

Creating a Regional Climate Change Strategy in Peel



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About the Clean Air Partnership

Clean Air Partnership (CAP) is a registered charity that works in partnership to promote and coordinate actions to improve local air quality and reduce greenhouse gases for healthy communities. Our applied research on municipal policies strives to broaden and improve access to public policy debate on air pollution and climate change issues. Our social marketing programs focus on energy conservation activities that motivate individuals, government, schools, utilities, businesses and communities to take action to clean the air.

Editor's Note: At the time when this report was written, the Strategy was still in development. The Peel Climate Change Strategy was adopted by Regional Council on June 23, 2011, and since then, implementation work has begun and is currently ongoing.

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Forward – Community Adaptation Initiative Case Studies

This case study is one of five produced by Clean Air Partnership for the Community Adaptation Initiative, a provincially funded program through the Ontario Ministry of the Environment that delivers climate change adaptation resources for municipalities. The case studies provide detailed examples of climate change adaptation in Ontario communities. Tailored for municipal audiences, each study examines a program, plan or action with a view to encouraging replication in other municipalities confronting similar challenges. To this end, important data relating to regional background, planning process, challenges and lessons learned have been highlighted.

Climate change is expected to place increased stress on natural, social and built environments. It will also create challenges for municipalities as they work to minimize the impacts of climate change through the development and implementation of climate change adaptation plans. Municipalities must be prepared for increasing variability in temperature and precipitation patterns and increasing occurrences of extreme events such as droughts, extreme heat, storms and other expected impacts. Climate change will place additional stress on infrastructure, planning and social services, environmental conditions and buildings.

Existing municipal efforts primarily focus on mitigating climate change. However, through adaptation, municipalities can implement plans or take action to reduce the more immediate impacts of climate change. This process may involve altering existing policies, or creating new ones that address observed or expected climate changes. Ultimately, adaptive action at this juncture will prepare municipalities for future climate change impacts that threaten their populations, infrastructure and daily operations.



Executive Summary

The Greater Toronto Area, including the Region of Peel, is already experiencing a number of climate change related impacts, with more intense manifestations expected in the future. Several climate impacts such as increased frequency and intensity of extreme precipitation events, varying freeze thaw cycles and increasing temperatures have cross –jurisdictional impacts. The Region of Peel was the driving force behind the creation of the Peel Region Climate Change Adaptation Strategy, a regional planning process that included the Conservation Authorities and municipalities that fall within the geographic region of Peel.

This case study outlines the Region of Peel’s progressive approach to addressing climate change that frames the problem in a holistic manner and engages different levels of government in a coordinated effort. It highlights the benefits of tackling climate change at a regional level, and discusses the specific steps taken by the Region of Peel to foster a collaborative environment and successfully create a regional strategy to better protect constituents from climate impacts.

This case study concludes with lessons learned that may assist other Ontario regions looking to create similar regional climate change adaptation and mitigation strategies.

1 Introduction

1.1 The Peel Region Climate Change Adaptation Strategy

Residents of Greater Toronto Area municipalities are beginning to feel some of the effects of a changing climate in the form of extreme weather events and increasingly variable temperature and precipitation patterns. While there is a growing acceptance that climate change is posing a real and imminent threat to communities, few municipalities are establishing policies to actively address the issue. The Region of Peel spearheaded a partnership with the cities of Mississauga and Brampton, the Town of Caledon, the Toronto and Region Conservation Authority, and Credit Valley Conservation to develop a strategy that tackles climate change impacts at the local level. This Peel Region Climate Change Strategy sets a framework to guide and co-ordinate climate change mitigation and adaptation initiatives among the partners located in the geographic Region of Peel.

It is important to address the impacts of global climate change at the local level, since local features including socio-economic characteristics and the physical environment will determine the extent of climate related risks, as well as the nature of adaptation responses. At the same time, the effects of climate change cross political borders and it is beneficial for neighbouring municipalities to be actively engaged in coordinated adaptation strategies. This makes regional authorities ideal for addressing climate change related issues. This case study explores the processes undertaken by the Region of Peel and its partners in their policy approach to tackling climate change. This multi-partner, multi-level approach recognizes the importance of framing climate change in a holistic way, in which various groups work together to achieve successful policy responses. This case study demonstrates the effectiveness of a multi-party process with a strong leading organization and serves as an example to assist other municipalities in producing their own regional climate change adaptation strategies.

Though the Peel Region Climate Change Strategy identifies the need for both adaptation and mitigation actions and policies, the focus of this case study is climate change adaptation.

1.2 Geographic Context

Peel is a regional municipality located west of the City of Toronto, and spanning from Lake Ontario in the south to Dufferin County in the north. It is composed of three local municipalities including the City of Mississauga, the City of Brampton and the Town of Caledon (see Figure 1). The Region of Peel is home to more than 1.2 million residents in both urban and rural areas (DPRA Environ, Beacon Environmental. 2010a).

Figure 1 Region of Peel



Source: Peel, 2010

The provincial Growth Plan(2006) anticipates that Peel Region will expand to 1.64 million residents by 2031. Based on current population growth trends, Peel is expected to be the fastest growing in the Greater Toronto and Hamilton regions (DPRA, 2010a). Between 1971 and 2006, Peel's population grew by 340%. Between 2006 and 2031, Peel is forecasted to grow by another 42%.

The City of Brampton, located between Caledon and Mississauga, was named the second fastest growing community in Canada in the 2006 Census. Brampton is connected to some of Ontario's most significant environmental features including the Niagara Escarpment, the Oak Ridges Moraine and Lake Ontario. Brampton's 2009 population included 500,700 people and is expected to grow 45% by 2031. Brampton is primarily an urban municipality with some rural areas located in North West and north east of the city. (City of Brampton, 2011)

The City of Mississauga, Canada's 6th largest municipality has experienced strong and steady growth over the last three decades. In 2009, the City of Mississauga contained 728,500 people and is expected to grow 11% by 2031. Mississauga is Peel Region's most urbanized municipality. Mississauga is the only municipality in Peel bordered by Lake Ontario (City of Mississauga, 2011).

The Town of Caledon is largely rural and contains many environmental, agricultural and natural resource areas. These areas are subject to the Niagara Escarpment Plan, the Greenbelt Plan, the Oak Ridges Moraine Conservation Plan, Lake Simcoe Protection Plan and the provincial Growth Plan. In 2009, Caledon was home to 60,400 people and the

population is expected to increase by 84% by 2031. Caledon is primarily a rural municipality, with the exception of the three Rural Service Centers of Bolton, Caledon East and Mayfield West (Town of Caledon, 2011).

1.3 Conservation Authorities

The Region of Peel contains many significant watersheds and is regulated by five conservation authorities. Credit Valley Conservation Authority (CVC) and the Toronto and Region Conservation Authority (TRCA) operate in most of the region. Additionally, portions of the Region lie within the areas regulated by Conservation Halton, Nottawasaga Valley Conservation Authority, and Lake Simcoe Region Conservation Authority. The Region of Peel provides funding to the TRCA, CVC and Conservation Halton under the Conservation Authorities Act and additional funding through a special levy for climate change projects.

1.4 Peel's Natural Heritage System

The geographic Region of Peel encompasses a wide range of biophysical and ecological diversity spanning from the shores of Lake Ontario in the south and including the Niagara Escarpment and Oak Ridges Moraine to the north. Adaptation measures adopted by the Region and partners will need to be cognizant of the natural variations of the Region as a whole.

Forest cover in the region is estimated to be approximately 20.6% with Caledon contributing nearly 85% of that figure (DPRA, 2010a). Wetland cover in the region is estimated to be about 4.2%. The region is also home to numerous species-at-risk and species of regional conservation concern (DPRA, 2010a).

Many of the species in Peel have already adapted to a wide range of temperatures and weather conditions (DPRA, 2010a). The challenge most face will be related to the increasing stresses of habitat fragmentation and urbanization (DPRA, 2010a).

2 Climate Change Concerns in Peel

The Region of Peel and its partners are already observing a number of climate-related impacts, with more intense manifestations expected in the future. These include:

- An increase of annual and seasonal temperatures
- Slight increase in annual and seasonal precipitation
- An increase in the number of extreme heat days
- An increase in frequency and intensity of extreme weather events such as:
 - Ice/snow storms
 - Wind-related storms
 - Concurrent freeze-thaw events, and

- Intense precipitation events

For example, in 2009, the city of Mississauga experienced multiple intense precipitation events in the Cooksville area on August 4th, 9th, 20th, 22nd and 28/29th. The August 4th event caused widespread flooding in the area, while the other events produced limited flooding (Region of Peel, 2009).

Though the Region of Peel includes diverse communities with unique natural heritage and climate vulnerabilities – from waterfront regions such as Port Credit in Mississauga, to high-density urban areas– there are several overarching concerns that necessitate a coordinated regional strategy that has the full attention and support of key partners. General impacts of climate change, including compromised air and water quality, increased number of heat alert days and strained natural resources, will likely be felt by all municipalities, regardless of their location. The effects of climate change may be experienced acutely at regional and municipal levels, yet geographic features such as watersheds, rivers, and floodplains are not constrained within municipal boundaries. The impacts of climate change on these features will similarly stretch past political boundaries, highlighting the benefit of coordination at a regional level that allows partner municipalities and conservation areas to adopt more complementary approaches. For example, a regional plan allows strategies to bridge rural and urban areas, which may be especially crucial for landscape scale decisions like watershed management, where initiatives taken in one area could negatively affect others within the same watershed.

There can also be variations in adaptation planning between bordering municipalities where some may be more advanced than others. A regional plan provides the opportunity to share information and establish a common base level of understanding. It creates a forum to divide the workload, pool resources, and share technical experts and expertise. This can result in coordinating strategies that build off some existing policies and create new policies with support from all partner organizations. The extensive communication required to facilitate a regional plan can also lay the groundwork for continued communication between bordering municipalities, a benefit that could be particularly useful for addressing unpredictable future climate change related challenges.

3 The Peel Region Climate Change Adaptation Strategy

3.1 Existing Climate Change Plans, Policies, and Strategies

As an overarching regional undertaking, the Peel Climate Change Strategy will assess existing policies and programs and identify gaps or areas where regional action is required. Additionally, since each partner differs in their initiation of climate change action and priority areas, the strategy will provide a much-needed consolidated policy, building on work that has been completed, as well as the strengths and capacity of each partner. Figure



2 summarizes the on-going adaptation-related activities undertaken by each of the partners to date.

The purpose of the Peel Climate Change Strategy is to establish a strategic framework that will guide the partners in mitigating and adapting to the effects of climate change using a risk management approach.

As stated within the Adaptation Background Report (DPRA, Environ and Beacon Environmental, 2010a), the partners recognize the urgency of:

1. Acknowledging and exploring the potential impacts of climate change on a local level
2. Developing mitigation strategies to reduce greenhouse gas emissions
3. Crafting short-term adaptation strategies to protect communities from the various risks of climate change and prepare them for potential opportunities

The strategy will address the following sections potentially affected by, or contributing to climate change in the region:

- Human services – which provides services such as child care, long-term care, and social assistance to regional residents.
- Public infrastructure
- Energy
- Transportation
- Natural heritage
- Agriculture
- Public health
- Industrial/commercial/institutional
- Built form (DPRA, 2010a)

As a first step towards a coordinated regional strategy, Peel and partners adopted a five-step risk management approach to the development of a Peel Climate Change Strategy for the geographic region of Peel, as outlined in Figure 3.

Figure 2 Climate Change Adaptation Actions of Peel Region Partners

Plan / Policies / Strategy	Region of Peel ^{xii}	City of Brampton	City of Mississauga	Town of Caledon	CVC	TRCA
GENERAL						
Official Plan Mentions Climate Change	●	●	●	●	N/A	N/A
Environmental Master Plan/ Sustainability Strategy	●	Began in 2009	Starting in 2010	●	N/A	N/A
Strategic Plan Mentions Climate Change	●	●	●	●	●	●
Growth Management Plan	●	●	●	●	○	○
Climate Change Risks and Vulnerability Assessment	○	○	○	○	●	● (in Strategic Plan and undertaken for dams)
Service Strategy Business Plan	●	○	○	○	●	●
Climate Change Outreach and Education Strategy	○	○	○	○	●	●
Business Continuity Plan	●	●	●	●	○	●
AIR QUALITY						
Official Plan Includes Air Quality Policies	●	●	●	●	N/A	N/A
Clean Air Strategy	●	●	●	●	○	●
Smog Alert Response Plan	●	●	●	●	○	●

^{xii} Additional mitigation activities are highlighted in the companion Mitigation Strategies Report

^{xiii} Legend: ● Engaged in activity; ○ Partner not engaged; N/A: Not applicable

Plan / Policies / Strategy	Region of Peel ^{xii}	City of Brampton	City of Mississauga	Town of Caledon	CVC	TRCA
TRANSPORTATION						
Transportation Master Plan	●	●	●	(Selected areas)	N/A	N/A
Transportation Demand Management Activities	●	●	●	●	○	●
Active Transportation Plan	●	●	●	○	○	○
WATER / INFRASTRUCTURE						
Stormwater Management Plan	○	● (in draft)	●	●	●	●
Infrastructure Maintenance Plan	●	● (Updates required)	●	●	●	●
Water Quality Plan	●	●	●	●	●	●
Watershed Plan	(By association)	(By association)	(By association)	(By association)	●	●
Flood Risk Vulnerability Analysis and Plan	N/A	N/A	N/A	N/A	●	●
PUBLIC HEALTH						
Vector Borne Disease Surveillance	●	N/A	N/A	N/A	●	●
Heat Alert Program (Extreme Weather)	●	N/A	N/A	N/A	N/A	N/A
NATURAL HERITAGE						
Natural Heritage Policies (in Official Plan or otherwise)	●	●	●	●	●	●
Official Plan has policies linking natural heritage protection to climate change mitigation or adaption	●*	●*	●	●*	N/A	N/A
Natural Heritage System Strategy	●	●	●	●	●	●
Region of Peel Urban Forest Study	●	●	●	●	●	●
Urban Forest Management Plan	○	○	○	○	○	○
Fisheries Management Plans	(By association)	(By association)	(By association)	(By association)	●	●

Plan / Policies / Strategy	Region of Peel ^{10v}	City of Brampton	City of Mississauga	Town of Caledon	CVC	TRCA
OTHER						
Emergency Management Plans (including Blackout Plans)	●	●	●	●	N/A	● (for own facilities)
Drinking Water Quality Management System	●	N/A	N/A	N/A	N/A	● (for own facilities)
Waste Management Plan	●	●	●	●	○	● (for own facilities)
Climate Change Vulnerability and Risk Assessment	○	○	○	○	○	●
Ongoing Science, Research and Monitoring of Climate Change Risks and Adaptation	○	○	○	○	●	●

* Partner is engaged in this activity but more explicit policy linkages are still required between climate change and natural heritage.

Source: DPRA, 2010a

Figure 3 Risk Management Approach



Source: DPRA, 2010a

The Risk Management Approach requires each partner to complete the five steps in a continuous cycle in order to establish a climate change adaptation strategy.

1. Assess current vulnerability to existing climate hazards, severity of threat, effectiveness of risk reduction, and opportunities for coping
2. Identify vulnerabilities climate change risks in projects, opportunities for long-term change in behaviour and effectiveness of risk reduction strategies
3. Identify what is currently underway in the region and other jurisdictions and develop targeted strategies to reduce impacts
4. Identify opportunities and barriers to adaptation planning; summarize local, regional and national opportunities/requirements for adaptation; establish criteria for a monitoring framework
5. Partner, monitor, and identify short and long term opportunities and continue momentum of planning process
(DPRA et al, 2010^a)

The strategy will be created through the completion of a series of tasks:

Background Research	• Steering Committee Meetings • Project Team Meetings • Background Review • Gap Analysis of Adaptation Initiatives/Programs • Stakeholder Workshop • Action Planning Workshop with Key Staff
Task 2: Establishing the Strategy	• Community and Corporate Greenhouse Gas Reduction Plan • Project Team and Steering Committee Meetings
Task 3: Preparing the Draft Climate Change Strategy	• Preparation of the Draft Strategy • Project Team and Steering Team Committee Meetings • Stakeholder Workshop • Council Workshop
Task 4: Finalizing the Strategy	• Preparation of the Final Strategy • Project Team and Steering Committee Meetings • Council/Board approvals • Public Launch of the Strategy

The Peel Climate Change Strategy¹ was adopted by Regional Council on June 23, 2011. Through co-ordination with area municipalities and conservation authorities, and identification of roles and responsibilities for future action, this adopted Strategy is the guiding document to help Peel and its partners avoid duplication of efforts related to regional climate change adaptation and mitigation initiatives (DPRA, 2010a). Tackling both

¹ now available for download at www.peelregion.ca/climatechange

adaptation and mitigation at the same time was one of the key strengths of this Strategy, one that is not seen in other municipal strategies.

The adopted Strategy, which involved commitment from partners (including conservation authorities, and upper and lower tier municipalities), was a significant undertaking that is unique to the Region of Peel. It is challenging for a regional municipality to co-ordinate efforts with its many municipal and conservation partners, however as the benefits far outweigh the costs, implementation of the strategy will continue in the spirit of collaboration.

3.2 Strategy Development

The Climate Change Strategy evolved out of several high-level strategic documents at the Region of Peel. In 2007, the Region's Corporate Strategic Plan, which contained the Region's vision, goals and actions, was updated, and directed staff to develop a corporate climate change strategy that addresses risks related to climate change.

In 2008, the Peel-Conservation Authority Service Strategy Business Plan (SSBP) was developed in collaboration with CVC and TRCA to coordinate environmental and conservation efforts in the geographic region of Peel. To build a better understanding of existing climate related initiatives, the SSBP established the roles and responsibilities of each party and reviewed past projects that Peel Region and the Conservation Authorities had worked together. Out of this SSBP process grew the objective of developing a climate change strategy not only for the Region, but also more broadly for other levels of government that fall in the Region of Peel. Both Peel and the Conservation Authorities (CAs) agreed to work towards this strategy.

Peel and the CAs then drafted a Project Charter, which was a key component to the success of this strategy, as it lays out all of the details of the project to ensure that the scope of the project, and the guidelines were clear (Sharma, 2011; Kinkead, 2011; Jorgenson, 2011).

Following the creation of the charter, the three municipal partners joined the process, forming the project team and steering committee that was led by the Region. A major asset in achieving the goals of the group was that the Steering Committee included technical experts from each of the partner organizations (Sharma, 2011). The organizations worked over the course of one year to create Terms of Reference, retain a team of consultants, hold stakeholder workshops for Council and attend regularly scheduled meetings. Figure 4 outlines the project process from inception to adoption.

3.3 Partnership and Leadership

The impetus for the Climate Change Strategy at the regional level, and its success to date, has widely been attributed to the significant leadership from within the Region and the Conservation Authorities. At the Region, leadership came from the Chief Administrative Officer (CAO) and the former Commissioner of Planning (Hill and daSilva, 2011). All of the

partners believe that much of the success of the project to date is attributed to the level of dedication and encouragement of the CAO who first brought the conservation authorities on board and later individually met with the lower tier municipalities' highest ranking non-elected officials to encourage their participation (Sharma, 2011; Kinhead, 2011; Jorgenson, 2011). Credit Valley Conservation also noted its Chief Administrative Officer played a significant role in the Strategy's success by ensuring climate change remained on Regional Council's agenda and by identifying climate change as a budget issue (Kinhead, 2011). Beginning in 2007, both CVC and TRCA received increased funding from the Region to pursue climate change related activities (Kinhead, 2011).

Figure 4 Timeline of Peel Regional Adaptation Strategy



Source: Liliana Da Silva, 2011

The participation and enthusiasm of senior officials at the regional level and the dedication to ensuring adoption by the local municipalities undoubtedly helped to ensure this project

gained momentum. Such high levels of management support also made certain that sufficient staff and resources were allocated to the completion of the strategy (Sharma, 2011). Additionally, both the former and current Regional Council is in support of the Climate Change Strategy (Kinhead, 2011).

The project was led by regional staff, and work was primarily completed by a consultant that was hired to complete all three deliverables (the adaptation and mitigation background reports, and the Strategy), with significant support from the project team and with guidance from the steering committee members.

3.4 Strategy Progress

3.4.1 Adaptation Background Report

The Adaptation Background Report prepared by the consulting team of DPRA, Environ and Beacon Environmental provides context and sets the foundation for the climate change strategy with a particular focus on climate change adaptation strategies. It contains information from document and literature reviews, stakeholder workshops, input from partners at a series of workshops and meetings attended by both the Project Team and Steering Committee. This report also summarizes the data compiled as background research (Task 1).

3.4.2 Stakeholder Workshops

Two stakeholder workshops have been undertaken to provide the six partners and consulting team with input on the community's sense of potential impacts and opportunities related to climate change in Peel. Both workshops reviewed actions on mitigation and adaptation, and stakeholders discussed possible responses and identified priorities for action (DPRA, 2010a & b).

Workshop #1

The first stakeholder workshop took place on December 1, 2009 and had a total of 73 participants. Representatives came from a wide range of sectors and shared an interest and/or expertise relating to climate change in Peel. Representatives from each of the partner organizations were also in attendance and facilitated break-out discussion groups (DPRA, 2010a).

The objective of the first workshop was to introduce the strategy to the group and offer an opportunity for stakeholder input. (DPRA, 2010a).

Breakout groups addressed specific themes such as transportation, natural heritage, water resources and public health. Participants in these groups identified current mitigation and adaptation plans and actions, and discussed future impacts, opportunities and actions relating to the sector they represented. Each group was then asked to choose their top three

impacts of climate change and the top three corresponding mitigation and/or adaption actions to further discuss the cultural, environmental, social and economic implications of each (DPRA, 2010a).

The results and input gained from the workshop helped to inform the background research of Task 1 as well as the drafting of the Climate Change Strategy itself (DPRA, 2010a).

Workshop #2

A second, half-day workshop took place on September 1st, 2010, attended by 89 participants. It provided participants an opportunity to review, assess and provide input on the draft components of the strategy. (DRPA, 2010b).

Excerpts from the Draft versions of the Peel Climate Change Strategy were distributed to the participants to promote discussion on the alignment of the strategy with the previously stated goals. A summary of the key messages from the discussion groups is listed in Table 2.

Table 2 Summary of Key Messages from Workshop #2 Breakout Discussions

1.	Advocacy, education and awareness are needed to create a culture shift among residents, businesses, community groups, government and organizations within the Region. This culture shift will drive climate change initiatives and will be part of accepted practices
2	The strategy needs to be tailored to sectors in Peel. Various sectors have different priorities and challenges. Peel and its partners need to identify priorities in each sector and be able to demonstrate climate change impacts to each sector
3	The strategy should identify priorities and partners should focus on these actions and revisit the plan over time. There is no point in having a strategy that is excessively broad
4	Baseline studies must be undertaken by all partners so that we have a starting point from which to measure degree of success of the implementation strategy
5	Targets are needed for both mitigation and adaptation actions in order to provide a means of measuring our success
6	The strategy needs to provide for the engagement of provincial and federal governments in partnerships. These partnerships should focus on exchange of scientific information, research, funding and leadership. These decision-makers should be accountable through monitoring and public involvement. We can help ensure success through effective policies that are properly funded
7	The partners need to develop a regional green economy strategy. This strategy should identify potential green jobs and sectors that should become more green and create green economy indicators
8	Establish a decision making framework that can be used to guide partners' decisions that have climate change implications
9	The implementation of the strategy will benefit from improved communication with the public and between municipal departments. Further, Peel and its partners need to communicate something practical for the public to be involved in

10	The partners need to investigate unconventional funding opportunities to support long-term implementation of the strategy. Suggestions include tax incentives and returns from investing in carbon markets
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Source: (DPRA, 2010b, p. 47-48)

Council Workshop

A presentation to Council members of Draft Climate Change Strategy took place on March 31, 2011. The outcome of this meeting has not been publicly released to date, and as such the authors cannot provide an overview of this component.

3.5 Strategy Implementation

The Strategy is now posted online for download at www.peelregion.ca/climatechange. Following adoption of the Strategy, partners have been working closely to develop a climate change implementation plan. Actions in the Strategy will be a shared responsibility among partners. While some of the actions are led by the Region of Peel, others will be implemented through area municipal environmental master plans.

Responsibility for implementation of the strategy was divided between each of the participating municipalities and organizations (Hill and daSilva, 2011; Sharma, 2011). To ensure that actions are undertaken in a consistent and managed manner, municipal and organizational leaders have been identified. Each leader has been assigned to undertake action items from the Plan that align with their organizations' existing mandate. Supporting roles have been assigned, to develop a multi-level implementation strategy (Sharma, 2011).

Public input, beyond the limited stakeholder engagement, has been relatively small in directing the development of the climate change strategy. More than one interviewee acknowledged that public consultation has been more limited in the initial stages, and that it would be increasing once the implementation aspect began. To encourage future public engagement, a communications working group, consisting of communication representatives from each partner organization, has been organized to oversee the development of educational and promotional materials (Sharma, 2011).

The scale and level of organizational involvement in developing a multijurisdictional climate change strategy is unique in Ontario and so far the process has proven successful as all of the anticipated deliverables are met. The TRCA has already begun to receive calls from other municipalities looking to develop a similar approach (Sharma, 2011). Once the implementation is successfully underway, it may be possible to evaluate the feasibility of transferring this type of strategy to other regions.

4 Challenges

As a complex planning process including many jurisdictional partners, the Peel Region adaptation planning process encountered challenges. This section will explore some of the most prominent challenges that regional level adaptation planning processes face.

Co-ordination

The development of a joint strategy that engages and coordinates multiple partners is a challenging task (Hill and daSilva, 2011; Sharma, 2011; Kinkead, 2011; Peckford and Schmenbri, 2011; Jorgenson, 2011). With each organization or municipality having its own mandate, capacity and workload, ensuring that planning and implementation go smoothly is difficult. This is especially true in cases where action items must be co-executed by more than one organization in order to alleviate issues of mandate or jurisdiction. Because the coordination of partner organizations will become a more prominent issue during the implementation of the actions in the climate change strategy, future coordination issues may occur.

Integration

The Peel Climate Change Strategy was unique in that the initial creation of the document was undertaken by the Region and the two CAs. Implementation of such a strategy requires the cooperation and input of lower tier municipalities, in addition to input of the region and the CAs. Caledon Mississauga and Brampton were incorporated into the process at a later date (Kinkead, 2011). This late stage addition proved to be challenging because it altered the existing group dynamic and complicated the decision making process (Kinkead, 2011). Additionally, integration of 6 different partners into a decision-making and planning process forced the group to accommodate varying levels of commitment and capacity. For example, in the initial joint meetings, absences by lower tier representatives indicated that dedication was lacking in some cases. These absences frustrated planning progress and resulted in lost time and efficiency (Peckford and Schmenbri, 2011; Kinkead, 2011).

Diversity

There were several significant challenges that were faced during the development and implementation of the Region of Peel Climate Change Strategy relating to diversity of the three municipalities. Specifically, the differences in cultural make-up, natural environment and land use between the three municipalities has posed a challenge to the development of a plan that is nuanced to the needs of all municipalities while maintaining equitable distribution of costs. For instance, significant parts of Brampton and Mississauga's population are new immigrants that often place different emphasis on environmental concerns in relation to social, economic or cultural issues. Implementation of climate change strategies in these areas could be delayed or politically questioned and additional time, effort and funding may have to be allocated to environmental education, awareness



and stewardship campaigns in order to mobilize behavioural change and acceptance in the community (Kinkead, 2011; Jorgenson, 2011).

Another challenge was that municipalities had different environmental needs and vulnerabilities to address. For example, the Town of Caledon is significantly more rural than either the City of Brampton or the City of Mississauga, with a large geographic area within the municipality falling under the jurisdiction of the Greenbelt, a provincial designation that limits development in identified areas. Competing mandates (provincial vs. municipal) and climate vulnerability (urban vs. rural), are challenging because each participating member will have different priorities and capacities making the execution of a single, regional plan difficult (Peckford and Schembri, 2011). Tier 2 municipalities within the Region of Peel also have different levels of development within their jurisdiction and struggle with different climate vulnerabilities (Peckford and Schembri, 2011; Sharma, 2011; Kinkead, 2011). The combination of these different lenses has been a challenge in developing an approach that represents and satisfies the interests of all the parties involved.

Differing visions

Several partners noted that challenges emerging in the early planning stages are often associated with setting a common vision, scope and outcome of the project (Peckford and Schembri, 2011). As partners each have their own organizational mandate, setting a common vision and scope that each stakeholder is comfortable with, it often an ongoing struggle. This can frustrate future action as well, since a Climate Change Strategy vision must be agreed upon by each member's council before they will be willing to implement action items. Though agreement on a common vision was not yet reached, the Region of Peel Climate Change Strategy was still able to proceed due to commitment from each of the parties.

Timelines

Given the complexities of undertaking a multi-party/multi-jurisdictional climate change adaptation planning process, the time required for development, input and implementation is often more substantial than if each stakeholder was to initiate the process individually. For example, the original goal was to have the Strategy approved before a new council was elected in the fall of 2010 (Sharma, 2011). However, that timeline proved unrealistic and it took over two years to develop the draft plan. Fortunately, the majority of councillors still support the development of a climate change strategy (Sharma, 2011).

Staff changes

Staff changes within the partner organizations have, at some points, caused minor challenges to the continuity of the process. For the most part, these occasional changes have resulted in slower progress while the new addition is integrated into the proceedings and builds new relationships with other partners and stakeholders (Sharma, 2011; Peckford

and Schembri, 2011; Kinkead, 2011). Given the potential for municipal staff to champion new ideas and programs, staff change can seriously impact the success of the strategy.

Budget & resource limitations

Budget and resource limitations have also proven to be a challenge to many of the partner organizations. Though committed to climate change adaptation and the regional strategy, each partner struggles with financially supporting the endeavour. Staff is expected to be responsible not only for their work on the strategy, but also tasks within their own organizations. Balancing staff workload has been a continuing challenge for the municipal and conservation representatives (Peckford and Schembri, 2011; Jorgenson, 2011; Kinkead, 2011).

5 Lessons Learned

Based on the experiences of the six partners, the following conditions are the key lessons learnt that contributed to the success of the work to date:

Lesson 1: One keystone organization should be responsible for over-seeing and guiding the entire process.

Naming a lead organization and providing a structured timeline for completion of action items is a positive approach. In this case, the Region of Peel worked with partners to develop a Terms of Reference that identified the roles and responsibilities of each partner and the scope of the project. This leadership helped to keep the planning process on track and in line with the goals of the Region.

Lesson 2: Strategy development benefited from an engaged Council, leadership of senior-level officials and willingness of those officials to approach other municipalities to ensure participation.

In a multijurisdictional endeavour such as this, on-going leadership is critical to its success. In the case of the Peel Region Climate Change Strategy, an engaged Council and strong leadership played an essential role in initiating a coordinated regional effort to tackling climate change. This level of leadership has proven to be effective in driving the strategy forward and is essential to ensure long-term cooperation from all partners.

Lesson 3: Limit the number of parties involved to key agencies.

Given the complexity involved in developing and implementing a multi-party, multi-jurisdiction adaptation strategy, partners should be limited to key agencies to promote efficiency. Though public input is invaluable to the process, it must be attained only at key intervals to reduce duplication and inefficiency. The Peel Climate Change Strategy limited



public input to two stakeholder workshops at key developmental milestones. The input received at these workshops directed and framed the regional strategy without sacrificing time.

While working with multiple parties can be a challenge, there are many benefits cited in this case study, including: a richer, more diverse perspective on key issues, workload sharing, the pooling of resources and sharing of technical experts. Because climate change is a large-scale issue, adaptation work at a second tier municipal level may not be as effective as a joint effort that can cross political boundary lines and encourage planning at regional levels.

Lesson 4: Find motivated, knowledgeable and technically-oriented staff willing to attend necessary meetings and achieve the goals in the terms of reference.

From inception to development of the Strategy, knowledge and motivation of staff from partner organizations drove the Strategy to success.

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Appendices

Jurisdictional Responsibilities

The incorporation of the Regional Municipality of Peel was based on the principle that certain community and infrastructure services could be provided more efficiently at a larger scale than could be achieved by individual municipalities (DPRA et al, 2010a). Currently, the Region of Peel is responsible for service delivery related to the following:

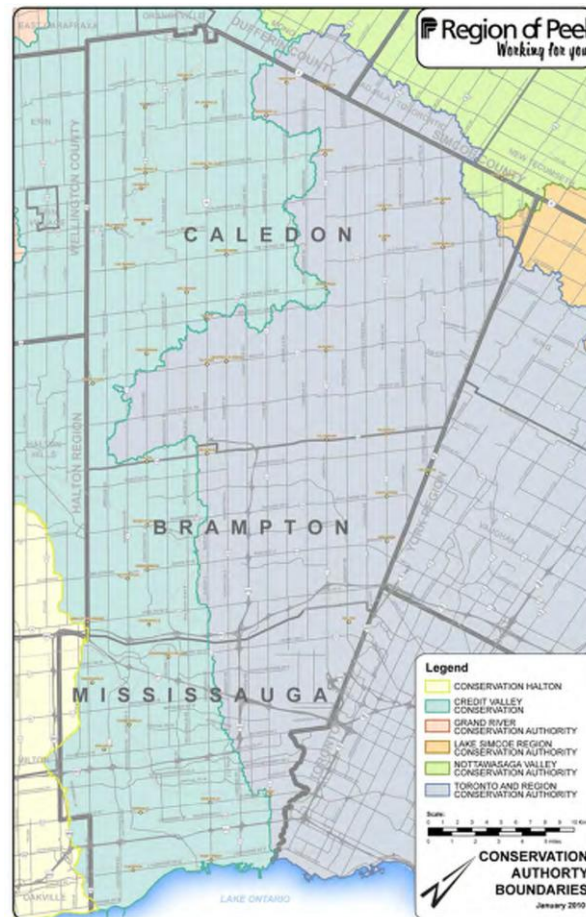
Peel Region Responsibilities	Lower Tier Municipal Responsibilities
Water	Building permits
Wastewater	By-law enforcement
Regional Roads (maintenance, planning, design, construction)	Local Roads (maintenance, planning, design and construction)
Waste management	Transit
Regional emergency management	Storm water management
Regional planning (land use, policy, development)	Local planning (land use policy, development, zoning)
Health Services (public health, long-term care, paramedic services)	Parks and recreation
Human Services (children's services, Ontario Works, social housing)	Culture, heritage and tourism
Regional environmental conservation programs (water, land and energy conservation, protection of the natural environmental environment)	Local environmental conservation programs (water, land, energy conservation, protection of the natural environment)
	Economic Development
	Fire and Emergency Services
	Forestry

Source: (DPRA et al, 2010a)

Peel Region and its Conservation Authorities

Peel Region has signed a Memorandum of Understanding with the TRCA, CVC and the Nottawasaga Valley Conservation Authority defining the role of the conservation authorities in development planning (DPRA et al, 2010a). The mandate of the conservation authorities includes:

- Ensure that Ontario's rivers, lakes and streams are properly safeguarded, managed and restored;
 - To protect, manage and restore Ontario's woodlands, wetlands and natural habitat;
 - To develop and maintain programs that will protect life and property from natural hazards such as flooding and erosion; and
 - To provide opportunities for the public to enjoy, learn from and respect Ontario's natural environment.
- Source: (DPRA et al, 2010a)



Source: Peel Climate Change Adaptation Background Report, 2010, p9

Both TRCA and CVC continue to modify and intensify programs based on the most recent climate change science. The CVC's Greening Corporate Grounds Program and the TRCA's Partners in Project Green are two examples (DPRA et al, 2010a).



Cultural Diversity

The Region of Peel is one of the fastest-growing and multi-cultural regions in Ontario. In 2006, 48.6% of the regional population was immigrants and 46.5% of residents have a non-official language as their mother tongue. Mississauga is the most diverse with more than half its residents born outside Canada in 2006(DPRA et al, 2010a, p 7). Brampton is the second more diverse with 48% of its population comprised of immigrants. Caledon is significantly less diverse with only 21% of Caledon's population considered immigrants (DPRA et al, 2010a, p 7).

The consulting team highlighted the need for the Climate Change Strategy to address Peel's vulnerable populations including seniors, infants, the homeless and residents with health challenges (DPRA et al, 2010a, p 7).