve a more representative membership. Where required, provide appropriate level of support services to ensure success of more diverse committees such as personal assistants, and signing and language support.
- Develop a community engagement policy and approach to ensure greater diversity of involvement in community planning and increase voter turnout.



OBJECTIVE:

Promote greater youth involvement in decision-making and participation

- Develop social media as a means to communicate with youth.
- Develop a shadow youth council where members of council and staff serve as mentors to engage youth in the political process.
- Develop targeted services to engage at-risk youth.
- Seek youth input in planning decisions and other decisions that shape the community.
- Create spaces for youth at community centres and the Civic Centre.
- Encourage youth to celebrate the community and their neighbourhoods through festivals and events.

- Create mentorship opportunities for youth in Markham, including peer-to-peer and adult-to-youth.
- Create a compensation mechanism to make servicing in government attractive for youth.



GOAL 10:

Nurture Sustainable Economic Development: create 100,000 new jobs

How this goal addresses our priorities:

- **Social Equity:** Higher than York's average low-income households and child poverty. Targeted local employment programs/services for this group will provide greater security and should decrease costs associated with travel to work.
- **Identity & Culture:** Businesses that capitalize on local assets reinforce Markham's identity.
- Food Security: Agro-business efforts improve the viability of farming operations.
- **Economic Vibrancy:** Local renewable energy generation has potential for local green jobs.



OBJECTIVE:

Facilitate and support Markham's existing businesses

- Implement Markham 2020 Strategic Directions economic development plan.
- Implement a buy-local campaign for locally produced or packaged goods and services.
- Engage businesses to work together to identify opportunities for local business growth.
- Develop Eco-Business Districts that promote business networking and information sharing that aim to reduce greenhouse gases, energy consumption (from buildings and transportation) by businesses and/or business parks.
- Promote community and business mentorship programs for Markham's youth, underemployed and new Canadians that seek to create awareness of workplace skill requirements and professional work environments.
- Facilitate businesses that have active employees through live-work balance, healthy lifestyles, and bicycle facilities.



OBJECTIVE:

Promote green business development and business greening strategies of existing and new employers

Recommendations:

- Strategically target 'green jobs'.
- Create demand for local employment in the green energy sector and local food production and processing.
- Engage all sectors to promote sustainability excellence through research and new technology deployment.
- Promote viable local food businesses and services.
- 25,000 green jobs (25% of new 2031 ELE).
- Work with local farmers and energy producers and distributors to develop infrastructure to produce energy from waste (animal and/or fibre waste) and/or crop products using methods that do not contribute to reduced air, water, or soil quality or cause human health issues.
- Work with industry to develop a Markham-based centre of green technologies.
- Create green incubators and mentorship opportunities.



OBJECTIVE:

Support diverse employment opportunities throughout Markham

Recommendations:

- Promote employment activities within areas that are served by higher-order transit.
- Increase the number of market-viable businesses within walking distance of residential land uses.



GOAL 11:

A Culture of Excellence

How this goal addresses our priorities:

• Social equity higher than York's average low-income households and child poverty; targeted local employment.

- Develop institutions focused on entrepreneurial, cultural, and athletic excellence.
- Develop future generations of leaders that will support Markham from within and beyond.
- Maintain affordable places for incubating innovation.
- Maintain or increase library visits/usage.
- A strong sense of community is a result of healthy social interaction and cultural understanding. Cultural and artistic expression is a catalyst for these outcomes.
- As community grows, new facilities will be required, thus creating opportunities for venue and programming diversity.
- Placemaking guidelines reinforce community identity.
- Neighbourhoods are places where it is safe to play and work, are clean and cared for, and promote a culture of walking.
- Increasing learning opportunities can increase the participation in learning and skills development ability, therefore improving employability.



- Promote access to education and skills development opportunities at all stages of life and career.
- Work with local schools to develop sustainable curriculum programs for residents, businesses and students.
- Seek partnership (York Region School Boards, private service providers, libraries) for home or distance learning that is affordable, accessible, and innovative.
- Promote awareness of sustainable living choices.
- Ensure barrier-free access to education, training and skills development by promoting affordability and language-skills development.
- Promote sustainable curriculum programs for residents, businesses and students (e.g. green roofs for buildings, energy efficiency in the home, etc.).
- Promote arts and cultural education within schools, private sector, community centres and libraries.

- Use of schools as neighbourhood resources, including gyms, libraries, computers and meeting spaces.
- Create the University of Markham and other partnerships to increase postsecondary education in Markham.

3.4.2

OBJECTIVE:

Promote and celebrate all that makes Markham great

- Implement Markham's Integrated Leisure Master Plan.
- Implement 'Global Citizenship' programming for citizens and 'Business Greening' networking / information sharing for businesses.
- Capitalize on Markham's history, natural heritage and diversity for marketing and branding.
- Harness the talents of new residents.
- Develop urban design placemaking guidelines for all new Markham development that reflects the community's heritage, natural setting and cultural diversity.
- Implement a Public Art Policy.
- Create a community coordinator position for festivals, community events and engagement exercises that aim to foster cross-cultural understanding and experiences.
- Support and enhance Markham's arts community by developing more opportunities and venues for theatrical and artistic (including visual arts, music and dance) expression.
- Develop programs and events that celebrate and explore those aspects of Markham that all cultures share (e.g. food celebration, stories of settlement, music, etc.).
- Facilitate interaction among diverse cultural groups at events and facilities.
- Markham placemaking guidelines for all new development; doubling of cultural venues by 2030.
- Increase opportunities for pedestrian-oriented travel.
- Cultural heritage is protected and celebrated.
- Work with the business community to promote corporate social responsibility.



In addition to the recommendations provided for the specific strategies, goals, and objectives, the following overarching recommendations are provided to monitor the progress of the Greenprint.

- Task Sustainability Office to:
 - o Measure and report indicators every two years to determine progress.
 - o Facilitate partnerships among governments, non-governmental organizations, institutions, and the business community to align common goals and objectives and to avoid duplication of services.
 - o Seek out funding opportunities for implementing the strategies.
- Build capacity within individual commissions to achieve sustainability.
- Provide strong leadership within and beyond local government to achieve a Markham-defined sustainable outcome.





Markham's Greenprint Implementation Story

The Greenprint is a long-term plan with a 50 to 100-year horizon. In order to achieve the priorities and strategies, planning for short, medium and long-term milestones is important and necessary.





Foundation for Success: Short-Term Focus (2010 – 2015)

This is a period of developing deep support within the community and with all levels of government for positive, sustainable change. Engagement, education, and the creation of deep awareness are key strategies for building support for bold, innovative initiatives and sometimes, difficult choices. Within the halls of the Town Hall, staff members are busy bringing all plans, bylaws, operations and programs into alignment with the community's sustainability priorities and strategies. This is a multi-year undertaking that is strategic and coordinated. Key staff, sometimes new, are identified and empowered to lead cross-departmental initiatives, and budgets are allocated to ensure success. During this period, leap-frogging opportunities – progress by large jumps instead of small increments – are not missed. New neighbourhoods, such as Markham Centre and Langstaff and others, create opportunities for accelerating social innovation and sustainable technologies. New housing models, adaptable and smart infrastructure systems, and different approaches for creating 'community' are explored. In all of this, the Sustainability Office is busy creating community and staff agents of sustainable change; partnerships are struck, pilot projects are launched, active learning and adaptive management are taking place. The Office is also busy monitoring and reporting on progress with the community and Council while also offering best-practice research support.

Traction & Innovation: Medium-Term Focus (2015 – 2025)

This is a period where projects are finally off the drawing table and actively underway or completed. Community members not only can see what is meant by 'sustainability', but they can experience all the hard and soft benefits. Communities like Markham Centre, Langstaff and others bring new life to the term 'complete neighbourhood' (See Strategy 1). This creates a growing desire for Markham's existing neighbourhoods to regenerate, to modify their structure and built environment to allow for more sustainable lifestyles to take root. Markham is a community that is confident in the choices it made. This same confidence allows for innovation to be accelerated. In the halls of the Town Hall, efforts and initiatives aimed at deeply integrating sustainable priorities into all governmental operations, were successful. The Sustainability Office is dismantled and a culture of deep sustainability has emerged, with staff, with elected officials and with community members. Community sustainability performance is accelerating rapidly and Markham has emerged as a leader in community sustainability globally.

Adaptive & Resilient: Long-Term Focus (2025+)

The community's sustained focus and hard work means that Markham is finally approaching its desired sustainability performance (as outlined in its sustainability priorities, see Chapter 2). Markham is carbon neutral, achieving high levels of social equity, and community members are healthy and prosperous. Markham's diversity is reflected in all levels of government; decisions are inclusive and meet the needs of all residents. Community members have unprecedented housing and mobility choice with world-class access to natural areas and active recreation. Green jobs are plentiful and businesses are benefiting from access to a creative and diverse workforce. Global fossil fuel reserves are severely depleted and old-timers reflect on how the local climate 'used to be when I was young'. Yet, the community is resilient and adaptable to these, and other, growing global and local changes. Markham is operating as a healthy system and is now home to 500,000 people. Markham is a veritable powerhouse that is actively taking advantage of its leadership. People from around the world visit Markham to experience 'how it can be done' and leave richer, inspired to implement change.

The story outlined above might be ambitious and from a future vantage point, it's certain that Markham's journey towards sustainability could unfold quite differently. Regardless of how it unfolds, one thing is for sure: without ambition and a vision for what Markham aims to become and how it intends to do so, achieving the above will never occur. With this understanding and the knowledge that Markham's journey towards sustainability will be one of learning, change and innovation, the following strategic implementation recommendations are provided to guide efforts and initiatives.

Key Strategies for Successful Plan Implementation

1. Integrate sustainability priorities and strategies into regular Town business.

- a. Departmental Sustainability Strategies: The Sustainability Office will work with each Town department to develop strategies for priority integration and plans that identify and develop implementation actions to achieve sustainability goals.
- b.Coordinated Project Management of Cross-Departmental Initiatives: Many initiatives will be cross-departmental. These projects are ideally suited for management by the Sustainability Office and/or strategically identified staff teams.
- c. Champion Development: In all efforts, champions of sustainable change will be supported and encouraged to take initiative in their jobs and in community initiatives.

2. Culture of innovation and leadership

- a. The Role of Pilot Projects: It is very important to learn by doing. Pilot projects will be encouraged as a 'standard practice' to promote policy and operational change. Town staff and community members will work together to co-develop and monitor pilot projects. Successful pilot projects will be implemented as standard practice.
- b. Corporate Leadership: The Town of Markham as a corporation will continue its role as a leader in demonstrating successful sustainability initiatives. Markham will more proactively share lessons learned and work with community partners and business to navigate internal management and operational changes that lead to greater sustainability performance.
- c. Partnerships & Leveraging: In acknowledgment that there are often jurisdictional and/or resourcing constraints, partnerships will be more aggressively pursued, with all sectors, to promote greater involvement and maximum leveraging of resources. The Town will also play the role of partnership broker to ensure all available resources are working towards common sustainability objectives.





3. Monitoring, Measurement & Reporting

- a. Monitoring & Measurement: The Town commits to monitoring sustainability performance, using sustainability indicators, and the status of implementation of sustainability strategies, specifically:
 - Sustainability Performance Monitoring: The following list of performance indicators were selected to ensure that the Town's strategies are achieving the desired effect. These indicators rely on a range of data sources. Statistics Canada's Community Census data is a main information source. For this reason, measurement initiatives can be undertaken at least every five years. Where possible, indicators will be measured more frequently.
 - Goal Implementation Monitoring: The Town will develop implementation metrics that allow for reporting on the status of goal implementation. These metrics will be monitored and reported annually.
- b. Tools for Ongoing Reporting: The Sustainability Office will develop simple tools that will facilitate ongoing and regular reporting for all reports and initiatives. Reporting tools will be developed to facilitate a common understanding of how the initiative is allowing the Town to achieve its desired sustainability performance.

4. Shared Responsibility & Active Citizenry

- a. Shared Governance: Fundamentally, Markham's sustainability journey will be one of learning, change and innovation. Acknowledging that change must be managed and that community support is critical to success, the Town intends to develop Strategy Task Forces that will play an early and ongoing role in ensuring that the community's sustainability vision is implemented. The Town will develop Terms of Reference for the Task Forces and anticipates that the Task Forces will be representative of the community's diversity.
- b. Community Engagement: The Town intends to take a co-creative and educational approach to ensure community buy-in for the necessary change to take place. Accordingly, the Town will develop a community engagement strategy that will ensure consistency in engagement approaches as well as ensure meaningful community participation in all initiatives.





APPENDIX A Markham's 2008 Sustainability Performance



Environmental Health
Social & Cultural Well-Being
Economic Vitality

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Sustainability Baseline: Overview

Our story to date has been that of a rapidly growing community transitioning from a suburban town to a major urban centre. Our population has experienced significant growth over the past few decades. In 2006, Markham had a population of 262,573 and experienced a 25.4% growth rate between 2001 and 2006 alone. Today, our community stands as Canada's most culturally diverse, with over 65 cultures and languages.

Our next chapter involves creating a sustainable future. Our aim is to harness growth and other forces of change, such as climate and demographic change, to contribute to positive sustainable change. Our efforts will benefit from established momentum. Markham is a recognized leader in the Greater Toronto Area (GTA) and Ontario for planning and developing sustainable urban developments, such as Markham Centre and Cornell, and many environmental protection initiatives. All of these efforts have sought the same outcome: deliver an exceptional quality of life for today's and tomorrow's residents.

This Sustainability Baseline marks the beginning of our journey as we develop the Greenprint: Markham's Sustainability Plan. The Greenprint will provide a framework for community sustainability as a means to co-ordinate, prioritize and implement its strategic sustainability goals and objectives.

The Greenprint will:

- Contain an inspiring vision for a sustainable Markham
- Provide clear social, cultural, environmental and economic goals and targets
- Integrate existing related sustainability initiatives
- Provide a baseline assessment of Markham's sustainability performance
- Act as Markham's Climate Action Plan, and
- Serve as Markham's Integrated Community Sustainability Plan (ICSP) that meets the requirements of the Federal Gas Tax Agreement

Purpose of our Sustainability Baseline

The baseline uses available data and mapping to provide a snapshot of Markham's current sustainability performance. Using key performance indicators, this report provides an overall picture of how well Markham is doing in key areas and where there are areas that need particular attention. The content in this report will serve as the basis for ongoing action planning in the following ways:

The Basis for Understanding 'Sustainability'

Markham is known for its environmental leadership and measurement in the York Region and GTA. This baseline will serve as a more complete sustainability snapshot as it relates to social, cultural, economic as well as environmental performance.

Measuring Progress Today and Tomorrow

Performance is measured by using indicators – indicators that are aligned with Markham's sustainability goals. Indicators seek to 'tell the story' of how well the community is performing or where there needs to be improvement. With indicators, however, there are limitations; no one indicator or set of indicators can tell the full story. The main aim of measuring indicators is to facilitate decision-making; they provide a frame of reference that informs whether an investment, program, policy or project will negatively or positively affect performance in a key area. Regular measurement (e.g. every 3 to 5 years) provides clarity regarding what is working and what is not. There is an expression regarding indicator reports: "the most informative report is the 2nd". The full potential of indicator reporting, beyond the initial baseline, is made clear when subsequent reporting occurs; it's at this stage that a community can discern whether their efforts are leading to the desired outcomes.

Basis for Target Setting

Measuring implies that a certain level of performance is desired. Indicators and performance targets provide a frame of reference for saying 'we made it!' or, 'more work is required'.

Note: This baseline assessment uses data heavily from the 2006 census, as well
as other sources. While it is considered a 2008 baseline, the data actually ranges
from 2006 through to 2009. Going forward, the next baseline will be able to use
data from one calendar year.

What Do We Need to Sustain?

To make progress on community sustainability, we must focus on the basics – the basics that keep us alive, happy, healthy, competitive economically, and ensure we are living within the means of our planet. Focusing on these basics is our best strategy for ensuring that all of our citizens, including future generations, enjoy a high quality of life in our community. "Sustainable development", a concept that emerged on the global scale through the release of the United Nations Brundtland Report in 1987, is our framework for ensuring long-term social and cultural well-being, economic vitality and environmental health. The following fundamental sustainability goals were developed through community and stakeholder engagement in 2009. Through the development and adoption of the Greenprint, these goals will be applied to all aspects of community planning and development, governance and operations.



IMPLEMENTATION STRATEGIES

PLACE:

Create complete neighbourhoods as the foundation of a great community.

FUNCTION:

Create and maintain robust and resilient infrastructure.

PEOPLE:

Support continuing health and prosperity.

Today's and tomorrow's citizens enjoy all that Markham offers as well as a high sense of belonging, regardless of age, gender, ethnicity, orientation, income, health, physical and mental ability.





1. Social Equity
A Community Where All People Can Thrive

A socially equitable society is one in which citizens have equal opportunities and rights, regardless of age, gender, culture, sexual orientation, religion, ethnicity, income, health and physical or mental ability. Social equity includes equal rights to security, the right to vote, freedom of speech and assembly, and equal access to education, housing, health care, recreation and other services. Some individuals and groups require increased levels of support. An equitable and caring community understands and responds to needs of vulnerable populations. This priority ensures that today's and tomorrow's citizens enjoy all that Markham offers as well as a high sense of belonging, despite age, gender, ethnicity, orientation, income, health, and physical and mental ability.



reendrint Sustainability Plan

1. SOCIAL EQUITY

A Community Where All People Can Thrive



Low-Income Households & Persons

INDICATOR

Low Income is measured using the after tax Low Income Cut-Off (LICO), an income threshold below which a family will likely devote a larger share of its income to food, shelter and clothing than the average family. Statistics Canada conducts the calculation for the LICO.

PERFORMANCE

In 2005, of the 68,525 households in Markham, 11.4% of households were low-income households. This compares to 9.8% for York, 15.6% in the Toronto CMA and 8.6% in Ontario as a whole. Also, of the 260,420 residents, 12.6% were low-income individuals.

Source: Statistics Canada, 2006 Census, Prevalence of low income after tax

1.2

Child Poverty

INDICATOR

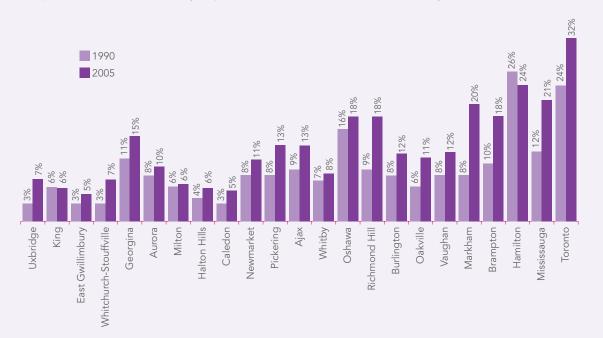
Child poverty is a function of household income and spending. Family income has an effect on child well-being and affects their ability to be healthy, participate in sports and even perform well in school. Child poverty is a calculation prepared by the Children's Aid Society.

PERFORMANCE

20% of Markham's residents 18 years of age and under were living in poverty. In 1995, this figure was 8%. Only Toronto (32%), Hamilton (24%), and Mississauga (21%) had higher rates of child poverty.

Child Poverty Rates 1990 & 2005 - Selected GTA Communities

(Reproduced from Children Aid Society's Report Greater Trouble in Greater Toronto: Child Poverty in the GTA, Dec 2008.)





Low-Income Seniors

INDICATOR

Poverty among seniors is not a rare occurrence, especially in urban areas where most live. Generally, poverty in this group is most common among seniors living alone, women over the age of 80, visible minorities and immigrants. Low income is measured using Low Income Cut-Off (LICO) after tax for persons over 65.

PERFORMANCE

In 2005, there were 26,950 people over the age of 65 in Markham. Of these, 6.9%, or 1,860 people, over the age of 65 were under the Low Income Cut-Off.

Source: Statistics Canada, 2005 Census, Prevalence of low income after tax



Youth Participation in Programs

INDICATOR

Participation in extracurricular activity can be an important source of positive influence in the lives of youth, including inspiring ambition and self-confidence. Positive settings also offer opportunities to resist the lure of problematic behaviours that contribute to truancy, violence, substance use and other forms of crime.

PERFORMANCE

While there are broad opportunities for youth to participate in meaningful activities in a community, only Town programs and services have been measured. In organized (Registered General Programs/direct services and Camp Programs) and drop-in youth programs, 20,242 youth participants were registered in 2008. This represents 0.3 trips / youth (for 0 - 19 years old) or 0.23 trips / youth (for 0 - 24 years old).

Source: Markham. This figure includes total Registered General Programs/direct services (2,821); Registered Camp Programs (577); Drop-in youth programs (16,844)



People with Disabilities

INDICATOR

Understanding the size and specific needs of this community is key to ensuring needs can be met

PERFORMANCE

This indicator has not been measured for this reporting period. There are no known databases recording this information in Markham and/or York region.



Sense of Community Index

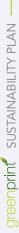
INDICATOR

Sense of Community is defined as a feeling that members have of belonging, a feeling that members matter to one another and to the group, and a shared faith that members' needs will be met through their commitment to be together. It is measured using a survey in which a series of questions are asked, such as "When I travel, I am proud to tell others where I live?" and "I like living in this city" and others.

PERFORMANCE

This indicator has not been measured for this reporting period but can be measured through upcoming Town surveys. The City of Calgary's Sense of Community Index is a credible method.

Markham's citizens celebrate aspects of the community that make it unique and the experiences that bring them together. The community's natural setting, cultural diversity, creative expression and heritage are reflected and celebrated in all its various aspects.





2. Identity & Culture
Unique Sense of Place, Culturally Vibrant & Inclusive

Markham is the most diverse community in Canada, with 65% of citizens being born somewhere other than Canada. One of the Town's great strengths is that it is "a community of communities" where both diversity and harmonious interaction are celebrated. This priority will ensure that Markham's citizens celebrate aspects of the community that make it unique as well as the experiences that bring them together. The community's unique natural setting and heritage are reflected and celebrated in all its various aspects.



2. IDENTITY & CULTURE

Unique Sense of Place, Culturally Vibrant & Inclusive



Mosaic Index

INDICATOR

The Mosaic Index, the number of foreign-born citizens in a community, is recognized as an indicator of openness and diversity.

PERFORMANCE

In 2005, 57% of residents in Markham were foreign born. Markham Mosaic Index of 57% compares to York at 43% and Ontario at 35%.

Source: Statistics Canada, 2006 Census; Total population by immigrant status and place of birth, immigrants.

2.2

Representation of Diversity on Council Committees & Boards

INDICATOR

Visible minority representation at the political and leadership level "sends a message about the accessibility of power in the political system and has significant implications for social inclusion as well as the development of policies that meet the needs of diverse citizens." Given Markham's demographic makeup, representation at the political and committee level is critical for ensuring an inclusive community.

PERFORMANCE

Among the five most diverse communities in the GTA, Markham scored the highest in the % of visible minorities represented on Council (in the 2007 election) with 25% of councillors. In 2009, this changed after a by-election result, to 17%.

Source: Diversity Counts: A Snapshot of Diversity in the Greater Toronto Area, The Diversity Institute in Management and Technology, Ted Rogers School of Management, Ryerson University, 2009.



Major Cultural Establishments per 100,000

INDICATOR

Cultural facilities are cherished amenities in any community that offer opportunities for engaging in creative and learning pursuits. Cultural facilities also play a role in attracting tourists and contribute to the local economy in many ways.

PERFORMANCE

Markham has four formal cultural facilities for programming and services: Markham Museum, Markham Theatre, Varley Art Gallery and the Markham District Historical Museum. 1.5 formal facilities are available per 100,000 in 2009.

When factoring in community centres and libraries (18 total) that offer cultural programming, this ratio changes considerably to 8.5 facilities per 100,000 residents.

Source: Town of Markham





All citizens enjoy physical, mental and spiritual well-being in a community that promotes and is built to support healthy and active lifestyles.





3. Individual Health
A Community that Facilitates Wellness

Sustainable communities promote individual and community health and create opportunities for people to meet their physical, intellectual, emotional and spiritual needs. Strategies and priorities in the Greenprint support and promote active living and healthy lifestyle choices through partnerships with neighbourhood schools, community gardens, and social clubs, with an emphasis on neighbourhood connections. This priority will ensure that all citizens enjoy physical, mental and spiritual well-being in a community that promotes and is built to support healthy and active lifestyles.



3. INDIVIDUAL HEALTH

A Community that Facilitates Wellness



Diabetes & Respiratory Disease

INDICATOR

Chronic diseases and the conditions that predispose individuals to these outcomes, such as hypertension and diabetes, pose a tremendous economic burden and high utilization of the health care system in Ontario, including York Region. Living with disease reduces the quality of life of residents and reduces their life expectancy and social productivity.

PERFORMANCE

In 2007, 6% of the York adult population age 20 and over had diabetes. York Respiratory disease incidence rate – 32.0 per 100,000, which compares well to Ontario (42.2 per 100,000).

Source: Balanced Scorecard 2007, Public Health Branch Community and Health Services Department, The Regional Municipality of York

3.2

Adult Obesity

INDICATOR

Obesity in Ontario is now considered an epidemic; almost one out of every two adults in Ontario was overweight or obese. According to the Chief Medical Officer of Health, the Ontario population has lost the balance between the energy taken in and the energy expended, which is key to healthy weight.

PERFORMANCE

The percentage of overweight or obese adults (aged 18+) in York was 45.8%, which compares well to Ontario's rate of 49.9%.

Source: Balanced Scorecard 2007, Public Health Branch Community and Health Services Department, The Regional Municipality of York



Life Expectancy

INDICATOR

Life expectancy is an indicator that measures the quantity of life and not the quality of life, that is, the amount of life spent in good health. Considering premature mortality and other health indicators, a health-adjusted life expectancy indicator can be measured. In York, this is termed Disability-Free Life Expectancy; this indicator represents the average number of years a person can expect to live in good health.

PERFORMANCE

When last measured in 1999, life expectancy in the York Region was 81.8 years compared to an average in Ontario of 79.32 years. For the same period, York Region's Disability-Free Life Expectancy was 71.1 years. which again was a better performance than Ontario's 68 years.

Source: Health Status Report, 2002, The Regional Municipality of York



Participation Counts at Town Recreation Facilities

INDICATOR

The Town regularly monitors 'people counts' at all recreational facilities (for some facilities, this includes libraries). As an indicator, the 'people count' in and of itself does not consider the activity that was undertaken during the trip. It is nonetheless useful for gauging how frequently citizens engage in healthy activities.

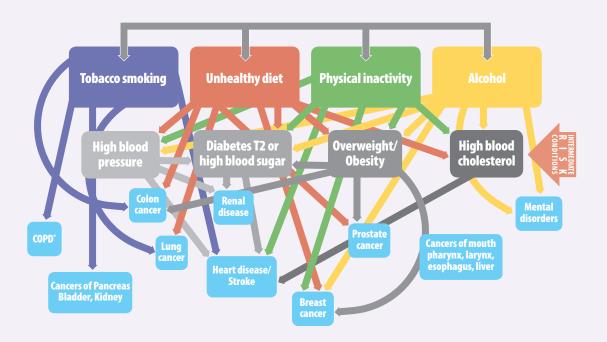
PERFORMANCE

In 2008, 7,033,413 trips to Town recreation facilities were recorded. On a per capita basis, this represents an average of 27 trips per person to a community recreation facility.

Source: Town of Markham, 2009.

Chronic risk factors contribute to many health conditions

(Reproduced from Region of York, 2007)



A range of housing choices accommodates the needs of all income groups, family types and ages in all parts of Markham.





4. Shelter
Housing Choice for All Residents

Appropriate and affordable housing ensures citizens can be productive and engaged in their community and the local economy. At a community scale, a diversity of housing types and tenures defines the quality and livability of neighbourhoods and the quality of life for residents. Also, to ensure a stable workforce and market for goods and services, businesses depend on housing that has access to jobs, mobility options, recreation, schools, open space, amenities and services. All levels of government play an important role in ensuring the provision of non-market housing through incentives, inclusionary zoning, partnerships, housing corporations and special programs. All levels of government and community groups must work together to provide a range of housing options that meet the needs of the community. This priority will ensure a range of housing choices to accommodate the needs of all in all parts of Markham.



4. SHELTER

Housing Choice for All Residents



Housing Type Diversity

INDICATOR

Housing Type Diversity reveals the mix of housing types. Measured on a scale of 0-1, the index indicates no diversity for a '0' value and high diversity for a '1' value. While there is no 'right answer', it is generally accepted that a housing diversity index between 0.8 and 1 will lead to greater ethnic, family composition and income diversity across the community. Greater housing diversity also implies that more homes can be located closer to services, jobs, and amenities, thus decreasing travel distances and costs. Housing diversity also allows for aging in place.

Source: Town of Markham, 2009.



PERFORMANCE

Markham's Housing Diversity by type is 0.64. This is made up of 53% single detached, 15% semi-detached, 18% townhouse and 14% apartment housing.

Housing Tenure Diversity, 2009



Housing Tenure Diversity

INDICATOR

Housing Tenure Diversity reveals the mix of housing tenures available to individuals or families. Measured on a scale of 0-1, the index indicates no diversity for a '0' value and high diversity for a '1' value. Greater diversity in tenure implies there is a broader range of affordable options.

Source: Statistics Canada, 2006.

PERFORMANCE

Markham's Housing Diversity by tenure in 2006 was 0.23 in which the vast majority of homes are owned. This includes 87% ownership, 11% rental, 1% for special needs and rental (geared to income), and 0.2% for emergency shelter housing.



Households Paying More than 30% on Housing

INDICATOR

A common affordability threshold is defined as spending 30% or more of household income on housing costs. Spending more than this can make it difficult to pay for necessities such as food, clothing, education and transportation.

Source: Statistics Canada, 2006

PERFORMANCE

30% of homeowners spend more than 30% on housing, whereas 52% of renters in Markham spend more than this on housing.

4.4

Households in Core Need Housing

INDICATOR

Households in 'core need' housing are those individuals who currently reside in housing that is either in need of major repair, does not have enough bedrooms for the size and makeup of the household, or costs 30 percent or more of their total income, and who are unable to rent an alternative housing unit that meets these standards without paying 30 percent or more of their income.

Source: Town of Markham, 2009.

PERFORMANCE

FORTHCOMING - Via Affordable Housing Strategy

4.5

At Risk Homeless

INDICATOR

A common threshold for being at risk of being homeless is when households spend more than 50% of household income on housing.

Source: TBD

PERFORMANCE

FORTHCOMING - Via Affordable Housing Strategy

All residents have access to affordable, healthy food that is produced locally and in a manner that supports significant local social, economic and environmental benefit.





5. Food Security
Safe, Accessible & Healthy Local Food for All

Safe, accessible and healthy local food includes production, processing, transportation, distribution, retail, consumption, celebration and nutrient recovery. A food system is sustainable if it is energy-efficient, protects ecosystems, enhances the local economy and builds community. Sustainable food systems also build resilience into farming systems and communities, helping residents withstand pressures such as energy and food security crises and development pressure on farmland. This priority will ensure that all residents have access to appropriate, affordable, healthy food, including food that is produced locally.



5. FOOD SECURITY

Safe, Accessible & Healthy Local Food for All



Farmed Land

INDICATOR

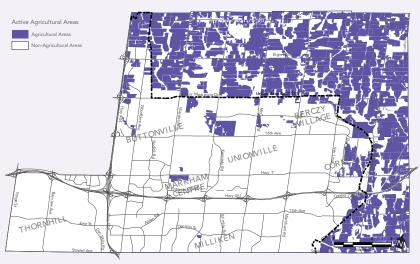
Commercial agricultural land is an essential component of a food system and Markham is blessed with land today. Protecting or even expanding production land supports food security and the local agricultural economy. Monitoring changes in the ratio of farmed land to total land in the Town sheds light on whether a valuable growing area is being protected or eroded.

Source: Town of Markham

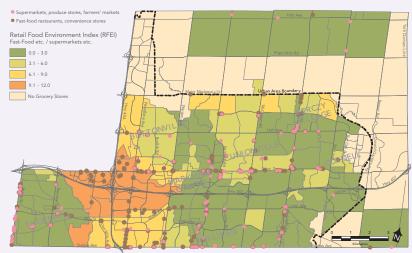
PERFORMANCE

A total of 6,335 hectares of farmed land was recorded in 2009; this represents 30% of Markham. This total includes only farmed land and therefore excludes natural open space within farms. 66% of the land outside of the Urban Area Boundary was farmed compared to 6% of land within the Urban Area Boundary.

Farmed Land in Markham, 2009



Retail Food Environment Index by Neighbourhood, 2009





Community Garden Plots & Community Kitchens per 10,000 People

INDICATOR

Urban agriculture increases the accessibility and affordability of food, helps build community, beautifies neighbourhoods, increases safety through "eyes on the street", provides local food options, and reduces greenhouse gas emissions associated with the transportation of goods and people. Community kitchens provide opportunities for food processing and preparation, thereby building skills and community capacity. This measure indicates the degree to which community sustainable food is incorporated into neighbourhoods.

Source: Town of Markham

PERFORMANCE

In 2005, 90 community gardening plots were in use and no recorded community kitchens for 260,760 people. This represents 3.5 plots and kitchens per 10,000 people.

5.3

Food Bank Usage

INDICATOR

Food banks are an important part of community food security as they provide emergency food services to individuals and families who need them. However, high food bank use rates indicate that a significant proportion of the population requires emergency food access. Monitoring increases and decreases in food bank usage provides some indication of food security and poverty issues in Markham.

Source: 2008 Report on Hunger, York Region Food Network

PERFORMANCE

In 2007, approximately 5,100 users were recorded using the local food bank in Markham.



Retail Food Environment Index (RFEI)

INDICATOR

The Retail Food Environment Index is a ratio describing the relative abundance of different types of retail food outlets in a given area. It is determined by dividing the total number of fast-food restaurants and convenience stores by the total number of grocery stores (defined as a store selling at least fresh produce), including farmers' markets in the area. It measures the availability of healthy foods, and is an important indication of the nature of the local food retail economy. Emerging evidence suggests that access to healthy food in neighbourhoods is associated with a health-promoting diet and that poor access is associated with poor health outcomes.

PERFORMANCE

In 2009, 'unhealthy' food outlets outweighed healthy food outlets by a factor of 2.8 to 1. Markham's 372 fast-food restaurants and 63 convenience stores outweighed the 145 supermarkets, 5 produce stores and 3 farmers' markets, suggesting that it is easier today to access processed and mostly fried food in Markham.

However, fast food is concentrated near employment areas and neighbourhoods are generally well served with a more balanced ratio of grocery stores and convenience/fastfood outlets. All Markham residents enjoy convenient access to all modes of transportation that are safe, connected and equitable for all system users.





6. Access & Mobility
Access, Connections & Safe Choices for All

Traditionally, transportation has been viewed as the movement of vehicles. Communities are now shifting their focus to moving people, not cars, and moving goods and services that support local businesses. Walking, cycling and transit are more affordable mobility options than car ownership, reduce emissions from fossil fuels, and daily activity such as walking and cycling positively affects individual health and social well-being. This priority will ensure that all Markham residents enjoy convenient, safe, enjoyable access to all modes of transportation that are connected and equitable for all system users.



6. ACCESS & MOBILITY

Access, Connections & Safe Choices for All



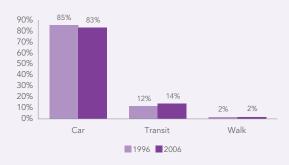
Mode of Travel to Work

INDICATOR

Most of our travel is to and from work. While the personal vehicle is most often the most convenient mode of travel, there has been much focus on improving options for other modes in order to reduce congestion, road investment, improve air quality and therefore human health.

Source: Forthcoming

Mode of Travel to Work



PERFORMANCE

Markham remains heavily dependent on the automobile as a primary means of transportation. In the 1996 – 2006 period, however, transit usage did grow.

Mode of Travel to Downtown Toronto



6.2

Internal Markham Trips

INDICATOR

Markham has traditionally functioned primarily as a bedroom community for Toronto. As a result, most work-based trips originated in Markham bound for Toronto. The Town has been successful in positioning itself as a centre for jobs and is dependent on a regional labour force. Internal trips indicate how many residents live and work in Markham.

Source: Forthcoming

PERFORMANCE

In 1996, 45% of Markham-based trips were internal, meaning that they started and finished within Markham. This has grown to 52% in 2008.



Mode Choice to Downtown Toronto

INDICATOR

Traditional commuting patterns to the region's central business district, downtown Toronto, are expected because continuously improving transportation infrastructure (rapid bus, subway and commuter train) makes it easy to get in and out of the region's heart for suburban residents.

PERFORMANCE

The transit modal split for Markham to Downtown Toronto has been steadily increasing; an outcome of the major investments in transit such as GO Transit, significantly improving service along the Stouffville corridor as well as increased congestion along highways leading into the downtown.

Source: Forthcoming



Transit Trips Per Capita

INDICATOR

Ultimately, reducing emissions will require a major shift to transit usage for many residents, as evidenced by senior government spending on transit infrastructure.

Source: Forthcoming

PERFORMANCE

Forthcoming

6.5

Active Cyclists

INDICATOR

Cycling is a healthy activity as well as a viable mode of travel; cycling infrastructure spending of late should encourage greater use of new cycle routes.

Source: CIHI, 2001

PERFORMANCE

Markham residents that have gone cycling in the past year (2008) – 40%

Markham residents have local access to superior and affordable lifelong learning opportunities, ensuring that skills and education match economic needs as well as meet the human need for creativity.





7. Education & Skills

High-Performing & Empowered Citizens

A community thrives when its citizens have the ability to learn and develop skills, find meaningful jobs and are empowered to realize their full potential. In today's fast-paced and ever-changing world, all citizens require flexibility of skill and knowledge at all stages of life. Having high-performing, engaged and empowered citizens will allow Markham to develop, retain and grow local talent and innovation. This priority will ensure that Markham's residents have access to appropriate and affordable lifelong learning opportunities, ensuring that skills and education match economic needs as well as meet the human need for creativity.



7. EDUCATION & SKILLS:

High-Performing & Empowered Citizens



Resident Employment by Sector

INDICATOR

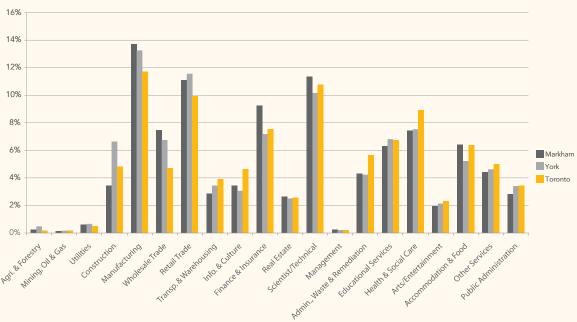
INVESTIGATING IF THIS CAN BE COMPARED TO ACTUAL JOBS IN MARKHAM BY SAME SECTORS

PERFORMANCE

The top 3 sectors in which residents are employed are identical to York's and Toronto's: manufacturing, retail trade and professional. Scientific and technical services account for 36% of the workforce in Markham (35% in York and 32% in Toronto).

Source: Statistics Canada, 2006 Census

Resident Employment by Sector, 2005



7.2

People Without Knowledge of English or French

INDICATOR

No knowledge of both official languages can limit quality of life and success. A 2008 TD Economics Study revealed that newcomers to "Canada are not being utilized to their full potential". Poor language and literacy skills were identified as the major obstacle.

PERFORMANCE

Of the 260,760 residents in Markham in 2005, 18,225, or 7% of the population did not have knowledge of English or French, Canada's two official languages.

Source: Statistics Canada, 2006. Total population by knowledge of official languages (Neither English nor French)



Local Unemployment Rate

INDICATOR

Unemployment is an important economic indicator that tells us about the broader performance of the local and regional economies.

Source: Statistics Canada, 2006 Census

PERFORMANCE

In 2005, the local unemployment rate was 6.7%. York Region's rate was 5.4% and Toronto's was 7.6% in the same period.



Talent & Bohemian Indices

INDICATOR

The Talent Index, the percent of the population with a University certificate, diploma or degree or higher.

The Bohemian index compares the percentage of bohemians in a region to the national pattern. The index shows the concentration of writers, designers, musicians, actors and other arts-related personnel, and is a comparative measure of an area's diversity and cultural amenities.

Source: Statistics Canada, 2006 Census

PERFORMANCE

In 2006, 29.7% of individuals had a university certificate, diploma or degree in Markham. Markham's Talent Index ranks higher than York (26.4%), Toronto (29.5%), and Ontario (20.5%).

Markham's Bohemian Index is 1.0. This is comparable to communities such as Peterborough, Winnipeg, Kelowna, Regina, and Guelph who all have a similar index (within +/-0.125). Canada's top performers are Vancouver at 1.68 and Toronto at 1.45.

7.5

Library Visits

INDICATOR

Libraries offer great local opportunities for lifelong learning and services.

Source: Town of Markham

PERFORMANCE

2,062,000 library visits were recorded in 2008. This represents roughly 8 trips per person.

Percent of Payroll Supporting Employee Development

INDICATOR

Learning also happens informally and formally at the workplace. Major employers measure the percent of payroll that supports employee development. While no 'ideal' percentage has been determined, a 2% payroll investment in employee development has been proven to be an effective amount for meeting the needs of employees.

Source: Town of Markham

PERFORMANCE

Data forthcoming.

Markham has a vibrant, resilient, and sustainable economy that is oriented to local and future opportunities.





8. Vibrant Economy

Create a Community of Choice to Live, Work and Play

A local economy supports job creation through the development, retention and growth of existing businesses and through the attraction of new businesses and investment. Strong local economies include businesses that position themselves for the future by continuously improving. A vibrant economy is also a resilient one, supported by a diversity of business sizes and sectors. This priority will ensure that Markham has a vibrant, resilient and sustainable economy that is oriented to local, global and future opportunities.



8. VIBRANT ECONOMY

Create a Community of Choice to Live, Work and Play



Sustainability Reporting

INDICATOR

A measure of the total numbers of businesses either undertaking public sustainability reporting or showing commitment to sustainability through participation as Greenprint partners.

Source: Forthcoming

PERFORMANCE

Data currently unavailable. Requires research on Markham's companies and likely business surveys. Communities with a business license system can also use the business license application to acquire this information.

8.2

Business Attraction

INDICATOR

The number of new businesses established in the most recent year is a good indicator of job and tax base growth.

Source: Your Local Marketplace, 2009, Markham Businesses Dataset

8.3

Business Retention

INDICATOR

The percent of businesses who have been in the city >5 years is an indicator that helps us understand if Markham is a community in which businesses want to stay, once they've located here.

Source: Your Local Marketplace, 2009, Markham Businesses Dataset

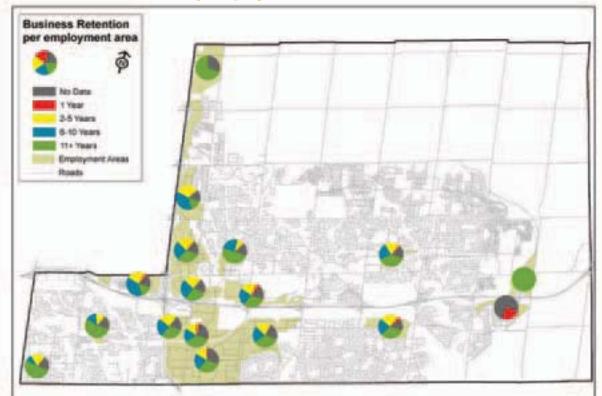
PERFORMANCE

166 (2% of businesses with data indicating year established)

PERFORMANCE

75% of reporting businesses have been at their location for more than 5 years.

Business Retention by Employment Area



8.4

Business Sector Diversity Index

INDICATOR

A high diversity of sectors ensures that the local economy is balanced and resilient.

PERFORMANCE

0.0961 (for this indicator, approaching 0 = more diverse)

By Jobs Per Sector: 0.0994

Note: A word of caution in interpreting diversity: lack of diversity is frequently interpreted as vulnerability. However, in certain cases, especially where diverse business types representing a robust value chain are classed as part of a single sector, then a lack of sector diversity might also be interpreted as regional specialization or clustering success.

Source: Your Local Marketplace, 2009, Markham Businesses Dataset



Business Size Diversity Index

INDICATOR

Business size diversity is calculated using Simpson's Diversity Index where 1 represents infinite diversity and 0, no diversity

PERFORMANCE

0.68

96% of ALL jobs in Markham are provided by businesses with less than 50 employees.

Source: Your Local Marketplace, 2009, Markham Businesses Dataset

Markham will 'decarbonize' its energy and use energy efficiently while maintaining resilience in the context of anticipated and unexpected future climatic conditions.





9. Energy & Climate Carbon Neutral, Responsible & Resilient

The majority of greenhouse gas emissions are from fossil fuels consumed in buildings and vehicles for transportation. Communities have significant control over local land use, transportation patterns, buildings and solid waste disposal, all significant contributors to greenhouse gas emissions. Reducing greenhouse gas emissions through reducing fossil fuel consumption and adopting renewable energy is an important climate change strategy. Designing communities for anticipated climate variability will also add resilience in the system and provide a flexible platform for adaptation to changing conditions. This priority will ensure that Markham will be a net zero emissions community that is resilient in its response to anticipated and unexpected future climate conditions.



9. ENERGY & CLIMATE

Carbon Neutral, Responsible & Resilient



Emissions by Sector

INDICATOR

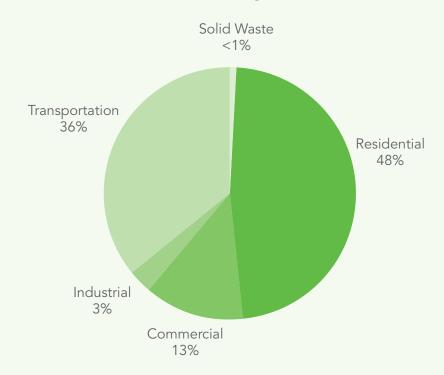
The chart and pie graph below illustrate the sources of emissions in Markham in 2001. Understanding emissions by sector allows us develop targeted mitigation strategies.

PERFORMANCE

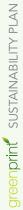
Housing and transportation account for nearly 3/4's of our greenhouse gas output and therefore present the biggest opportunities for reductions. We expect the transportation portion to reduce significantly as a culture of walking, cycling and transit usage develops.

Source: Town of Markham Greenhouse Gas Emissions Inventory and Local Action Plan for Emission Reductions, Final Report Oct. 6, 2008, ICLEI Canada, pg. 17

Markham Greenhouse Gas Emissions by Source



Sector	GHGs (tonnes)	GHGs (%)
Residential	1,054,980	48%
Commercial	300,818	13%
Industrial	68,543	3%
Transportation	811,375	36%
Solid Waste	5,356	0%
Total	2,241,070	100%





Energy Consumption by Fuel Source

INDICATOR

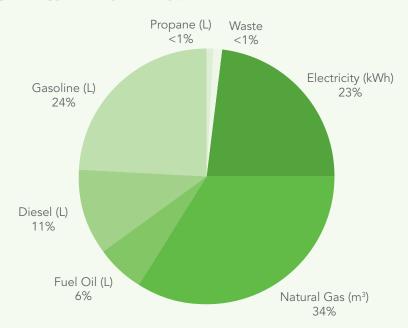
The chart and pie graph below show the split of energy type used in Markham as well as their respective greenhouse gas emissions for 2001. Understanding how much each energy type emits greenhouse gases will help us develop effective mitigation strategies.

PERFORMANCE

Gasoline for transportation and natural gas for space and water heating and industrial processes account for nearly 70% of the Town's emissions, presenting the best targets for reductions. We expect gasoline consumption to reduce dramatically as car use decreases as people reduce the distance between home and work and as vehicle efficiency standards begin to take effect. Additionally, natural gas consumption will begin to decrease as buildings become more efficient, are connected to Markham District Energy and as renewable heat sources are developed.

Source: Town of Markham Greenhouse Gas Emissions Inventory and Local Action Plan for Emission Reductions, Final Report Oct. 6, 2008, ICLEI Canada, pg. 18.

Building Energy Use by Fuel Type





Energy Consumption by Fuel Source con't

Energy Type	Total Use	GHGs (tonnes)	GHGs (%)
Electricity (kWh)	1,965,962,000	519,010	23%
Natural Gas (m³)	413,643,910	777,680	35%
Fuel Oil (L)	45,104,870	127,650	6%
Diesel (L)	92,287,120	252,000	11%
Gasoline (L)	234,251,200	553,280	25%
Propane (L)	3,986,880	6,100	<1%
Waste	-	5,360	<1%
Total		2,241,070	100%



Dollars Spent on Energy

INDICATOR

Current energy prices are anticipated to rise as traditional fuel sources become more scarce and/or more difficult to extract or develop. For a community as large as Markham, this number could be as high as a third of a billion dollars annually (e.g. if 150,000 households spent \$2,400 annually on energy). The Town will work with local utility providers to develop reporting mechanisms for actual costs. Understanding total energy costs facilitates the development of business cases needed for localizing energy production.

PERFORMANCE

Forthcoming





Energy Production by Fuel Source

INDICATOR

The Ontario Green Energy Act intends to accelerate the transition from fossil fuel production to green energy. Markham has shown leadership in localizing energy production (e.g. solar energy) and over the long-term, intends to be an active player in facilitating the shift from non-renewable energy sources to renewable sources. Tracking fuel sources is important for understanding the progress in achieving the Town's goal of carbon neutrality.

PERFORMANCE

Forthcoming



Dollars Earned from Energy Production

INDICATOR

As discussed in the other placeholder indicators, the more energy is localized, the greater local energy-related profits will be. Maximizing this potential will be key to local economic development and energy security.

PERFORMANCE

Forthcoming



Inventory of Vulnerabilities Associated with Changing Climate

INDICATOR

Understanding local vulnerabilities to climate variability and their impacts on the local economy, residents and the environment (e.g. sewers overflow because of more rain, more people are at risk of heat stroke because of hotter summers) is critical.

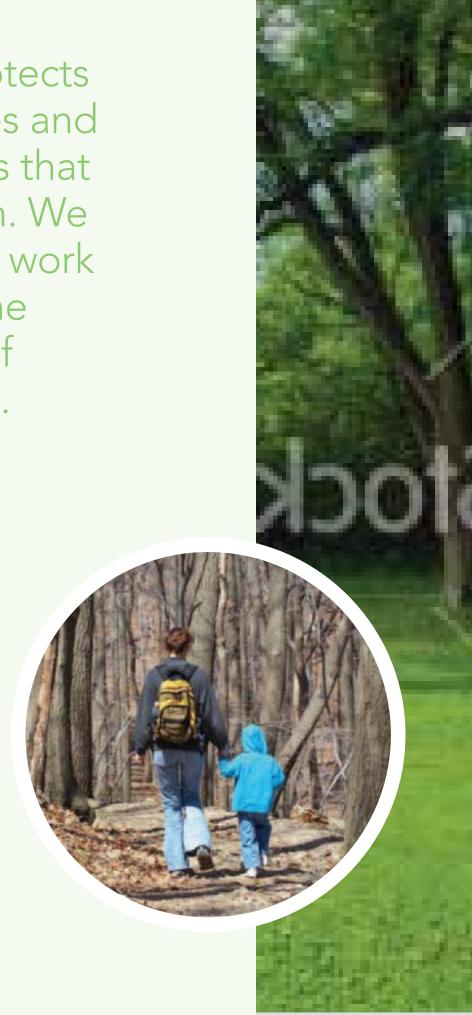
PERFORMANCE

An inventory of anticipated climate change impacts are listed in Table X.X. Vulnerability assessments are provided; assessments are qualitative.

Source: From Impacts to Adaptation: Canada in a Changing Climate, 2007. Natural Resources Canada

An inventory of anticipated climate change impacts is listed in Table X.X. Qualitative "Vulnerability" assessments are summarized in Appendix 2.

Markham protects natural spaces and the processes that support them. We progressively work to increase the naturalness of urban spaces.





10. Ecosystem Integrity Protect, Restore, & Revive Biodiversity & Habitat

Natural ecosystems offer habitat for plants and animals as well as for humans and offer significant 'services', including fresh water, climate regulation, flood regulation, clean air, water retention and erosion control and carbon sequestration. The ability of an ecosystem to function properly so as to support a range of species and to sustain natural functions rests mainly on the existence of larger natural areas and connections between them. Hubs and corridors offer sanctuary and mobility opportunities for animals and humans alike. This priority will ensure that Markham protects, restores and enhances natural spaces and the connections and processes that support them.



10. ECOSYSTEM INTEGRITY

Protect, Restore, & Revive Biodiversity & Habitat



Naturalness

INDICATOR

The extent and quality of the vegetated landscape constitutes the naturalness of a community. Forests, woodlots, meadows, wetlands, lakes, ponds, river systems, agricultural areas, playing fields, parks and developed urban areas (by land use) are identified and monitored over time to ensure there is minimal loss of vegetation.

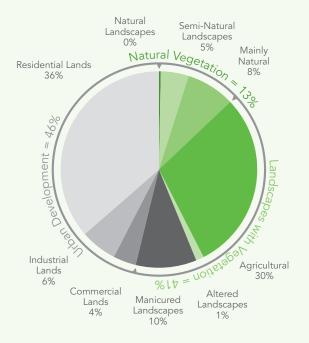
Source: Town of Markham Spatial Data

Source. 10WH of Marking H Spatial Bata

Markham Naturalness by Type

PERFORMANCE

Urban development covers 46% of the community, landscapes with vegetation (cultivated, altered or manicured) cover 41% of Markham. Finally, 13% of Markham is semi, mainly or completely natural.





Ecosystem Network

INDICATOR

Networked natural habitats and ecosystems maintain biodiversity and a healthy environment for the benefit of all living things. Hubs and corridors are essential for a healthy local environment and sustained biodiversity.

Source: Town of Markham Spatial Data

PERFORMANCE

Markham's Natural Heritage Network identifies:

- a connected natural heritage system
- protected woodlands, wetlands and valleylands
- enhancement core areas for biodiversity
- east-west enhancement ecological corridors

10.3

Effective Impervious Area (EIA)

INDICATOR

Local streams require a healthy base flow of cold water to ensure they can sustain animals and plants. Where urban development occurs, there are changes in the hydrologic cycle, such as increased urban runoff, mainly as a result of increase of impervious surfaces and associated loss of vegetation. Minimizing impervious area is critical for healthy local ecosystems.

Source: Forthcoming

PERFORMANCE

This indicator has not been measured for this reporting period. There are no known databases recording this information in Markham and/or York region. The greater the EIA, the greater the chance precipitation is able to infiltrate into soils and recharge groundwater base flow, which in turn, replenishes local streams.

10.4

Urban Canopy

INDICATOR

Urban forests provide significant environmental services such as air quality improvements, uptake and storage of carbon dioxide, erosion control, water recycling, and storm water management and are an important aspect of Markham's green infrastructure system.

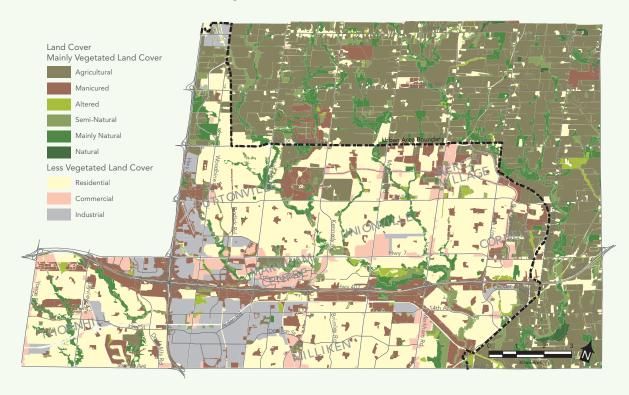
Source: Forthcoming

PERFORMANCE

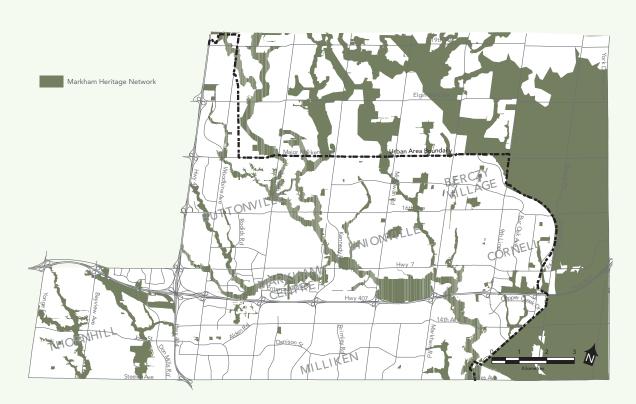
This indicator has not been measured for this reporting period. There are no known databases recording this information in Markham and/or York region. Markham, York Region & other partners are completing an urban forest assessment (UFORE Project) which will quantify and qualify Markham's urban canopy.

greenprint SUSTAINABILITY PLAN

Markham Naturalness by Location



Markham Natural Heritage Network





Markham produces zero waste and creates demand for recycled and reusable materials in all aspects of operations and policy.





11. Materials Management Facilitate a Closed-Loop Materials Management System

To produce the goods we consume, waste is generated in all stages of resource extraction, production, consumption and disposal. Product and technological innovations have reduced the energy and material intensity of many consumer goods. However, the increasing volume of goods that are used and discarded, with the increasing consumer demand, have outweighed many of these gains. Markham is already a leader in waste reduction and management. Markham has the highest residential waste diversion rate of any urban municipality in Canada. Markham has also made efforts to 'close the loop' of material consumption, through material reuse, with innovative practices such as asphalt reuse and requiring green building practices that can include recycled content for some rating programs. This priority will ensure that Markham produces zero waste and creates demand for recycled and reusable materials in all aspects of operational and policy initiatives.



11. MATERIALS MANAGEMENT:

Facilitate a Closed-Loop Materials Management System



Landfill Diversion

INDICATOR

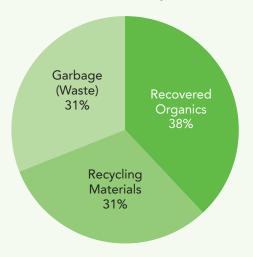
Simply put, discarded material not sent to a landfill does not have to be re-absorbed into the environment as it reused in the production of other products or reused as nutrients for growing food or plants (compost).

PERFORMANCE

Overall, Markham diverted 69% of solid waste from landfills in 2008 — the highest diversion rate in York Region and the GTA. An audit revealed the green bin and blue box programs were not capturing all the materials they could; about 66% of waste sent to landfill could have gone in the blue box or green bin and 27% of the waste could have been diverted through recycling depots and re-use programs.

Source: Town of Markham

Waste & Materials Diverted from Landfill, 2008



11.2

Waste Generation

INDICATOR

Ultimately, humans are consumers and will always have a need to discard materials that result from the use of goods and consumption of food. However, our aim needs to be to reduce the total amount of waste that is produced so that downstream, we are managing less waste materials.

Source: Town of Markham

PERFORMANCE

In 2008, the amount of waste generated and therefore discarded was 75.61 kg per person.



Markham will promote conservation of water by reducing demand and promoting reuse.





12. Water Efficiency
Promote Conservation & Minimize Waste

Water management is influenced by how cities, buildings and infrastructure are designed and paid for and by the decisions residents and businesses make about their water use. Integrated storm water management practices such as bioswales, permeable paving, reusing wastewater and developing an integrated, distributed water system that uses potable water for drinking/cleaning and non-potable water for other uses are all opportunities in the Greenprint to promote water efficiency. This priority will ensure that Markham will promote conservation of water by reducing demand and promoting reuse.



12. WATER EFFICIENCY

Promote Conservation & Minimize Waste



Water Consumption

INDICATOR

The chart below shows potable water drawn from the municipal water system versus the waste water generated per person per day in Markham. Understanding our daily per person usage and waste water generation allows comparison to other jurisdictions and to develop strategies to reduce our use.

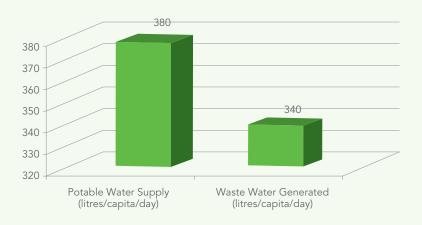
PERFORMANCE

The small difference (40L/ca/day) illustrates that most of the potable or drinking quality water consumed is turned into waste water most likely used to convey waste or for once through cooling processes. This presents a significant opportunity for water conservation and water reuse or recycling for needs where non-potable water can be safely used, like flushing toilets. We expect both water supplied and waste water generated to decrease, with waste water generation decreasing more significantly as we reuse and recycle more water in our system.

Source: Forthcoming

12.1 Water Consumption

Source: Reference: Regional Municipality of York Unit Rates Water and Wastewater Master Plan Update, May 2008, Genivar Ontario Inc. and XCG Consultants Ltd., pgs. 9 and 20.





Cost of Water

INDICATOR

Forthcoming

Source: Forthcoming

PERFORMANCE

In 2008, the amount of waste generated and therefore discarded was 75.61 kg per person.



APPENDIX B

Vulnerability Ratings

- **HIGH** = Not addressed in current plans, standards or services and known to be a risk area.
- **MEDIUM** = Not addressed in current plans, standards or services but not known to be a risk area.
- LOW = Addressed in current plans, standards or services and risk is monitored.
- MINIMAL = Addressed in current plans, standards or services and risk is very low to non-existent.



Table X.X - Anticipated Climate Change Impacts for Markham

	DESCRIPTION OF ANTICIPATED CLIMATE CHANGE IMPACT (based on long-established trends)	VULNERABILITY
Ecosystems		
FORESTS	Remaining remnants of Carolinian forests containing rare and endangered species, such as the tulip tree, black gum, sycamore, Kentucky coffee tree and papaw, are already threatened by urbanization. Temperature stress and new species will threaten existing natural patches.	HIGH
Water Resources	Management	
RUNOFF	Anticipated issues include: decreased annual runoff, but increased winter runoff; earlier and lower spring freshet (the flow resulting from melting snow and ice); lower summer and fall low flows; longer duration low flow periods; and, increased frequency of high flows due to extreme precipitation events	LOW
GROUNDWATER	Decreased groundwater recharge, with shallow aquifers being especially sensitive.	LOW
SOIL MOISTURE	Soil moisture may increase by as much as 80 percent during winter in the basin, but decrease by as much as 30 percent in the summer and fall.	LOW
Transportation		
ROAD DAMAGE	Temperature-related damage to paved roads, snow and ice control, and road damage related to heavy rainfalls and other extreme weather events. Climate variability is expected to exacerbate rutting, thermal cracking and frost heaving of paved surfaces. Freeze-thaw cycles will accelerate road deterioration, particularly in wet areas with a fine-grained sediment subgrade.	LOW



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	DESCRIPTION OF ANTICIPATED CLIMATE CHANGE IMPACT	VULNERABILITY
	(based on long-established trends)	
Human Health		
HEAT STRESS	Rising temperature coupled with the heat-island effects of cities (temperature +3°C warmer than in rural areas) could lead to an increase in 'hot days' (temperatures of 30°C or above); doubling by 2050, and tripling by 2080. In the absence of adaptation measures, this could lead to a proportionate increase in heat-related deaths. Cold-related deaths could decrease by about 45% by 2050, and by 60 to 70% by 2080.	MEDIUM
AIR POLLUTION & RELATED DISEASES	Higher temperatures associated with climate change will increase the potential for photochemical oxidant (smog) formation, and also increase ambient air concentrations of pollen.	MEDIUM
EXTREME WEATHER	Deaths or injuries could result from extreme weather and hazards such as floods, tornadoes and ice storms. Indirect impacts such as injuries from traffic accidents caused by weather and illness associated with the spread of toxic moulds and compromised indoor air quality that may follow flooding of residential and institutional buildings are also anticipated.	HIGH
VECTOR-BORNE DISEASE	Favourable conditions for the establishment and re- emergence of vector- and rodent-borne diseases are anticipated such as the northward expansion of the range for Lyme disease by up to 1,000 km. While malaria is not currently a health concern, future climate will be capable of supporting the mosquito vector species.	HIGH
ULTRAVIOLET RADIATION	Warming will lead to an increase in outdoor activities, bringing an associated risk of greater exposure to ultraviolet (UV) radiation. Related health impacts would include temporary skin damage (sunburn), eye damage (e.g. cataracts) and increased rates of skin cancer.	MEDIUM

(n prin:
	SUSTAINABILITY PLAN

	CLIM	PTION OF ANTICI ATE CHANGE IMP on long-established t	ACT	VULNERABILITY
Flooding (Anticipated Change in Precipitation)				
STORM/ SANITARY SEWER TYPE	COMBINED SYSTEMS	PARTIALLY SEPARATED SYSTEMS	FULLY SEPARATED SYSTEMS	
INCREASED RAIN INTENSITY, SIMILAR EVENT TYPE AND SIMILAR VOLUME	Increased risk of basement flooding. Lower level of service.	Minor impact on peak flows and available capacity.	Minimal impact on peak flows and available capacity	LOW
INCREASED RAINFALL EVENT FREQUENCY AND ANNUAL VOLUME, MINIMAL INCREASE IN PEAK INTENSITIES OR FREQUENCY OF LARGE VOLUME EVENTS	Increased risk of basement flooding. Lower level of service. Potential increase in combined sewer overflow (CSO) volume but reduced frequency.	Increased risk of surcharge and basement flooding. Lower level of service.	Potential impact on available capacity for growth. Increased risk of sewer surcharge and risk of flooding.	MEDIUM
INCREASED FREQUENCY OF LARGE VOLUME HIGH-INTENSITY EVENTS, SIMILAR VOLUME	Minimal impact on system capacity. Increase in CSO volume and frequency.	Potential increase in risk of system flooding. Potential impact on wastewater treatment costs as a result of volume and degraded quality.	Potential impact on wastewater treatment as a result of volume and degraded quality.	HIGH

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	DESCRIPTION OF ANTICIPATED CLIMATE CHANGE IMPACT (based on long-established trends)	VULNERABILITY
Agriculture		
INDUSTRY	The relationship between climate and agriculture is complex, with a wide range of climate parametres influencing crop and livestock production. Generally speaking, Canadian producers think the agricultural industry will continue to furnish adequate technological solutions to meet a variety of risks, including stresses from changing climate and weather conditions.	LOW
TEMPERATURE & RAIN	Farming will increasingly be vulnerable to springtime cold injury. Other potential impacts include maximum and minimum temperatures, growing degree days, length of growing season. The amount and timing of rainfall, extreme weather events, drought, snow cover and frost periods are also expected to be unpredictable and variable.	MEDIUM
PLANTS & WEEDS	Plant diseases will challenge the efficacy of existing plant disease management practices. Also, invasive weed species are expected to show a strong growth response to increased atmospheric CO_2 levels, which may possibly be combined with a weakened efficacy of herbicides.	HIGH
PESTS	Increased migration, reproduction, feeding activity and population dynamics of insects, pests and mites are expected to lead to greater crop losses.	HIGH
LIVESTOCK	Heat stress is expected to result in lower weight gains in beef cattle, lower milk production in dairy cattle, and lower conception rates and substantial losses in poultry production. Climate change also affects animal diseases, and livestock production, by altering the chances for survival and enhancement of insect vectors and associated diseases.	HIGH