

Community Based
Adaptation in Brampton
Through the Sustainable
Neighbourhood Retrofit
Action Plan



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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.

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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 Sustainable Neighbourhood Retrofit Action Plan (SNAP), a pilot program in the County Court neighbourhood of Brampton, promotes climate change adaptation and sustainability within established neighbourhoods. Led by the Toronto and Region Conservation Authority in partnership with regional, municipal, residential and local business partners, the SNAP program works to implement action plans that involve the community in increasing water and energy efficiency, preparing for climate impact, and promoting behavioural change in alignment with neighbourhood goals and priorities for long-term adaptation and sustainability.

The SNAP program worked with the City of Brampton and County Court residents to assess the neighbourhood's vulnerability to expected climate-related impacts. An action plan was created that specifically targets vulnerable areas and populations. It is currently being implemented in the neighbourhood. The plan works with businesses and residents to provide information and encourage behavioural change to reduce pressure on municipal systems; and with the City of Brampton to retrofit its existing stormwater infrastructure. Under the SNAP program, the stormwater facilities in the neighbourhood will be improved to meet Ontario Ministry of the Environment standards. However, there is also a role for private landowners to support water quality and quantity efforts upstream by undertaking lot level measures such as increasing permeable surfaces, planting climate appropriate trees and flora, and using rain barrels, permeable pavers and rain gardens. To further relieve stress on municipal systems, the SNAP program encourages increased participation in energy and water conservation efforts as well.

This case study describes the SNAP program, explores the process of implementing the program in the County Court community within the City of Brampton, and highlights the cooperative nature of its management and delivery. In addition, it examines the challenges that the SNAP program faced and the strategies that have been used to overcome these barriers. The case study provides an example of local climate change adaptation for other municipalities considering action.

1 Introduction

1.1 Introduction to SNAP Program

The Sustainable Neighbourhood Retrofit Action Plan (SNAP) pilot program in the County Court neighbourhood of the City of Brampton, works to retrofit existing neighbourhoods, helping them prepare for expected climate impacts including: flooding, extreme weather events, increasing temperatures and variable weather patterns.

It is led by the Toronto and Region Conservation Authority (TRCA) in partnership with municipalities and community partners. TRCA is a quasi-governmental agency dedicated to conserving, restoring, and managing natural resources at the watershed level (TRCA, 2006). TRCA is concerned with strategic planning, outreach and capacity building throughout its communities. Formed in the aftermath of Hurricane Hazel, TRCA has a long history in watershed management, and leadership in applying sustainability practices. Their climate change strategy, *Meeting the Challenge of Climate Change: TRCA Action Plan for the Living City*, identifies priority actions for adaptation and mitigation.

By working with community partners, the SNAP program aims to implement action plans that involve community behavioural change and align with neighbourhood goals and priorities for long-term adaptation and sustainability. The County Court community partners include the Regional Municipality of Peel, the City of Brampton, Peel Village Golf Course, Brampton Golf Club, Infrastructure Ontario (formerly Ontario Realty Corporation), Hydro and Gas utilities, Highway 407 ETR and numerous residents and businesses (TRCA, 2010).

1.2 SNAP Program Development

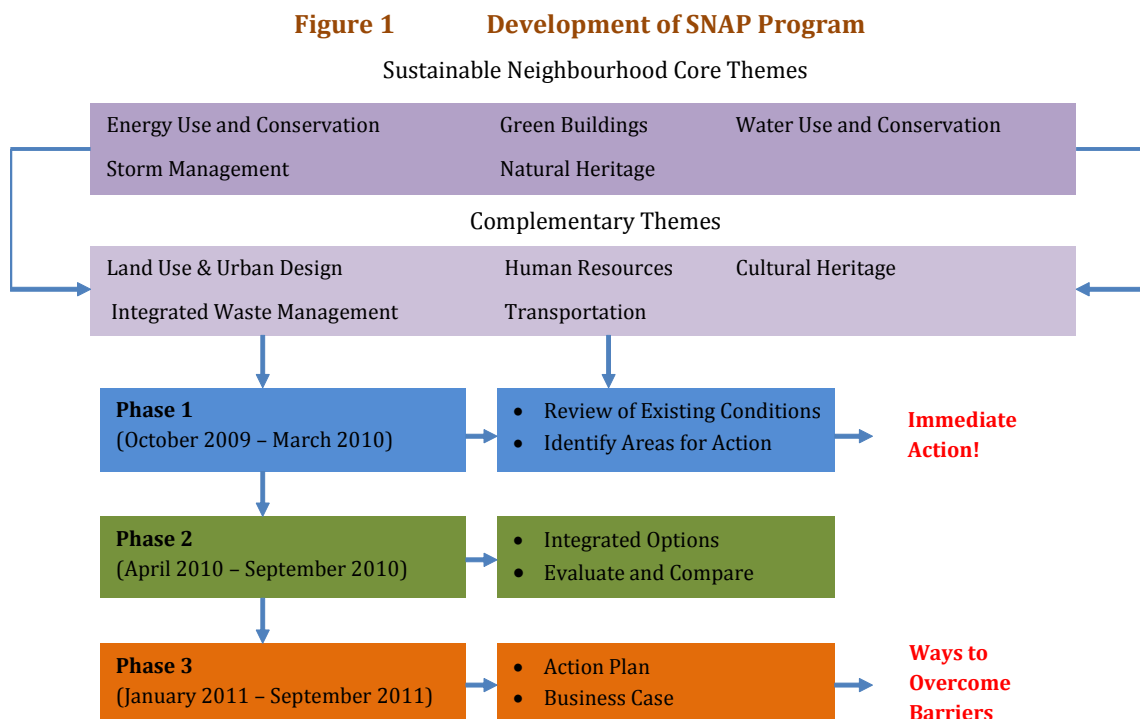
The concept behind the SNAP program evolved from watershed plan updates that TRCA conducted with municipalities. Under the *Oak Ridges Moraine Conservation Act* of 2001, Ontario municipalities were required to begin preparing a watershed plan before April 22, 2003. Each plan would be responsible for the watersheds whose streams originated in the municipality. The recommendations offered in these plans were to be incorporated into the municipality's official plan.

This planning exercise highlighted the potential for linking watershed and municipal official plans. Recognizing an opportunity to promote additional organizational goals, TRCA developed the SNAP program to encourage sustainability and climate preparedness in both municipal and watershed planning, at the community level. This programming was especially needed in established communities. Tools and resources to encourage adoption of sustainable technologies and practices exist for new communities (such as greenfield communities), and for major redevelopments (such as brownfield redevelopment). However, fewer tools exist to promote uptake of sustainable practices in existing, residential neighbourhoods. By taking an integrated partnership approach, the SNAP

program pilots are attempting to fill that gap, focusing on engaging existing neighbourhoods and accelerating the voluntary uptake of practices that contribute to sustainability goals for TRCA and municipalities (Logan, 2010).

The SNAP program produced an action plan to direct short-, mid- and long-term projects; and to organize and facilitate a series of demonstration projects to build awareness and excitement in three neighbourhoods (Logan and Nasmith, 2010). This plan recommended actions to improve the local environment at the neighbourhood scale; and build resiliency against climate change by greening local infrastructure and encouraging positive behavioural changes among residents. Based on the existing conditions in each neighbourhood, the project sets neighbourhood-level targets and identifies key actions on private and public property to address environmental objectives. Quick-start local demonstration projects such as the Green Home Makeover and water-wise demonstration garden engage neighbourhood residents and give them an active role in their neighbourhood improvement.

Because of the size and extent of the SNAP program, it is delivered in three stages (Figure 1): Phase 1 involved a review of the area and identification of need and vulnerability within it. Phase 2 involved a serious examination of appropriate actions and Phase 3 involved the development of an Action Plan and Business Case.



Source: Palka, 2011

As an adaptation program that engages government, businesses and residents to implement adaptation actions at the community level, the County Court SNAP program is a distinctive case study. It includes examples of a successful climate change adaptation action plan,

detailed accounts of challenges, available resources, barriers to change and benefits of co-operative action, to assist municipalities in initiating a similar program in their region.

This case study relied upon many sources for information, including reports, presentations and master plans, as well as interviews with key players involved with the SNAP program.

1.3 Geographic Context

Located west of Toronto and north of Mississauga, the City of Brampton is the second fastest growing city in Canada, with a population growth rate of 6.6% per year. Brampton is a diverse municipality whose population represents 170 ethnic backgrounds (City of Brampton, 2010). Geographically, Brampton is home to the Heart Lake and Clairville conservation areas and has over 4,000 acres of open or park space that it protects through a variety of environmental and conservation policies (City of Brampton, 2010). The combination of Brampton's geographic character, age, demographic makeup and environmental policy made the City an ideal candidate for a community adaptation and sustainability program.

Climate modelling and analysis (undertaken by TRCA during the watershed plan updates) focusing on the Rouge and Humber watersheds, reflected trends in the broader region - including Etobicoke Creek in the County Court neighbourhood. These studies helped to determine which climate impacts would directly affect the neighbourhood, and how the watershed would react to the changes. Additionally, the modelling gave TRCA a sense of the projected impacts on temperature, precipitation, water quality, aquatic biodiversity, air quality and recreational opportunities.

In December, 2008, TRCA, City of Brampton and Region of Peel met to explore candidate sites for the SNAP program. The County Court neighbourhood in Brampton (Figure 2) was selected because it met requirements from all parties regarding water and sustainability goals, strategic plans for the area and demonstrated need. For example, the Upper Nine stormwater retention pond located in the County Court neighbourhood was identified as strategic infrastructure that required retrofitting to meet emerging stormwater needs. Additionally, Etobicoke Creek also in County Court is one of the most degraded watersheds in the region, requiring attention to protect it from emerging climate-related impacts.

In addition to meeting the partners' requirements, County Court was attractive as a pilot community because it represents a typical Brampton neighbourhood - wide streets, diverse population, low density, single family homes (see Figure 3), businesses, and retailers (TRCA, 2010). The lessons learned from this pilot project could be used to inform a similar undertaking in other communities within the municipality.

Figure 2 Map of Study Area



Source: TRCA, 2010

Figure 3 Residential Street in County Court Neighbourhood



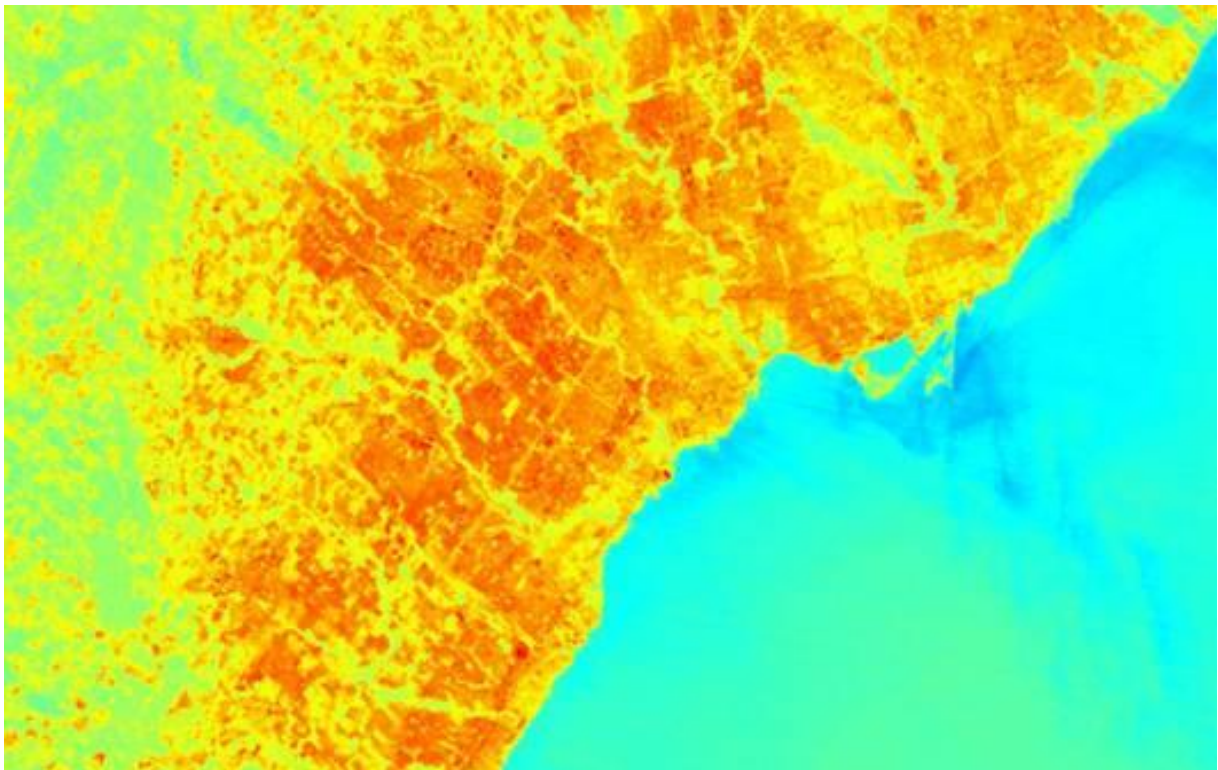
Source: TRCA, 2010

2 Climate Change and County Court SNAP

Like other municipalities in Southern Ontario, the City of Brampton is experiencing climate change impacts. One example is the urban heat island effect, whereby urban areas can be up to five degrees warmer than the surrounding rural areas (See Figures 4 and 5). In County Court neighbourhood, the area surrounding the two golf courses receives some reprieve from the heat; but the residential streets have very little green areas and are prone to extreme temperatures in the summer (Figure 5).

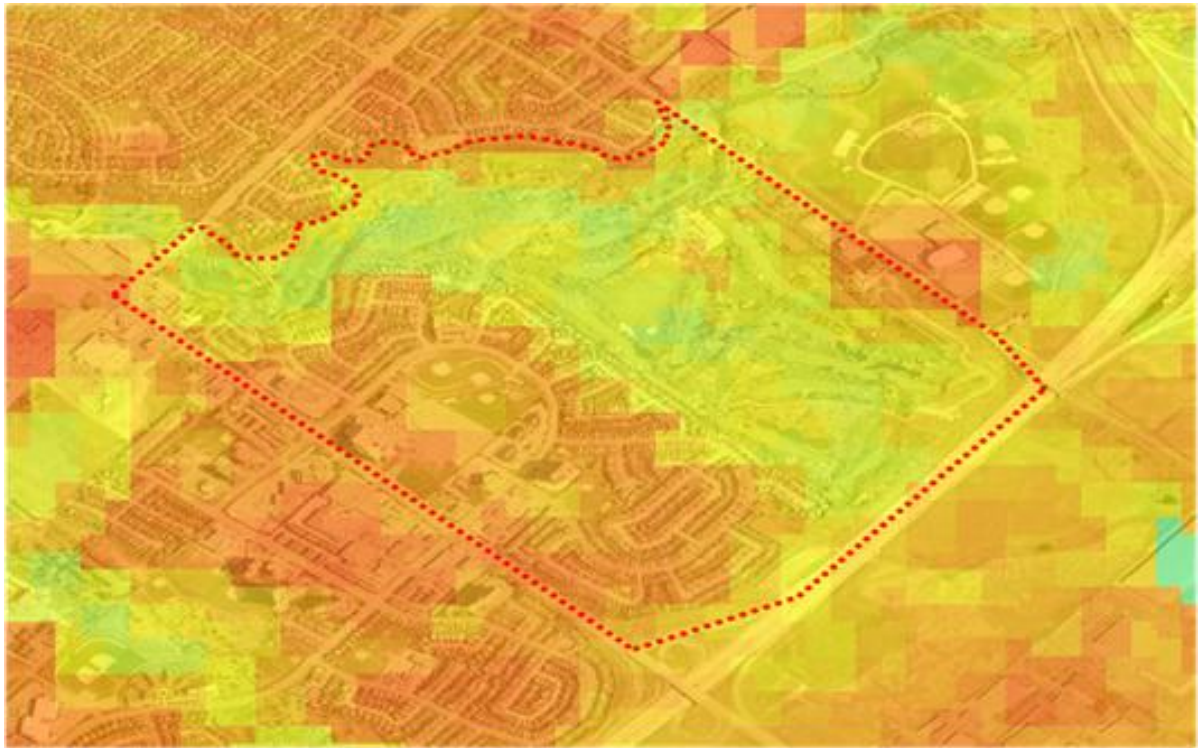
An increase in intense precipitation events also impacts the County Court neighbourhood. Out-of-date stormwater management systems increase the local experience of erosion on public and private land, and poor water quality during intense precipitation events. For example, much of the overland flow in the south end of the community is directed to the Upper Nine stormwater pond. Designed in the 1980s, this pond has been able to accommodate rising stormwater quantity, but cannot cope with issues of stormwater quality or reduce erosion during a heavy precipitation event.

Figure 4 Landsat 7 Thermal Image of Brampton



Source: Natural Resources Canada Earth Sciences Sector and Clean Air Partnership, 2008

Figure 5 **Landsat 7 Thermal Image of County Court Neighbourhood**

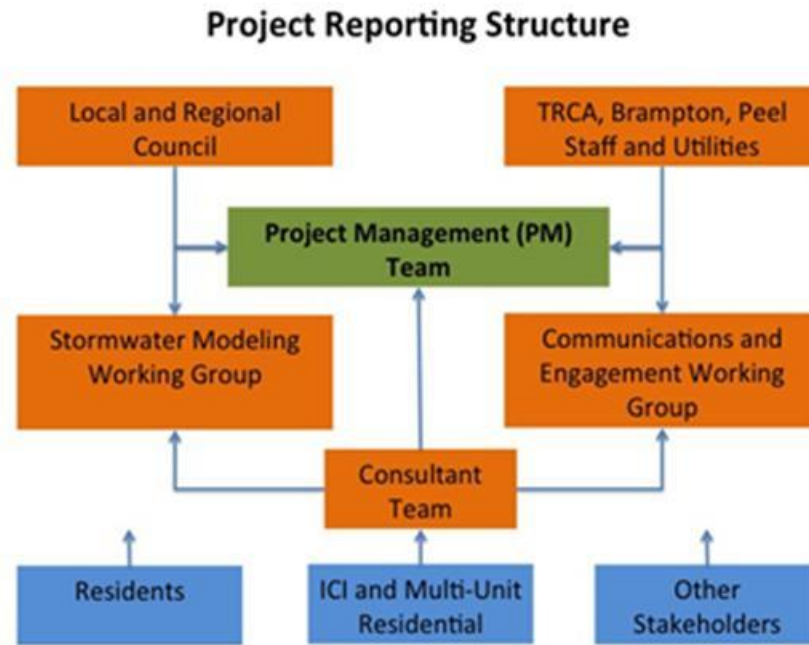


Source: Natural Resources Canada Earth Sciences Sector and Clean Air Partnership, 2008

2.1 The Project Team

When planning the Sustainable Neighbourhood Retrofit Action Plan, TRCA received input from the key players in the County Court neighbourhood. The project management team was formed with representatives from TRCA, the Region of Peel, and the City of Brampton, in addition to representatives from the two local golf courses and technical experts. The composition of this team adds experience in a number of key sectors including multi-level governance, sustainable community planning and social marketing. An expanded group, called the Project Management Team + Friends includes a cross section of government departments and major landowners in decisions about how to engage businesses and residents in climate change adaptation. The project reporting structure can be seen in Figure 6.

Figure 6 SNAP Project Reporting Structure




Source: TRCA, 2010

2.2 Role of the Municipalities

2.2.1 City of Brampton

The City of Brampton has a population of 523,911 and is the 3rd largest City in the Greater Toronto Area. Brampton is also the 5th most diverse City in Canada. In 2010, 40% of residents considered themselves a minority in comparison to only 10% in 1996 (Hoy, 2010). Brampton has numerous older neighbourhoods that are more vulnerable to climate change because of their aging infrastructure and because they have been built to standards that no longer protect them from the impacts of climate change.

The City of Brampton has a variety of green and environmental initiatives such as the Environmental Master Plan (EMP), Community Forest Program and the Flower City Strategy. The City has established the Brampton Environmental Planning Advisory Committee (BEPAC), which involves representatives from City Council, the development sector, business, academic, and public sectors. With BEPAC's support, the City moved forward with the development of an EMP in the fall of 2009. Currently under development, the EMP will provide a long-term direction and a roadmap to ensure that future growth is environmentally responsible and respectful. The EMP will also evaluate the City's current environmental programs and initiatives, look at best practices, and examine gaps in the City's environmental sustainability efforts.



The EMP will also recommend areas for improvement in the following areas: health and safety; corporate operations; programs and services; transportation and transit; community planning; land use planning; urban green space; resource use including energy, waste and water; environmental education and stewardship; and natural heritage system conservation. As part of the EMP, the City conducted an extensive public consultation process in early 2011. The City of Brampton saw the SNAP program as an opportunity to partner with TRCA and implement their environmental sustainability goals in an existing neighbourhood. Additionally, the City was very interested in developing a template that can be used to retrofit other established neighbourhoods at risk.

2.2.2 Region of Peel

The Region of Peel has a population of approximately 1.3 million people and consists of the Cities of Brampton and Mississauga, and the Town of Caledon. Over the next 20 years, the population of the Region of Peel is expected to grow by approximately 300,000 people, with an additional 127,000 housing units expected to be built. Although population and housing growth is expected to continue, a large portion of the housing stock by 2031 will be existing homes. By participating in programs such as TRCA's SNAP program, Peel is able to examine how to best retrofit these existing neighbourhoods and promote sustainability.

With the adoption of the Peel Climate Change Strategy in June 2011, the Region and its five partners, namely the Cities of Brampton and Mississauga, the Town of Caledon, TRCA and Credit Valley Conservation, made a commitment to tackle climate change by reducing greenhouse gas (GHG) emissions (mitigation) and/or by adapting to its impacts. The SNAP program was seen as one way that the partners can address climate change at the local community/ individual lot level (Region of Peel, 2011).

The Region of Peel is a community partner of TRCA and provides funding for environmental sustainability programs like SNAP. Peel has been involved throughout the County Court SNAP by providing information on existing regional programs and identifying how these programs relate to the SNAP program's core themes of water, wastewater, and waste management. By participating in the SNAP program, the Region can also identify what barriers residents must overcome for sustainability and examine how existing programs and services can be improved to better meet residents' needs.

2.3 SNAP Project Phases

The SNAP program builds on synergies with culture, health and wellness, active transportation, waste management and long-term planning efforts to build a more resilient neighbourhood that is protected from climate impacts. The program integrates these goals and challenges into action plans that will achieve the following objectives:

- Better rainwater management that will improve water quality in local waterways and mitigate the risk of flooding
- Increased natural cover to improve wildlife habitat and biodiversity naturalization of parks and creeks to reduce erosion and contribute to natural shading

- Energy conservation in order to reduce the carbon footprint and greenhouse gas emissions
- Reduction in the use of treated municipal water for landscaping and promote wise water use

These objectives form the basis of the three project phases, which were designed to examine the existing environment, develop an action plan and implement adaptation or capacity-building actions in these areas.

2.3.1 Phase 1


As the starting point for the SNAP program, Phase 1 focused on a number of goals including identifying vulnerable areas, developing a framework for action and fostering partnerships within the community. There were several activities that TRCA undertook in order to determine where action was needed. First, a review of current conditions (stormwater, drinking water, energy and ecological factors etc.) was conducted by consultants (Planning Alliance and Lura Consulting), and helped TRCA to gather information on energy and water consumption in the neighbourhood, as well as existing conservation programs. This review also identified a long list of potential short-, mid- and long-term actions. Baseline data on existing conditions, local culture, and existing policies will help future quantitative tracking of outcomes.

After the initial review, TRCA explored opportunities for retrofit and improvement, determining the existing or emerging vulnerabilities, and the priority areas for action. This process highlighted several key areas including natural heritage, stormwater management, energy use, water use and conservation.

The first phase also included extended efforts to engage the community and better gauge their key interests, level of action at home and awareness of environmental issues. Specifically, TRCA surveyed ongoing initiatives and assessed the goals and priorities of the community. This work was primarily accomplished through interviews, surveys, educational workshops and nature hikes, stakeholder focus groups and theme-based discussions at the Language Instruction for Newcomers to Canada (LINC) Centre, located just outside the study area. TRCA also held one-on-one discussions with community leaders and stakeholders (Nasmith, 2009).

The largest undertaking during the First Phase was the creation of a Sustainability Framework, a collaborative effort between TRCA, City of Brampton and the Region of Peel. This framework identified the goal, principles, working targets, indicators and strategies for each sustainability theme based on existing targets and policies of all the partners and will continue to be a working document until the end of Phase 3. The ten sustainability themes are as follows, with the five key themes appearing in bold:

- **Natural heritage**
- **Stormwater management**

- 
- **Water use and conservation**
 - **Energy use and conservation**
 - **Green buildings**
 - Cultural heritage
 - Land use and urban design
 - Human services
 - Transportation
 - Waste management

The framework is a tool that guides the selection of retrofit options to achieve a more sustainable neighbourhood. Throughout Phase 1, the framework was developed based on the results of the neighbourhood characterizations, identification of best practices, input from the neighbourhood and key stakeholders, and a review of relevant policies and frameworks identified by TRCA, City of Brampton and Region of Peel (Planning Alliance et al., 2010).

The goals identified in the sustainability framework informed the identification of retrofit opportunities and early demonstration projects. For each sustainability theme, desired behaviours, potential barriers and benefits were identified based on preliminary findings from the person-on-the-street interviews. Throughout this phase, the team engaged the neighbourhood to begin a primary identification of behavioural barriers to implementing activities on public and private lands (Planning Alliance et al., 2010).

Phase 1 also focused on fostering relationships. The project management team began the engagement process by speaking with community leaders to learn more about the neighbourhood makeup and obtain advice on interacting with residents. Next, the team created a list of potential stakeholders, identifying those who could implement change on their properties and agencies who have existing programs that could support SNAP program implementation. The list included neighbourhood residents, community leaders, businesses and potential partners (such as golf courses and other large landowners).

Person-on-the-street interviews were conducted to determine neighbourhood interests and effective communication methods. Residents were asked how long they have lived in the community, what they value in the community, what elements needed improvement, and what actions they were taking to contribute to the sustainability of the neighbourhood. The interviews were conducted in late November and early December 2009 by Lura Consulting. Overall, they revealed that community members were receptive to the objectives of the SNAP program and helped direct the local priorities for the plan. Census Canada and a Municipal Community Profile database were used by TRCA to obtain a better understanding of the neighbourhood demographic (i.e. languages spoken, average income, age groups, etc.)

Using this information, Lura Consulting developed a preliminary behavioural profile of the community that identified the current behaviours in the neighbourhood that contributed to sustainability.

The stewardship staff at TRCA contributed to the Phase 1 goal of fostering relationships by preparing a neighbourhood newsletter and offering educational workshops, guided nature hikes, and tree planting activities for the community. The educational workshops included a Landscape Ontario Front Yard Makeover Workshop, a Kitchen Gardening Workshop, and a Bird and Butterfly Gardening Workshop. Finally, TRCA stewardship staff kicked-off several demonstration projects to engage the neighbourhood. One of the most important demonstration projects was the Green Home Makeover, which highlighted changes that homeowners could undertake to improve their energy and water efficiency, and protect themselves from climate impacts.


2.3.2 Phase 2

Phase 2 focused on the development of sustainable retrofit scenarios for the County Court neighbourhood, increasing community engagement efforts, and technical analysis to quantify the benefits of various actions and assist in the strategic selection of actions. Scenarios represented a suite of potential retrofit options that could be applied to the neighbourhood in order to increase overall sustainability, raise awareness and heighten preparedness for climate change according to the five core themes. Examples of proposed actions include naturalization and strategic restoration projects around Etobicoke Creek; permeable driveways, parking lots and mixed-use pathways; rainwater harvesting for irrigation and grey water use; bioretention units on city roads to manage and clean stormwater; and the use of insulation to protect against temperature extremes. The goal was to divide retrofit plans into realistic actions assessed by level of difficulty. The scenarios illustrate the level of action required to meet sustainability targets and refine the targets set out in Phase 1. A conceptual list of actions to achieve targets, and general parameters for implementation was drawn from these exercises. The evaluation of scenarios in Phase 2 laid the framework for the County Court SNAP program (Planning Alliance et al., 2010).

Phase 2 community engagement and social marketing research built on the activities from Phase 1 and focused on building awareness and excitement about the project, gathering input on the improvement options, gauging the acceptability of improvement options within the community, and identifying the probability of behavioural change and barriers surrounding each action. The project team conducted action research surveys with residents, workshops, a spring barbeque, and information sessions with landowners and meetings with local champions. Plantings and trail hikes were led within the neighbourhood as well.

Several key strategies enabled successful engagement of the community. These included: engaging households through mail and phone communication; establishing a project website¹; encouraging local champions to invite other community members to events; and clearly communicating the purpose of each event. The family-oriented Eco Day barbecue,

¹ www.sustainableneighbourhoods.ca



promoted with flyers, newspaper notices, and a neighbourhood banner, attracted 60 people. Demonstration projects also seemed to interest people. The Green Home Makeover, a demonstration project designed to highlight retrofit options for homeowners, garnered significant interest as well. At a Green Home Makeover information session, 40 residents attended and there were about 15 booths set up that demonstrated technologies such as solar panels and low flow toilets (Hoy, 2011).

In an effort to secure greater levels of municipal support, increase awareness, and ensure consistency with local and regional goals and priorities, members of the project management Team held presentations and meetings with a cross-section of municipal committees and departments including the Brampton Flower City Strategy Committee, Brampton Environment Community Advisory Panel, Community Services, Works and Transportation. They also conducted one-on-one meetings with local and regional councillors, and relevant department heads from the Region of Peel and TRCA.


To ensure that the actions recommended were strategically sound, the Project Management Team undertook technical analysis in Phase 2. For instance, the team estimated existing and future ecoservices, water and energy efficiencies and stormwater management practices; and conducted stormwater modelling to better understand the impacts of various Low Impact Development actions. This information was then used in conjunction with evaluation criteria that reflected the goals outlined in the sustainability framework. The criteria were used to identify a “short-list” of retrofit activities for the neighbourhood, including early residential, institutional, commercial and industrial demonstration projects.

2.3.3 Phase 3

Phase 3 of the SNAP program began in the spring of 2011 and is currently underway. It focuses on development of an action plan, creation of an implementation strategy, business cases, and a monitoring plan. It will set the stage for implementation of adaptation initiatives and pilot projects. It will target County Court residents by implementing adaptation strategies that are relevant for homeowners; showcasing the Green Home Makeover to residents and renovators; and working with businesses and municipal staff to forward projects like the retrofit of the stormwater management infrastructure, renewal of County Court Park, enhanced urban forest and natural heritage restoration, installation of green parking lots including permeable pavement and green infrastructure, and installation of rainwater harvesting equipment for local golf course irrigation.

One of the goals of Phase 3 is to help create a ‘sense of place’ within the community. Project plans such as the redevelopment of County Court Park can give the community a central gathering spot, a feature currently missing from the neighbourhood. Though this project is still in the development stage, with no proposal yet submitted to Council, the willingness of the SNAP program to address community needs within their larger adaptation goals forwards the capacity building goals of the program.

Several demonstration projects have been completed in Phase 3 including a water-wise demonstration garden in County Court Park. The largest demonstration project, the Green



Home Makeover offered residents the chance to receive a free green home retrofit. The Green Home Makeover, worth an estimated \$70,000, will showcase innovative eco-friendly home improvements and retrofits for single detached homes, educate homeowners and the building industry on new technology installation and maintenance, support monitoring and evaluation of innovative sustainable technologies, provide an on-the-ground illustration of retrofit benefits and connect people with how-to information. A jury comprised of TRCA employees and partners selected one single-family detached home as the recipient of the makeover. The selection process included an application and interview process and a small number of home audits.

The Green Home Makeover is designed to educate neighbourhood residents and demonstrate that there are many environmentally friendly retrofit options to suit all budgets. The goals of this project include: demonstrating the availability of new renovation techniques and technologies, encouraging behavioural changes to protect homes from climate impacts and contributing to ongoing environmental and conservation initiatives. The initiative makes home renovation more accessible and reduces barriers to action for homeowners.

Additionally, the third phase is working to incorporate the use of a community-based social marketing (CBSM) strategy designed to encourage sustainable action on residential properties. Developing the CBSM strategy entails selecting behaviours and audiences to target, confirming barriers and benefits for selected behaviours, strategically selecting behavioural change tools to overcome specific barriers and reinforce the behaviour, testing strategy and materials, and performing full scale implementation and evaluation. The groundwork for this process was laid in Phases 1 and 2. In Phase 3, TRCA will pilot the strategy and implement it at a larger scale (Logan and Nasmith, 2009). The SNAP program can recommend specific behaviours and technologies to residents, but the goal is to make these changes seem fun and positive so that the lifestyle changes continue to occur naturally. Additionally, CBSM strategies can help to nurture community champions that will foster motivation for behavioural change from within the community.

2.4 Next Steps

While community outreach efforts and implementation of select projects (including the Green Home Makeover and water-wise community garden) is currently underway, there are several tasks that must be finished before Phase 3 is complete. These include: finalizing the action plan, creating an implementation strategy, developing business cases and creating a monitoring plan. The Project Management team will continue to work on these tasks with a view to entrenching the program in the community and creating an environment where the SNAP program goals and initiatives can thrive long-term.

The Project Management team continues to finalize the action plan, detailing the final actions required by each partner to complete the program.

Complementing this process, an implementation strategy is currently being developed. One-on-one meetings with key partners will help determine who will continue to be involved in

the program, and sets the stage for ongoing coordination and outreach within the community.

The development of business cases focusing on the Upper Nine stormwater pond, tree planting and curb extensions will help to articulate the benefits of these projects, and make the case for investment.

Finally, because the County Court SNAP program is a pilot project, monitoring and evaluation of key indicators including stormwater, potable water, energy and urban forest are key components as they can help to identify best practices and lessons for implementation in other communities. With respect to stormwater, TRCA staff conducted baseline monitoring of water quality and flow conditions for a selection of catchments in the neighbourhood in 2009. These actions, as part of the Sustainable Technology Evaluation Program, provided a baseline for future monitoring and contribute to the calibration of stormwater models. Future monitoring will focus on targets and progress to identify issue areas and best practices. TRCA is also partnering with university and industry researchers to conduct a program evaluation that will help TRCA to determine how best to reproduce similar programs in other neighbourhoods.

3 Challenges

The County Court SNAP pilot program faces many unique challenges including: participation of multiple stakeholders, competing demands for land, complex community networks, differing cultural priorities and the cost of implementing adaptation actions. Though complex and uniquely challenging, TRCA believes that a neighbourhood approach can provide the most effective and efficient protection for a community facing climate-related impacts. The following section identifies and explores challenges that the County Court SNAP program encountered throughout its progress.

Lack of Neighbourhood Connections

One of the initial challenges that the SNAP program encountered in this particular area was an initial lack of neighbourhood connections. TRCA had no previous experience working in the County Court neighbourhood and a neighbourhood association was not present to facilitate integration and communication with the community. In a program dependent on community participation to achieve goals, neighbourhood, local business and municipal connections are critical stepping stones for success. TRCA staff developed this network by reaching out to community leaders; and by contacting nearby schools, a LINC Centre, and religious centres.

Funding Limitations

Community adaptation actions are so necessary because municipalities have limited resources to proactively address climate change impacts issues. Often, funding only becomes available after the community has experienced a climate event that demands a response. This tendency is a challenge that the SNAP program seeks to address.

Figure 7 County Court, a typical suburban neighbourhood



Source: TRCA, 2010

Engaging Community Members

Engaging community members is one of the most critical and difficult tasks that a local-level adaptation program must undertake. Residents are inundated with environmental messages and environmental concerns and, unless immediately threatening to one's health or family, these messages are often missed. The SNAP program struggled with engaging residents, landowners and business owners. Strategies included educational campaigns designed to heighten awareness of climate-related issues; demonstration projects that allow community members to observe the benefits of change first-hand; and economic incentives for community members and businesses to participate (give-aways at community meetings, planning cost saving and environmentally sustainable plans for businesses etc.).

Differing Needs/Priorities of Project Management Team and Residents

When assessing retrofit opportunities to the County Court neighbourhood, the Project Management Team considered both scientific evidence and local environmental experiences. These considerations led the Project Management Team to promote several activities that were not taken on by the community. The challenge was in aligning neighbourhood goals and interests with the needs determined by scientific analysis. For example, early in the project, TRCA proposed a neighbourhood tree survey, in which residents would be trained to inventory trees in the neighbourhood. However, due to a lack of interest by the residents this was not embraced by the community. The difference between priorities of the neighbourhood and priorities of the Project Management Team can result from a number of factors including cultural values or socio-economic status, among others. Regardless of the cause, if engaging the community is critical to the success of a program, aligning community needs and priorities with those of the project is often one of the largest challenges. The team continues to put a focus on working with the

neighbourhood to create a SNAP program with projects that are both interesting and attractive to residents and also achieve technical objectives.

Physical or Geographic Limitations for Community Adaptation

There are physical challenges that can result from the environmental conditions of the neighbourhood (Ivey 2011, Logan 2011). For example, in County Court, the underlying clay soils are not conducive to some types of stormwater management because they are easily compacted and do not facilitate absorption of excess stormwater. Ordinarily, a key strategy for a comprehensive stormwater plan is to encourage infiltration to reduce runoff. Given the physical limitations of the community, the Project Management Team was forced to seek more appropriate solutions for this neighbourhood and will likely focus more effort on innovative measures such as a district rainwater harvesting systems for the golf courses using rainwater from the neighbourhood, conveyance measures such as bioswales, and increased naturalization and urban forestry.

Demographic Challenges

The demographics of the neighbourhood can present a challenge to program organizers. For example, in the County Court neighbourhood, fifty per cent of the residents were born outside of Canada and speak English as a second language. The neighbourhood is predominantly South Asian with Punjabi being the second most spoken language after English. Engaging the community under these circumstances is a difficult if outreach personal are not experienced in working with the specific community. Community characterization can help identify neighbourhood values and goals; ideal communication tactics; and strategies likely to draw residents out (Coppolino 2011). TRCA staff continues to try to overcome the language barrier. Early on, TRCA led workshop sessions with neighbourhood residents at the LINC Centre where workshops were held to help residents feel comfortable communicating about the SNAP program.

Challenges Specific to Established Neighbourhoods

Existing neighbourhoods bring unique challenges. It is more difficult and costly to retrofit infrastructure in existing neighbourhoods than to build new infrastructure in new developments (Logan 2011, Hoy 2011). In addition, residents in existing neighbourhoods are used to the status quo and may be uncertain about changes to space use (Hatami 2011). One illustrative example is the dry pond in the County Court neighbourhood. The SNAP program intends to re-establish the pond to control the quantity of flow, the quality of the water, and reduce erosion. However, the community has come to use the dry pond as an informal open space for dog walking and a social gathering place. It may be difficult for some residents to accept and adjust to development plans, despite the inclusion of community priorities. It is thus very important to look into innovative ways to communicate the changes and benefits of the retrofit and to involve the community into the planning process.

Scientific Uncertainty at the Local Level

There is a certain level of scientific uncertainty that exists regarding expected climate-related impacts at the neighbourhood level. Climate projections cannot accurately predict

impacts on such a small scale, making it difficult to convince residents and policymakers alike of the need for adaptation. The team uses all local information available, considers larger climate research and trends to make assumptions in forecasting potential local impacts, but overall is looking to create a SNAP program that is adaptive and recommends “no regrets” projects.

4 Lessons Learned

As climate change progresses, more communities are beginning to move from adaptation planning to implementation. This is a difficult process, particularly given the size and scale of required adaptation. Municipal level adaptation efforts may not be sufficient to address the unique needs of a community. Though the County Court SNAP program is not complete, there are a number of lessons that can be identified and may be helpful for other communities interested in implementing similar projects. As observed in the previous section, communities face many challenges adapting to climate change. By highlighting best practices, key players and strategies that the County Court SNAP program used to address challenges, the SNAP experience will hopefully help to ease the challenges that apply to local-level adaptation initiatives, and encourage action from communities around Canada.

Lesson 1: Communicate benefits to the public.


Given that community involvement is essential in a local-level adaptation project, it is important to engage stakeholders early and involve them in planning and implementation phases. The County Court SNAP program demonstrated that the communication of program benefits in early stages through community meetings and demonstration events can help increase awareness of the program, motivate community members and will ultimately contribute to higher participation and community capacity building.

Lesson 2: Get other departments involved.

Budget limitations are often a significant challenge to addressing climate change at the local level. In order to secure the funding needed, cooperation from other departments, the region, municipality and community partners is critical in terms of creating support and momentum for the project. Cooperation is easiest to achieve when all stakeholders feel as though they have an interest in the outcome of the project. For this reason, involving stakeholders in the different stages of the SNAP program, from planning to implementation, helped to secure support for the project, including much needed financial support. The support from the Project Management Team + Friends, has proven to be essential in the success the SNAP program has enjoyed thus far.

Lesson 3: Know the neighbourhood.

At a local or neighbourhood level, intimate knowledge of the political, demographic and geographic characteristics in the neighbourhood can help to reduce confusion, repetition or



failed initiatives. For example, knowledge that many County Court residents spoke Punjabi; or that the area did not have schools, libraries or community meeting places added to the Project Management Team's understanding of what type of initiative would likely be accepted by the community. While this understanding did not eliminate all engagement issues (evidenced by the fact that the tree survey was not adopted by the neighbourhood), it contributed to the community engagement process and helped the Project Management Team to set future goals that were aligned with community values.

Lesson 4: Role of local champions.


Local level adaptation programs are limited in time and funding and must therefore entrench the program into the community to ensure ongoing efforts within the neighbourhood. Local champions can help to maintain momentum and keep residents in their neighbourhood cognizant of environmental and sustainability issues long after the pilot project is finished. This is especially true for initiatives like the Green Home Makeover, where local champions may be able to continue spreading information about adaptation and conservation actions for homeowners, using their personal experiences to encourage behavioural change among their neighbours. Additionally, local champions may help to influence the momentum of larger projects like retrofitting infrastructure by pressuring their political representatives and giving first-hand neighbourhood impacts as reasons for change. As part of the community, champions can often rise above the suspicion that municipal employees or external professionals would face from businesses and residents, and can help future adaptation efforts by providing a much needed link within the community to overcome issues of culture, language, and distrust.

Lesson 5: Importance of constant evaluation.

The SNAP program has many projects within it including the Green Home Makeover, retrofit of the Upper Nine stormwater pond and County Court Park, installing permeable pavement in parking lots and parks, obtaining rainwater harvesting equipment for golf courses, and planting climate appropriate trees in neighbourhood parks. Under such a program there are numerous lessons to be learned, technologies being implemented and networks being developed. The most effective way to identify best practices and prepare such a project for transfer to other municipalities is to constantly evaluate the progress and goals of the program. This process can help to determine the forward progression of projects, challenges, suitability of the program for the neighbourhood, benefits derived by the community, and areas where improvements can be made. In the SNAP program, this type of monitoring and evaluation has helped to hone the networking and delivery processes and will ultimately make it a more successful and useful program.

Lesson 6: Sustainability framework as a starting point.

The sustainability framework was a key component in defining the concept of a SNAP program. The sustainability framework is intended to act as a tool to guide the development of the SNAP program. The framework was developed early in order to bring forward relevant policies, goals, best practices, and indicators. It is also useful as a framework for monitoring future conditions and local change. The framework will evolve as the neighbourhood changes in order to ensure that strategies respond to local challenges and



needs and provide results. The framework reflects the main technical strengths of TRCA and partners – relating to water cycles, natural heritage and environmental sustainability.

The SNAP Project Management Team has found that neighbourhood residents are often most interested in the social and economic aspects of sustainability. They have sought to determine what the key pressing socioeconomic factors are, and how to integrate them into the SNAP program, so that project partners can deliver programs that interest local residents. The goal of the sustainability framework is to bring in strategic level, big picture aspects from watershed planning and translate these objectives into neighbourhood scale actions. TRCA can compare and evaluate sustainability practices that way. Indicators and targets were refined in Phase 3 and will lay the groundwork for monitoring progress.

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