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# Adaptive Planning and Climate Focused Evaluation in an Era of Evolving Local Governance

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Adaptive Planning and Climate Focused Evaluation  
in an Era of Evolving Local Governance

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Master of Planning

in

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# **Adaptive Planning and Climate Focused Evaluation in an Era of Evolving Local Governance**

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Master of Planning in Urban Development

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## **ABSTRACT**

The interconnected relationship between cities and global climate change has led to the creation of a growing number of municipal climate change adaptation plans. Currently, there exist relatively few well known criteria on the best ways to evaluate these documents following their implementation.

This study begins with a review of evaluation literature and policy reports drawn from four principle agencies considered to be at the forefront of climate change adaptation planning in Canada. Findings are then used to explore how the Cities of Toronto and New York have successfully incorporated evaluation criteria into their adaptation plans. Lessons are presented for both planning practitioners and local governments concerning the implementation of successful climate-focused evaluation criteria. Overall findings suggest that numerous tools exist for evaluating adaptation plans including important performance-based approaches. Agency commitment and persons assigned to conduct the evaluation as well as integration into an ongoing planning process were also found to be key success factors while evaluation outcomes were found to reflect the resources and expertise available given the present voluntary nature of climate plans.

Key words: adaptation; planning; evaluation; climate change; metropolitan area



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## Introduction

“The world is increasingly organized into cities. As a result, urban designs, technologies, infrastructures, and governance make a growing contribution to the structure of societies” (Brugmann, 2012 P.1). This is important because over the past one hundred years Canada has gone from a rural hinterland to a highly urbanized nation with over 80% of the country’s population now living in urban areas (Statistics Canada, 2011 P.1). In Canada’s urban regions, statutory legislation fashioned by the Provinces provides the ground rules for land use planning including the requirement for municipalities to prepare official plans and related planning policies to guide land use and future development. While local governments must continue to look to regulations like the Ontario Planning Act to regulate and plan development within their communities, they are progressively undertaking complementary or additional planning exercises in a range of areas including the creation of integrated community sustainability plans and local climate action plans intended to bolster their communities’ contributions, resilience and response to the impacts of a warming climate.

As the complexity of issues to which local government must respond continues to expand so too does the science surrounding global climate change and a realization that its local effects are becoming more apparent in everything from increased frequency of severe weather events to abnormal temperature fluctuations (ICLEI, 2009). Furthermore, there continues to be an interconnected relationship between urban areas and climate change including the fact that municipalities are vulnerable to climate impacts while local governments also have direct or indirect control over approximately 52% of greenhouse gas emissions and responsive tools including local land use planning, building approvals, and utility systems (Robinson and Gore, 2005). This interconnected relationship and a realized need for action have driven communities to introduce climate oriented techniques and principles into both their statutory and non statutory planning frameworks. Such information can now



be found in a growing number of municipal Climate Action Plans (CAPs) containing both mitigation and adaptation strategies for responding to the effects of climate change at the local level.

### **Planning in the Face of Climate Change**

While mitigation strategies continue to be needed to reduce the magnitude of climate change, local governments are now acknowledging that additional adaptation strategies are crucial to address impacts that cannot be avoided (ICLEI, 2009). Many municipalities are now beginning to see the need to begin or also focus on assessing their vulnerability and developing strategies to protect their communities from the inevitable effects associated with a changing climate (Ibid). Increasingly, these strategies constitute ever growing portions of Climate Action Plans, which remain a central tool for addressing the interconnected relationship between cities and a changing climate.

Proactive adaptation strategies which incorporate climate change impacts and considerations into local government planning processes can significantly reduce both the long and short term risks while also helping to achieve other municipal planning and policy goals (NRCAN, 2009). Such strategies typically include a range of actors and work to incorporate climate change adaptation techniques into traditional plans, policies and regulations including land use, infrastructure, resource management and other guiding documents through the use of a strategic climate change adaptation plan (Ibid). Local governments continue to invest their resources in the development of these strategic adaptation plans and therefore need to know if the documents they are creating are of the highest quality and will achieve their full potential.



## **Role of Evaluation in Climate Action Planning**

While the planning profession is in the early days of expanding the scope and scale of its activities with the creation of new types of climate focused adaptation plans, there exist relatively few well known criteria on the best ways to evaluate the success of this diverse range of documents after they have been implemented. Indeed much of the focus on evaluation to date continues to be on traditional policies, programs and land use plans implemented over short and moderate time horizons.

Today, the question of “what makes an effective adaptation plan?” is both more complex and more important than ever before given that climate science is continually evolving and localized effects of a changing climate can no longer be ignored. With this notion in mind, this project will ask and answer the following research questions: Now that some Canadian local governments have created Climate Change Adaptation Plans, what follows their implementation? Is evaluation of these types of documents and the action they inspire truly embedded in the planning process or merely mentioned as an afterthought? And, climate change adaptation goals and strategies can take a long time to implement; do positive examples exist of when and how these outcomes have been evaluated and if so, what resources do local governments need to evaluate their climate adaptation plans effectively?

## **Method**

To answer these questions this study will provide a secondary review of relevant evaluation literature as well as an overview of policy reports drawn from four principle agencies considered to be at the forefront of municipal climate change adaptation planning in Canada: The Canadian Institute of Planners, Natural Resources Canada, The International Council for Local Environmental Initiatives and the Clean Air Partnership. Findings from the literature and policy review will be subsequently applied in an analysis to explore how the Cities of Toronto and New York have successfully incorporated evaluation criteria into their municipal climate change adaptation plans including a review of the timelines,



methods and the resources needed to measure the success of these documents. New York's 'PlaNYU' 2030 and Toronto's 'Ahead of the Storm' climate change adaptation plan along with supporting materials have been chosen due to the fact that these cities continue to represent some of the most progressive and complex examples of urban municipalities working to address the effects of climate change at the local level.

Based on observations from these plans along with the literature and policy review, this study will present a final snapshot of how communities can use planning principles under an expanded mandate to evaluate the success of their climate change adaptation strategies. Lessons will be derived from these examples as well as a series of best practice policy recommendations from implementation of successful climate-focused evaluation criteria in some of North America's most complex urban regions.

## **Literature Review**

The first part of this study contains a literature review. The review of evaluation is structured in three parts: first we attempt to define evaluation and provide an analysis from program management perspective; next an analysis is presented of evaluation theory and methods from an urban perspective covering traditional plans for cities which remain a central focus of the work many planners do; Finally an overview of contemporary evaluation from an integrative perspective is provided with a specific focus on strategic planning and a relatively new field of local government planning practice, the development of Climate Action Plans (CAPs) which contain both mitigation and adaptation strategies.

The analysis of evaluation from a program management perspective starts with a synthesis of lessons learned from the work done by administrators in understanding and addressing the gap between objective and outcome. The second part of the literature review focuses on research which specifically takes into account the physical and spatial development of cities and to what extent plans



meant to guide future urban development are being evaluated. In the final sections, we analyze literature surrounding evaluation in strategic planning with a focus on municipal CAPs to understand the state of practice surrounding these documents and the extent to which methods are being utilized to assess their quality and effectiveness.

### **Evaluation from a Program Management Perspective**

An in depth review of the literature surrounding evaluation quickly illustrates that there is no agreement among scholars about what the action of evaluation really is. Definitions of evaluation from a program management perspective can range from: a process of obtaining and providing useful information for judging decision alternatives; a process for comparing actual effects of a program to demonstrated needs and/or a systematic assessment of the operation and/or outcomes of a program, compared to a set of explicit or implicit standards, as a means of contributing to the improvement of that program (Weiss, 1998). Lincoln and Guba (1986) provide a comprehensive definitions of evaluation by stating: “Evaluation is a type of disciplined inquiry undertaken to determine the value (merit and/or worth) of some entity- such as a treatment, program, facility, performance, and the like- in order to improve or refine the focus (formative evaluation) or to assess its impact (summative evaluation- Lincoln and Guba, 1986 P. 18). Here Merit refers to measuring the desirability in terms of achievement of program goals while ‘Worth’ measures such benefits relative to alternative solutions (Springer, 2012).

The concept of evaluation is certainly not new, for decades evaluation procedures have been concentrated in areas surrounding human services delivery by state and national governments based on the fundamental idea that social programs should have demonstrated benefits (Rossi and Berke, 2000). Nagel (1998) tells us that in part, government focus on evaluating public programs arose from the policy problems of the 1960s and the development of new methods of evaluation (Nagel, 1998). In Canada, program evaluation officially came into existence in 1977 with the issuing of a Federal Government



policy mandating program evaluation across all departments, although much of this work was already being conducted by federal departments well before this time (Mayne et al, 1985).

The increased emphasis on government accountability in recent decades has shed new light on program evaluation techniques as politicians and civil servants have had to become more aware of how program activities bring about desired outcomes (Milliar et al, 2001). In the United States much of the move toward accountability was fuelled by the Federal Government Performance and Results Act (GPRA) which focused on the 'black box' between inputs and outputs requiring public agencies to demonstrate how they achieved results (Ibid). Government departments have had to not only be more accountable for their expenditures but also put in place strategies to improve performance, such as program evaluation (Ibid).

Since the 1970s evaluation techniques evolved into a complex system of 'evaluation research' the subject of which there is a seemingly endless amount of literature and resources available (Rossi and Berke, 2000). According to scholars, evaluation research can include the design of assessment ready social programs to impact assessments and the analysis of comparing program benefits relative to their costs (Ibid). Nachmais (1980) further divides the assessment component of evaluation research into two fundamental categories: 1. Process Evaluation- the degree to which a particular program is being implemented according to its original intent and has not been revised and 2. Impact Evaluation- assessing the extent to which a program has produced a change in a target population and achieved its objectives to the extent required by program administrators (Nachimas, 1980).

One of the most well known process evaluation techniques found in the literature is the use of logic modeling and related analysis (Brouselle and Champagne, 2011, Milliar et al, 2001, Cooksy et al, 2001, Julian, 1997). Logic modeling allows evaluators to understand the casual path required to turn the goal of the program into a reality and validate the construction of a program intervention using available



scientific evidence or expert knowledge (Brouselle and Champagne, 2011, Clean Air Partnership, 2009). Logic models start with the inputs of the program and work their way through the processes to end up with the desired outcome (Milliar et al, 2001). For example one of the goals of the Greater Toronto Area Clean Air Council (GTA-CAC) was to convene an expert forum to explore potential strategies to promote clean air in the GTA. In their logic model a number of subsequent steps to achieving this goal were outlined including strategies and activities that the GTA-CAC would undertake, as well as organizational deliverables and immediate outcomes all directed toward ensuring over the long term that such a forum was established (Clean Air Partnership, 2009).

Lesser known evaluation techniques include impact based summative program evaluations conducted after a program has been expected to achieve its intended results, mixed method evaluations using qualitative and quantitative methods used to measure specific program indicators and theory driven approaches which attempt to examine data from different evaluation methods under a single theoretical framework (Smith, 1990, Cooksy et al, 2001). Numerous other approaches also exist in both process and impact evaluation and endless combinations thereof depending on the context in which the evaluation is being conducted; to mention them all would be beyond the scope of this study but in general these techniques aim to measure relevant indicators and compare program outcomes to the original objectives that the program was intended to achieve.

One major way in which program evaluation methodologies differ from one another is in the person(s) assigned to conduct the evaluation. For example logic modelling is usually undertaken by external evaluation specialists with input from program staff while summative evaluations are often be done in house by program managers directly evaluating their own program (Cooksy et al, 2001). Stakeholders can also play a key role in program evaluation especially for those processes which involve a participatory component (Nichols, 2002). The literature suggests that the decision to assign internal or



external evaluators can also depend on a number of other factors including time, money, staff resources, legislative requirements, and type of evaluation being conducted.

In addition to assigned personnel, the timing of the evaluation in the implementation process was found in the literature to also play a critical role in program evaluation. Numerous authors cite the need to build evaluation measures from the initial program planning phases onward. Smith (1990) and Cohen and Cohodes (1985) outline the concept of 'evaluability assessment' whereby in a program's initial stages it is pre-assessed to determine whether evaluation is likely to be useful in improving performance (Cohen and Cohodes, 1985). Cohen and Cohodes (1985) explain that evaluators often have to evaluate programs under severe resource and time constraints and so program design may severely limited evaluability (Ibid). "Evaluation Readiness' is proposed as one solution to the issue of limited evaluability in the literature. Evaluation Readiness anticipates the need for evaluative information during all stages by preparing managers for the scale and questions with which their programs will be evaluated and providing a built in surveillance system to facilitate this process (Ibid).

### **Evaluation in Urban Planning**

In their study of the advances and prospects of evaluation in the field of urban planning, Oliveira and Pinho (2010) make use of the term 'generations of evaluation' ranging from the measurement of individual policies and programs to going beyond the strict scientific dimension to include human, political, social, cultural and contextual factors. The authors point out that for the latter, planning theory has attempted to make a contribution to the evolution of evaluation by placing an exclusive focus on the evaluation of planning activity (Ibid). Planning activity is described as pertaining exclusively to the city and the production of plans which are focused on controlling and guiding urban development (Ibid). In the realm of planning evaluation, Oliviero and Pinho (2010) as well as numerous other authors (Baer, 1997, Feitelson, 2011, Seasons, 2003) also reference an ongoing gap between evaluation theory in



planning and evaluation in professional planning practice which continues to be the subject of much discussion in the literature. Seasons (2003) explains that the origins of this debate date back to the planning literature of the 1960s which advocated techno-rational, structured and quantitative evaluation techniques over other forms of evaluation including qualitative approaches (Seasons, 2003). The literature describes how the debate over evaluation began when rational approaches became heavily criticised by practicing planners as their implementation was often hindered due to high costs, lack of expert capacity to effectively analyze results and a lack of resources needed to manage growing large volumes of data.

The reasons why organizations decide to evaluate their urban plans are many; Feitelson (2011) tells us that the planning process can be improved as a result of the knowledge acquired through evaluation (Feitelson, 2011, Olverio and Pinho, 2009, Seasons, 2003, Talen, 1996). While Talen (1996) explains that if planning is to achieve success in addressing urban ills, planners need to know the extent to which their plans have been successfully implemented (Talen, 1996). Baer (1997) explains that as an increasing number of states are instituting mandated planning objectives and evaluation is useful for planners responding to such mandates. Seasons (2003) further builds on Baer's point by telling us that in these recent tight financial times many municipal governments have adopted a corporate model of organization which relies on evaluation to guide decision making which affects the work done by planners (Seasons, 2003).

For Talen (1996) evaluation in planning is necessary to support the notion that planning matters and the profession can empirically support its claim to legitimacy by distinguishing good plans from bad (Talen, 1996). Seasons (2003) provides a further rationale explaining that evaluation legitimizes planning before citizens, providing reliable appraisals and results throughout the whole planning process while also tracking the course of planning proposals, promoting a framework in which suggestions for changes



can be supported (Seasons, 2003). Finally, Feitelson (2011) explains that evaluation can also drive planning processes as it forms a distinct stage in theoretical planning frameworks such as the rational comprehensive planning model which continues to exert a considerable force within organizations (Feitelson, 2011). These authors have not only highlighted the fact that there is a myriad of reasons why practitioners evaluate urban plans but also that evaluation can help achieve many desirable objectives in planning practice.

Like the program management field, the timing of evaluation in urban planning also plays an important role. Evaluation can occur at the beginning of the planning process by promoting the comparison of alternative options and the best solution to pursue (Ex Ante evaluation), during plan implementation which can work to shift the ongoing planning process (Ongoing evaluation), at the end of the plan implementation process which focuses on the impact of the plan (Ex Post evaluation) or any combination of the three (Oliviero and Pinho, 2010). Regardless of when evaluation occurs, numerous authors point to agency commitment to evaluation as key to its success and therefore evaluation benefits need to be communicated in a way where they can easily be understood and used by political decision makers (Seasons, 2003, Talen, 1996).

Although basic guidelines for evaluation of traditional plans (ex. municipal official plans) can be embedded in legislation, detailed evaluations in urban planning tend to be organizationally specific and almost totally voluntary. In many planning departments, evaluation is often described as one of the forgotten phases in the planning process (Seasons, 2003). When studying evaluation in 11 regional municipalities as well as the City of Toronto and two counties in Ontario, author Mark Seasons found a significant gap between the process of implementing evaluation strategies found in the literature and what was actually being undertaken in local planning departments (Ibid). Seasons (2003) attributed many of his findings to a number of organization factors working against detailed evaluation of



municipal plans including reductions in local government revenue, service downloading from senior governments and amalgamations which resulted in staff layoffs, service cuts and low morale resulting in planners doing the best they could with the limited resources available and so a significant gap existed between what were highlighted as evaluation best practices by planning scholars and what was actually feasible in evaluation circles among practitioners.

Like other forms of evaluation, one of the main challenges with evaluating urban plans is the lack of a single approach which can be applied to every situation (Oliveira and Pinho, 2009). Such a dilemma can make selecting the most effective evaluation method for a particular plan problematic especially given that results will often vary according to the approach that was chosen by the planning practitioner. Furthermore, author Emily Talen explains that in the planning field, what can be considered to be a successful outcome following the implantation of a plan is highly variable (Talen, 1996). There are many plan evaluation methods found in the literature however most can be grouped into two main categories: 1. Conformance-based evaluations and 2. Performance-based evaluations (Oliveira and Pinho, 2010). Conformance-based evaluations focus on the outcomes in reality compared to the initial plan proposals and the promotion of planning goals through the implementation of the instruments available (Ibid). Conversely, performance-based evaluations focus on process and see the plan as a decision making framework and see its usefulness depending on what happens to the plan after it has been adopted (Ibid).

William Baer provides four major performance and conformance based evaluation techniques commonly used by practicing planners. The first is 'Plan Critique' which is undertaken by external professional planning evaluators after the plan's publication but before it has been implemented (Baer, 1997). Plan Critique is based on the evaluator's professional judgement and can be largely subjective according to their perception of the plan (Ibid). 'Plan Testing and Evaluation' involves testing alternative



ways to achieve a plan's stated goal (Ibid). Unlike Plan Critique, Plan Testing is typically performed internally by the team responsible for preparing the plan usually at the initial stages of development (Ibid). Baer's third method is 'Comparative Plans Research and Professional Evaluation' where an internal or external researcher familiar with the plan is assigned to compare several plans systematically after they have been adopted (Ibid). Baer adds a fourth approach: 'Evaluating Post Hoc Plan Outcomes' to his list of methods where after plans are implemented they can be further evaluated empirically to determine how the plan performed (Ibid). Baer's suggested techniques for plan evaluation are an example of the multiple approaches available to practitioners seeking to effectively incorporate evaluation into their planning processes.

Other methods of evaluation in urban planning can range from Cost-Benefit analysis where a monetary value is assigned to each project action or output, the use of Planning Balance Sheet Analysis (PBSA) which integrates non empirical impacts by distinguishing the extent to which different groups and stakeholders will be effected by the plan (Oliveira and Pinho, 2010). Still other methods include Environmental Impact Assessment, Evaluating various subsystems of a plan (housing, employment, and land use etc- Talen, 1996) and more participatory evaluation techniques including 'Issue Generating Assessment' where planners work to focus stakeholder discussions about a particular plan (Feitelson, 2011, Oliviero and Pinho, 2009).

In an evaluation of downtown plans in Providence, Rhode Island from 1960 to 2000, author Brent Ryan found that a process of incremental implementation had occurred whereby plan ideas left over from earlier plans were incorporated into later plans and subsequently realized (Ryan, 2006). In his landmark study for the American Planning Association titled 'Making Places Special: Stories of Real Places Made Better by Planning', Gene Burmell adds to Ryan's findings by telling us that the crucial message is that many different planning activities contribute to the success of a place over time



(Hopkins, 2006). Given both Ryan and Burmell's findings, it is surprising that the notion of 'incremental implementation' is not found more in the literature surrounding evaluation in urban planning, especially considering as William Baer tells us, urban plans usually show the time needed for full implementation but they never show how much time should actually pass before the full effects of the plan should be evaluated (Baer, 1997).

This section has covered a wide range of topics including the motivating factors behind evaluation of traditional urban plans, different evaluation methods used by planners, the timing of evaluation and the contemporary debate between evaluation theorists and planning practitioners. It should also be mentioned that unlike the program administration field where external evaluators often play a pivotal role, traditional urban plans were more likely to be evaluated by internal members of the planning team. Reasons behind a preference for internal evaluation in urban planning can be found in Seasons (2003)'s description of many of the present challenges facing local government including reductions in revenue needed to hire external evaluators and evaluation's forgotten role in the planning process (Seasons, 2003).

### **Evaluation and Strategic Planning**

This section focuses on the role of evaluation in strategic planning including a focus on strategic plans which work to integrate principles of sustainable development at the municipal level. The creation of strategic plans which incorporate sustainable principles is an example of the emerging complexity to which municipalities must respond in part due to the fact that in the 21<sup>st</sup> century, global environmental crises including the loss of biodiversity and growing greenhouse gas emissions has resulted in an increased demand for a move toward more sustainable practices (Burke and Conroy, 2000). Terms like sustainable development and climate change are also increasingly becoming mainstay in planning literature as decision makers are being pushed by public pressure to reconsider old ways and seek



alternative planning strategies that promise a longer term legacy on both ecological and human grounds (Gibson, 2008).

In her book entitled 'At the Edge- Sustainable Development in the 21<sup>st</sup> Century,' author Ann Dale explains the need for an integrative approach based on ecological, social and economic imperatives in human systems (Dale, 2001). Many see the public pressure for planners to develop such an integrative approach to planning as resulting from the fact that the costs and pitfalls of previous (unsustainable) approaches are becoming more visible and citizens are increasingly aware of the interconnections between ecological, social and economic imperatives at every level (Gibson, 2006). In addition, as author Robert Gibson notes, both the public and private sectors have spent over a decade selling their commitment to sustainable development concepts and are now being pressured to act accordingly (Ibid).

Although citizens and communities are embracing sustainable concepts in response to the costs and pitfalls of previous approaches to planning, many planners still have only a partial understanding of how to translate such concepts into practice (Burke and Conroy, 2000). Furthermore, in this era of financial crisis, it can be difficult for organizations to defend spending on specific sustainability and environmental initiatives unless they are aware of the direct benefits such strategies can provide (Bear, 1997). Therefore, planners need to be able to demonstrate that plans intended to advance sustainable development are making progress toward such goals while also learning how they can better define and operationalize sustainable principles in these documents; this is where the process of evaluation comes in (Burke and Conroy, 2000).

One such model developed to evaluate the extent to which strategic plans define and operationalize the concept of sustainable development is Berke and Conroy, 2000's comparison of 30 strategic plans following their implementation (Berke and Conroy, 2000). In this study, each policy in the



plan was first classified based on the sustainable development principle promoted by the policy found in the plan (Ibid). Secondly, the planning technique for promoting the given principle was identified (Ibid). Finally, each policy was evaluated based on whether it was a suggested or required action according to the plan (Ibid). Burke and Conroy's model provides a basis for the evaluation of strategic plans via a method of comparison which subsequently applied by Jepson (2004) and Saha and Paterson (2008).

Jepson, 2004 used a comparison method of evaluation by cross-referencing two prominent sources in strategic planning literature and comparing them to the criteria found in the U.S. Department of Energy's Center of Excellence for Sustainable Development web page which specializes in informing communities on how they can adopt sustainable development strategies (Jepson, 2004). By using this method, the author was able to establish thirty-nine strategic techniques and tools that contribute to sustainable development at the local level (Ibid). These tools and techniques were used to create a mail survey sent to 390 U.S. cities that had populations of at least 50,000 people asking respondents to evaluate the extent to which these actions were being implemented in their locale and/or to identify the principle barriers to implementation (Ibid).

Saha and Paterson, 2008 attempted to improve on Berke and Conroy 2000 and Jepson 2004's approaches to evaluation by first undertaking a comprehensive review of local strategic plans and related literature to compile a list of 66 initiatives that promoted concepts of sustainable development and subsequently using the list to create a survey based on dividing the 66 initiatives into three categories: environmental protection, economic development and social equity. The authors' survey was given to 50 individuals considered to be experts in the field of community sustainability (Ibid). Respondents were asked evaluate the 66 options provided and select the five most significant initiatives that promoted sustainable development at the local level (Ibid).



In addition to evaluating strategic plans in order to identify the extent to which they incorporate principles of sustainable development, Edwards and Haines, 2007 also developed a framework to evaluate the use of smart growth principles in strategic plans in Wisconsin (Edwards and Haines, 2007). In order to conduct the evaluation, the authors first selected a sample of 30 strategic plans from a database provided by the state department responsible for issuing grants to municipalities; strategic plans were then selected based on whether the municipality had been successful in obtaining the funds and whether their plan had been legally adopted; this was subsequently followed by a telephone interview with all 30 subject municipalities (Ibid). Finally, the authors developed a plan evaluation form and protocol followed a content analysis was undertaken to evaluate each of the plans for the extent to which they included principles of smart growth (Ibid).

These studies have highlighted many of the driving factors behind the creation of strategic plans at the local level and provided a few examples of strategic plan evaluation found in the literature. The examples highlighted above demonstrate that a range of methods exist for evaluating strategic plans including the extent to which such plans contain concepts not easily quantified like sustainable development and smart growth. Additional examples of evaluating strategic plans can also be found in the study of a new kind of local government planning document, the municipal Climate Action Plan (CAP).

### **The Case of Local Government Climate Action Plans**

The final section of this literature review will focus on evaluation literature surrounding municipal Climate Action Plans (CAPs) which often come in a variety of forms and contain an array of both climate mitigation and climate adaptation strategies. The municipal CAP was chosen due to the interconnected relationship between local governments and climate change including fact that municipalities play a fundamental role in both producing greenhouse gases and responding to the



effects of a changing climate (Bassett and Shandas, 2010). Furthermore, global climate change is now widely being acknowledged to present one of the greatest planning challenges for the next 50 years and beyond.

In addressing the impacts of a changing climate, the spatial elements of urban planning (land use, transportation etc.) have received little attention in the literature surrounding climate policy (Grazi et al, 2008; Robinson, 2009). In their evaluation of some 20 municipal Climate Action Plans (CAPs), Ellen Bassett and Vivek Shandas explain there are several aspects of CAP plans which distinguish them from previous planning efforts (Bassett and Shandas, 2010). Firstly, the authors explain that the problem of greenhouse gas production is highly technical and requires different types of data and training than traditional areas of planning (Ibid). Secondly, most citizens do not have firsthand experience with climate change and maybe unsure of its causes and outcomes (Ibid). Lastly, climate change is described as extremely political and this may make it more difficult to obtain the necessary support by decision makers in undertaking CAPs (Ibid). All three aspects make evaluation in CAP processes potentially even more critical in CAP planning processes in order to demonstrate progress (or lack thereof) towards plan goals and build on planners' existing knowledge levels.

When evaluating 20 Climate Action Plans (CAPs) after implementation from municipalities with a range of sizes and locations, Bassett and Shandas (2010) used a scoring matrix coupled with interviews with 16 individuals associated with 15 of the plans (Bassett and Shandas, 2010). The researchers then compared data from both the plans and interviews based on the array of climate-relevant policies identified for adoption (breadth) and how fully developed and operationalized each of the plan's proposed policies and actions were (depth-Ibid). As Climate Action Planning processes are still considered to be quite new, it was not surprising that few other methods were found in the literature on the best ways to evaluate them.



Given that Climate Action planning processes differ from the traditional work undertaken by municipal planners because, among other things, climate change impacts can affect municipal-wide systems and new types of expertise are required to understand the evolving science of climate change, it is not surprising that Bassett and Shandas (2010) also found that municipal planning departments and related agencies did not play a central role in CAP processes. Often a multidisciplinary municipal 'Climate Action' office would be established to coordinate planning efforts or such tasks were assigned to Environmental Services and/or Engineering Departments with planners relegated to an advisory role (Ibid). Since climate action planning is not mandated or promoted through state or national legislation in North America, it was also not surprising that the authors found that departments performing CAP work were found to have acquired strong political backing (Ibid). These findings can be seen as directly applicable to large urban municipalities with climate plans, including the Cities of Toronto and New York whose climate planning processes are among the most complex in North America.

Discussions concerning evaluation of Climate Action Plans (CAPs) in the literature inevitably turn to the role of the International Council for Local Environmental Initiatives (ICLEI) and its influence on climate action planning processes, its outcomes and evaluation (Bassett and Shandas, 2010). As many municipalities involved in Climate Change planning are now ICLEI members (707 in the United States as of March, 2010), the organization's role as the dominant player in climate change planning is described in the literature (Ibid). ICLEI's role in evaluation of municipal CAPs will be discussed more in the next section of this paper.

In sum, the studies presented in this section have provided a review of evaluation literature from three distinct perspectives: the program management perspective, the urban perspective and the strategic planning perspective in order to outline the current state of knowledge in these areas. A distinct focus on evaluation in the development of municipal Climate Action Plans was included as this is



seen as the forefront for evaluation in strategic planning in the 21<sup>st</sup> century. Several important points have been highlighted including how evaluation methodologies can be contrasted from one another by the person(s) assigned to evaluate including the propensity for planners to conduct their own internal evaluations, the lack of a single evaluation approach which can be applied to every situation, the knowledge that there are many reasons why organizations decide to evaluate their plans and programs and in many instances there exists an ongoing gap between evaluation in academic theory and evaluation in professional practice. Furthermore, the literature indicates that there is also a host of tools available for those seeking to evaluate including methods to assess relatively new kinds of strategic plans like municipal Climate Action Plans. The next section will apply these findings in a document analysis of material on evaluation in climate action planning with a specific focus on municipal adaptation planning; a rapidly growing area of importance as local governments look to respond to the effects of a warming climate.

## **Policy Review**

A growing body of knowledge now exists critiquing the ineffectiveness of past mitigation only responses to climate change. Author Stephen Wheeler in his article “State and Municipal Climate Change Plans: The First Generation” noted when evaluating a number of Climate Action Plans in U.S. cities that although a few did adopt mitigation policies in the late 1980s and 1990s, these cities only looked at the issue as a topic of study or tried to limit a few selected emissions (Wheeler, 2008). Wheeler (2008) found that only 5 out of the 35 municipal departments he surveyed had climate change plans which mentioned adaptation and of those 5 many made plans only made indirect reference to adaptation principles speaking instead to strategies like the reduction of heat island effects through the use of urban forestry (Wheeler, 2008).



One explanation for the relatively recent incorporation of adaptation principles into Climate Action Plans can be found in Boyd et al (2009)'s "Exploring Development Futures in a Changing Climate: Frontier for Development Policy and Practice." In this article the authors tell us that adaptation was not considered as serious an issue as mitigation under the UN Framework Convention on Climate Change until the UN Nairobi Agreement in 2006 (Boyd et al, 2009). Boyd et al (2009) explains that climate change scientists now say the world is looking at a minimum global increase of four degrees Celsius in average temperature regardless of potential mitigation strategies and local governments must start immediately to integrate adaptation principles into physical planning as municipalities require time to learn as they go (Ibid).

With a growing acknowledge of the importance of adaptation strategies in local climate adaptation planning, this section will review professional reports as well as related articles and texts drawn from four principle agencies considered to be at the forefront of municipal adaptation planning in Canada: the International Council for Local Environmental Initiatives (ICLEI), the Clean Air Partnership, Natural Resources Canada (NRCAN) and the Canadian Institute of Planners (CIP). Insights will be drawn from the various strands of recent learning surrounding evaluation as highlighted in the literature including experiences from the relevant fields of program management and traditional and strategic plan making and apply them to the emerging field of municipal adaptation planning.

### **What is a Municipal Climate Change Adaptation Plan?**

Municipalities typically have many different types of plans including a municipal Official Plan, which among other things provides a policy framework to address local needs and guide development in the community (CIP, 2011). A municipal climate change adaptation plan is different from an official plan in that it is specifically focused on the local impacts of climate change (Ibid). The Canadian Institute of



Planners defines a local climate change adaptation plan as a document which “addresses the climate change impacts, risks and consequences faced by a community as well as opportunities and prospects. The plan prioritizes the consequences and prospects and suggests adaptation actions” (CIP, 2011 P.3). It is also important to note that a municipal adaptation plan does not necessarily include strategies that address the root causes of climate change though mitigation of greenhouse gases.

### **Natural Resources Canada and the Canadian Institute of Planners**

The Government of Canada’s Department of Natural Resources (NRCAN) has published a comprehensive handbook entitled “Adapting to Climate Change: An Introduction for Canadian Municipalities,” which is meant to guide local governments through the decision making processes surrounding climate change adaptation planning (NRCAN, 2010). Chapter 4 of the NRCAN guide focuses on moving forward once a local adaptation plan has been developed but surprisingly, this section fails to mention evaluation as an important step in the process (Ibid).

Instead of a specific evaluation stage in the planning process, Natural Resources Canada (NRCAN) recommends focusing on incorporating adaptation principles and actions into other existing and future municipal plans, policies, regulations and budgets which may or may not contain their own evaluation criteria (NRCAN, 2010). Examples provided by NRCAN include incorporating adaptation principles and actions into emergency response plans, land use plans, and capital infrastructure plans and funding programs (Ibid).

Although it can be assumed that other municipal plans may include tools for evaluation, there was a surprising lack of information on the role of evaluation in local adaptation planning found in the NRCAN handbook. One method of evaluation not mentioned in the report can be taken from the



literature in the form of Bassett and Shandas (2010)'s approach whereby elements of climate change plans were measured after they had been incorporated into existing municipal plans and policies using a scoring matrix. The matrix was based on the array of climate-relevant policies and actions identified in each plan and the extent to which they had been implemented (Bassett and Shandas, 2010).

Further survey of the work done by Natural Resources Canada (NRCAN) indicates that many of its publications on local government adaptation planning have been developed in partnership with the Canadian Institute of Planners (CIP), the national body representing the planning profession in Canada. NRCAN and CIP have collaborated on a series of best practice case studies and manuals for the development of local adaptation plans across the country including a Local Climate Change Adaptation Toolkit for the Territory of Nunavut. The Nunavut toolkit identifies evaluation (review) as a distinct step in the adaptation planning process (CUP, 2011):

Figure 1. The Step 5 Evaluation Stage forms a Key Part of the Adaptation Planning Process in the Nunavut Toolkit

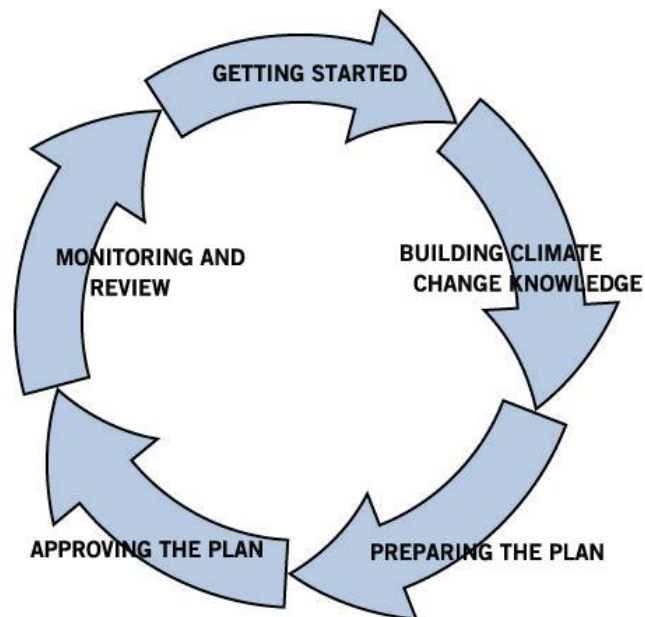


Image Courtesy: Canadian Institute of Planners, 2011

The Nunavut Toolkit not only includes evaluation as a distinct step in the adaptation planning process but also provides a basic framework for how the evaluation should be completed and how it



should inform plan making (CIP, 2011). The guide explains that as actions associated with climate change adaptation can take considerable time to implement, indicators and milestones need to be developed in the planning stage and an annual report should be published on the progress (or lack thereof) the community has taken toward goals highlighted in the plan (Ibid). Progress reports are what Nachmais, (1980) referred to as 'Process Evaluation' and the use of indicators and milestones developed in the initial planning process is reminiscent of Cohen and Cohodes (1985)'s concept of 'Evaluation Readiness' whereby the need for evaluative information is taken into account during all stages of plan preparation (Cohen and Cohodes, 1985). The Nunavut toolkit also advises that the annual review should be undertaken by the principle planner in consultation with other team members involved in the plans original development (CIP, 2011). Such a method is in line with William Baer's 'Plan Critique' whereby the evaluation is largely based on the evaluator's professional judgement (Baer, 1997). The evaluation methodology found in the Nunavut toolkit can be considered one example of an effective practice that can be undertaken with limited time, money and staff resources available in light of the limited resources for evaluation identified by Seasons, 2003.

In addition to an annual review, the Nunavut Toolkit also calls for a major evaluation of the adaptation plan every 5 years to ensure its continued relevance as the science surrounding climate change is not static and new information may require minor or major revisions to the plan (CIP, 2011). The recommended method for the 5 year review is to start with a community meeting to examine annual progress reports and get input from scientists, politicians and community members as to whether any minor modifications are needed or if significant revision is required (Ibid). Again it is recommended that a senior planner should lead the review in consultation with other government agencies, stakeholders and the community (Ibid). The decision that a senior planner should lead the review process also reflects one of the ways in which the evaluation methodologies found in the



Nunavut toolkit differ from other approaches and remain distinct in accordance with the time, money, staff resources, legislative requirements, and type of evaluation being conducted.

One of the key differences between the annual reporting and the major review is that the number of parties involved in the process increases significantly after five years with a strong participatory element. Methods used for the five year review fall in line with the use of 'Issue Generating Assessment' whereby the planner works to focus stakeholder discussions on a particular plan, in this case the local adaptation plan (Feitelson, 2011, Oliviero and Pinho, 2009). Community involvement in the evaluation process is also seen as the same participatory component supported by Nichols (2002) in his review of evaluation theory in the policy and program administrations fields (Nichols, 2002).

Key support for plan evaluation in the Nunavut Toolkit is said to come from a 'local champion' in the form of either a politician, seniors administration or other well connected member of the community whose job it is to promote the adaptation planning process including the evaluation stage (CIP,2011). This call for the importance of the 'local champion' is echoed in the findings of Bassett and Shandas (2010) when they explain that as climate action planning is not mandated, departments performing such work were found to have acquired back of at least one prominent political decision maker .

Natural Resources Canada (NRCAN) and the Canadian Institute of Planners (CIP) have also collaborated on a climate change adaptation report for the City of Iqaluit which uses an innovative information sharing tool called a 'Mind Map' to visually display the impacts of climate change in the city and the various departments and stakeholders that function as key actors along with their respective plans and documents (CIP, 2011). The Mind Map is an innovative tool in adaptation planning according to NRCAN and CIP which could be applied to the evaluation stage as it works to visually recognize the



cross-cutting nature of climate change (Ibid). The map also helps to integrate adaptation principles and actions existing municipal plans, policies and decision-making process of many groups in the City as recommended in the NRCAN handbook. The mind map can be seen as an example of a more integrative tool for climate change planning and evaluation as it works to highlight ecological, social and economic imperatives surrounding the local effects of climate change (Dale, 2001).

Figure 2. Example of a Climate Change Mind Map

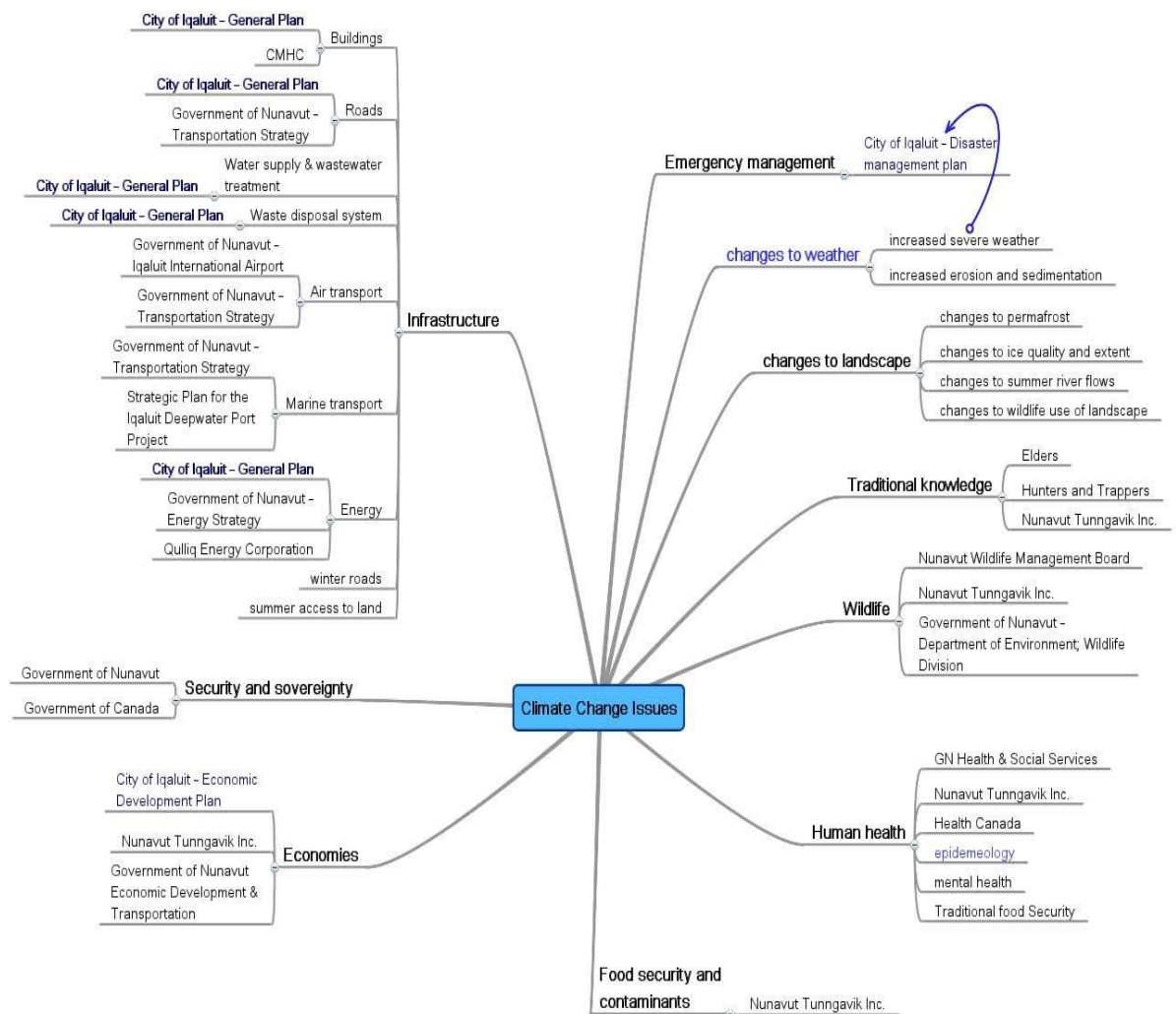


Image Courtesy: Canadian Institute of Planners, 2011

Another NRCAN/CIP publication is a best practice manual for municipal climate change adaptation planning in small Canadian communities. Similar to the Nunavut Toolkit, the small



community handbook also recommends a major review of the adaptation plan take place every 5 years following its implementation especially once adaptation recommendation outlined in the CAP have been incorporated into other municipal plans, policies and budgets (CIP,2011). Unlike the Nunavut Toolkit however, the small communities handbook focuses on participatory evaluation lead by planners whose primary task is to gather feedback on the plan through advertised public meetings and submit information gathered to council for consideration (Ibid). In this case, the planner's role as information gatherer during plan evaluation can be seen as one strategy to inform politicians of the influence and benefits local climate change adaptation processes can provide, therefore putting those decision makers in a better position to defend spending on such initiatives (Baer, 1997).

In a 2008 report written for Natural Resources Canada (NRCAN) and the Canada Institute of Planners (CIP) entitled "Enhancing Canada's Adaptive Capacity through Better Use of Climate Knowledge in Land Use Planning," author Jose Otero speaks to a number of evaluation tools and emerging practices in local climate change adaptation planning (Otero, 2008). The report speaks to the need for planners to obtain quantitative information regarding the performance and cost effectiveness of various adaptation options, both in the planning process and once the plan has been implemented. Two examples of component specific quantitative evaluation tools for adaptation plans mentioned in the report are the Tree Inventory and Map prepared for the City of Washington D.C. and the on-line 'Green' Infrastructure Calculator prepared by the Chicago-based Center for Neighbourhood Technology (Ibid). While the Tree Inventory and Map is a tool used to calculate and display the ecological progress and costs associated with tree cover, the 'Green' Infrastructure Calculator measures the effectiveness of infrastructures like swales, planting, permeable paving and reduction in storm water runoff flows (Ibid). Both tools can be applied to the literature as examples of author Emily Talen's suggested method of evaluating the various subsystems of a plan in order to compile an overall picture of the plan's effectiveness (Talen, 1996).



An emerging trend in climate change evaluation for local adaptation plans highlighted by Otero is the use of 'Participatory Integrated Assessments' (PIAs- Otero, 2008). PIAs are said to combine policy development and climate research in one process to built community awareness, support for research and enhance credibility and legitimacy of evaluation results (Ibid). Such exercises are typically undertaken by planners and scientists collaborating with stakeholders through two main types of research models: The first is the use of analytical methods taken from the natural sciences including model analysis, scenario analysis and risk analysis (Ibid). Secondly, participatory methods taken from the social sciences are used including expert panels, policy exercises and focus groups (Ibid). Together PIAs allow direct communication between scientists and planners to maximize the relevance of evaluation results (Ibid). PIA processes also work to address one of the unique challenges to climate change response planning; the fact that the problem of greenhouse gas production is highly technical and requires different types of data and training than traditional areas of planning (Bassett and Shandas, 2010). On the timing side however, some of the pitfalls of PIAs are that they may take months or years to execute as they involve organizing research teams and large numbers of community leaders and experts (Otero, 2008).

Finally, using its collaboration with Natural Resources Canada, the Canadian Institute of Planners (CIP) has published its "Model Standard of Practice for Climate Change Planning" which includes a series of best practice recommendations for evaluating municipal adaptation plans (CIP, 2011). For CIP the uncertain elements of climate change including the impact of mitigation measures and a lack of complete understanding surrounding earth's biosphere means at best planners can make educated estimates of climate change impacts but cannot make such predictions with perfect accuracy (Ibid). This amount of uncertainty and need to manage the risks associated with a changing climate means that



ongoing (process) evaluation as identified by Nachimas (1980) is especially important for local adaptation planning and should be built into every plan (Ibid).

CIP explains that “evaluation will help determine the on-the-ground results of planning approaches and identify the need for additional efforts or resources. As (climate change) forecasts become more precise and the effectiveness of initiatives is determined, climate change plans will need to be re-examined” (CIP, 2011 P.3). The Institute divides evaluation into three key components. The first component is to evaluate level of activity and determine if the activity has kept pace with the original schedule found in the plan (Ibid) often through the use of periodic reporting using conformance based evaluation techniques as recommended by Oliveira and Pinho (2010). The second component is performance measurement that is linking cause and effect to evaluate results based on a series of relevant indicators (CIP, 2011). The final component is re-evaluation which allows for a basic review of the assumptions on which the plan was developed given that climate science is always changing (Ibid).

Due to the immediate nature of climate change and the likelihood that many planning responses will take time to implement, CIP advises that planners should develop strategies and subsequently evaluation methods to achieve results in the short term while also establishing a long term path toward more ‘climate-friendly’ communities (CIP, 2011). One of the key challenges identified by CIP is that traditional tools for evaluation like Oliveira and Pinho (2009)’s Cost-Benefit Analysis need to go beyond monetary values to measure not easily quantifiable costs and benefits associated with climate change adaptation planning such as habitat and species protection, social equity, and heritage preservation (CIP, 2011). The need to re-evaluate the applicability of tools like Cost-Benefit Analysis is also an example of reconsidering old ways to work toward seeking alternative strategies that promise a longer term legacy on both ecological and human grounds highlighted by Gibson (2008).



One important evaluation principle for CIP is that even if an action or outcome cannot be easily measured doesn't mean it is not worth pursuing; rather evaluation should allow a "narrative of impact to be told, backed up by quantitative data wherever possible" (CIP, 2011 P.4). For example, in the case of increased transit ridership, one must consider improved levels of service, increase in fuel prices and high density development around transit stations, all of which may have contributed to the outcome but the precise impact of each strategy may remain unknown and so it becomes necessary to tell the complete story backed by available data. Such an approach can be seen to reflect Oliverio and Pinho (2010)'s performance-based evaluation framework which sees the value of the plan as a decision making framework and the mixed method evaluation strategy using both quantitative and qualitative techniques recommended by Smith (1990) and Cooksy et al (2001).

### **Evaluation, Climate Adaptation and the Clean Air Partnership**

The Clean Air Partnership is a Toronto based environmental non-governmental organization (ENGO) that is focused on addressing critical issues of air quality and climate change in the Great Lakes Region (Clean Air Partnership, 2012). The organization also publishes a number of climate change adaptation strategies and case studies for local government and partnered to develop an Evaluation Toolkit as a guide for other ENGOs. Clean Air's Evaluation Toolkit speaks to the importance of mandatory evaluation in the NGO sector to share results and lessons learned with funders as a response to the growing demand for accountability and funding as highlighted in the work of Milliar et al (2001) (Ibid). Evaluation also allows Clean Air to gain new skills, take lessons from other sectors and use the findings for future applications for funding and improve strategies to meet mission objectives (Ibid).



The key question for the Clean Air Partnership, along with other ENGOs and their funders when evaluating is: How can they improve their ability to make a difference for their stakeholders? (Clean Air Partnership, 2009) Examples of how evaluation works toward fulfilling the partnership's mission goals includes informing program design and educating staff, assessing whether a program is achieving its intended purpose, measuring cost effectiveness of programs and communicating results with stakeholders and funders (Ibid). In order to improve program and plan delivery, Clean Air believes that evaluation should be conducted by their own internal staff, save for where the use of external evaluators can demonstrate a clear benefit (i.e. expertise and credibility), be participatory wherever possible and utilization-focused to provide decision-makers with the information they need, when they need it (Ibid).

Methods favoured by the Clean Air Partnership for conducting evaluations include the using of logic modelling similar to the work of Brouselle and Champagne (2011), Milliar et al (2001), Cooksy et al (2001), and Julian (1997) utilized to translate organizational actions to achieve a plan or program's goal in reality and theory driven evaluation which attempts to examine data from different evaluation methods under a single theoretical framework (Smith, 1990, Cooksy et al, 2001). Timing of the evaluation is said to be dependent on a number of factors include the stage of program development, complexity of the program, grantee experience with evaluation and role of the evaluator (Clean Air Partnership, 2009). It is important to note that although the Clean Air Partnership publishes both an Evaluation Toolkit and strategies and case studies for local government adaptation to the effects of climate change, the information highlighted above could not be found in any Clean Air climate change adaptation plans or case studies.



## **The International Council for Local Environmental Initiatives**

The International Council for Local Environmental Initiatives (ICLEI) is an international association of more than 1200 local, regional and national governments that have made a commitment to sustainable development including adapting their communities to the effects of a warming climate (ICLEI, 2012). ICLEI is a renowned leader in municipal climate change adaptation planning and has coauthored two major publications to guide agencies through the process of preparing local adaptation plans: “Preparing for Climate Change: A Guidebook for Local, Regional and State Governments” and “Changing Climate, Changing Communities: Guide and Workbook for Municipal Climate Adaptation” (Ibid). ICLEI’s approach to local climate adaptation planning in both of these publications comes in the form of a ‘Five Milestones Adaptation’ methodology reflecting the technique of process evaluation described by Nachimas (1980) and Oliverio and Pinho (2010) whereby each milestone builds off the previous step providing an ongoing opportunity for planners to review and evaluate their previous findings and decisions (ICLEI, 2009).

Milestone 5 of ICLEI’s five step planning process is review and evaluate which includes reviewing the plan’s basic assumptions, including vulnerability and risk assessments, vision and guiding principles, preparedness goals, and the information collected from specifically assigned indicators built into the plan (ICLEI, 2009). To aid in evaluating throughout the 5 milestone process, climate modeling software is recommended in a manner similar to NRCAN and CIP as one method to help determine if the adaptation plan is still relevant (Ibid).

As process evaluation or ongoing evaluation is already built into its 5 milestones planning methodology, ICLEI does not specify a time for a major summative or impact evaluation after the



adaptation plan has been implemented. A lack of specified timeframe is largely due to the fact that the organization views planning for the impacts of climate change as an ongoing process (ICLEI, 2009). ICLEI believes that the time for performance measurement will depend on the nature and risks that the plan is addressing in priority areas and the planning horizon and/or budgetary cycle that each individual local government has for its capital projects and ongoing operations (Ibid).

One unique method of performance measurement identified by ICLEI is a measure of resilience (ICLEI, 2009). ICLEI defines a measure of resilience as “a quantitative or qualitative judgment that the planner develops and tracks over time to determine how well a preparedness action meets the goals set out in the adaptation plan” (ICLEI 2010, P. 18). During evaluation measures of resilience can be used be reframed in the form of a question to determine whether adaptation measures are meeting the intended vision of the adaptation plan (Ibid).

ICLEI also recommends measuring a large number of other evaluation measures including community awareness about climate change impacts, mainstreaming of climate change information into other municipal plans and policies, adaptive capacity of built, natural, and human systems, and community partnership and stakeholder engagement in decreasing vulnerability and risk to climate change in the community (ICLEI, 2010). Examples of other recommended evaluation methods include community surveys, counting the number of plans or governing documents in which climate change adaptation is addressed, existence of guidelines on how to integrate new information on climate change into existing municipal undertakings, measuring the amount of money saved by implementing adaptive actions, and the existence of a local task force or advisory panel on climate change issues (Ibid).



A number of rationales are identified by ICLEI for incorporating evaluation into the local adaptation planning process. By conducting honest and open evaluations and sharing those results, ICLEI believes that governments can respond to the public demand for transparency and accountability as described by Millar et al, 2001 (ICLEI, 2010). Furthermore, as municipalities are able to demonstrate progress toward climate goals through evaluation, they will be able to bolster public support for such initiatives, potentially increase funding for climate adaptation initiatives within the corporate organizational model identified by Seasons (2003) and strengthen community partnerships by sharing their evaluation results with external agencies (Ibid).

Similar to the agencies mentioned above, ICLEI also highlights the importance of evaluation in adaptation because of the uncertainties that exist around climate change and the anticipation that important assumptions which are used to guide the planning process will change over time (ICLEI, 2010). The organization emphasizes the need for a tool to tell if a plan is working or not and the extent to which it may need to be modified (Ibid). Like NCAN, CIP and the Clean Air Partnership, other evaluation rationales identified in ICLEI reports include new data on the science of climate change becoming available and the needs to change priority areas for adaptation response as the impacts of a changing climate are felt (Ibid). Finally, rather than specifying who should conduct the evaluation, ICLEI believes that multiple parties including politicians, planners and budget experts should be evaluating at multiple levels and for multiple audiences from the adaptation planning team to the community at large (Ibid).

The documents reviewed in this section have provided a review of published material on evaluation in climate action planning with an explicit focus on municipal adaptation plans. Drawing from the various strands of recent learning surrounding evaluation highlighted in the literature, synthesis has focused on a number of professional reports as well as related articles and texts drawn from four



principle agencies considered to be at the forefront of municipal adaptation planning in Canada. The next section will explore how local governments have successfully incorporated post implementation evaluation criteria into their municipal climate change adaptation plans while also identifying the timelines, methods and the resources used to measure the success of these documents.

## **Analysis**

Through the analysis research will explore how the Cities of Toronto and New York have incorporated the evaluation criteria highlighted in the literature and policy review into their Municipal Climate Change Adaptation Plans while also reviewing the timelines, methods and the resources needed to measure the success of these documents. The first part of this section will begin with an analysis of evaluation criteria in Toronto's Climate Change adaptation strategy found in the City's 'Clean Air and Sustainable Energy Action Plan' and entitled 'Ahead of the Storm: Preparing Toronto for Climate Change.' The second part will analyze relevant sections of the 'New York City Panel on Climate Change 2010 Report' and New York's 'PlaNYC' initiative which presents a strategic planning framework for the City until the year 2030 and whose climate-focused initiatives are considered to be a best practice example of municipal adaptation planning.

### **The City of Toronto's Response to Climate Change**

In July, 2007 Toronto City Council unanimously adopted the City's current 'Climate Change, Clean Air and Sustainable Energy Action Plan.' Upon adoption, the City's climate action plan contained a specific action which required the development of a climate change adaptation strategy for Toronto (City of Toronto, 2012). In April, 2008 Toronto's Environment Office in collaboration with the Clean Air Partnership releasing the City's adaptation strategy entitled 'Ahead of the Storm: Preparing Toronto for



Climate Change.’ Together the overall climate action plan and its adaptation strategy constitute the bulk of the municipal response to climate change in Toronto (Ibid).

As part of Toronto’s Climate Change Adaptation strategy, ongoing evaluation was included as the ninth step in the plan in order to measure the effectiveness of adaptation initiatives and adjust the strategy accordingly in response to continuing climate changes (City of Toronto, 2012). By incorporating evaluation as its own step within the City’s adaptation strategy, Toronto has followed the recommendations found in the literature outlining the need is to build evaluation measures from the initial planning phases onward as well as the best practice guidelines found in the Nunavut Toolkit and ICLEI 5 Milestones planning framework whereby evaluation is included as a distinct step in the planning process and works to inform future updates of the adaptation plan.

The major driver for evaluation in Toronto’s adaptation strategy is that the scientific information which forms the basis of the City’s adaptation planning is continually changing; therefore as new information becomes available and projections change, updates to the City’s strategy will be required (City of Toronto, 2008). In step nine of Toronto’s plan there are a number of specific evaluation measures which together amount to a major evaluation of the plan as outlined in multiple Canadian Institute of Planners and Natural Resources Canada publications including the Nunavut Toolkit and the best practice manual for adaptation planning in small Canadian communities. According to the plan, the City’s progress toward adapting to the effects of climate change is to be evaluated by measuring six key criteria:

1. The level of internal and external awareness about climate change, its impacts and levels of support for adaptive actions.



2. The level of collaboration between the City, the public, the scientific community, non-governmental organizations and other agencies and businesses in working toward finding solutions for the local challenges presented by climate change.
  3. The level of technical capacity available to determine the local risks of climate change.
  4. The extent to which climate change considerations have been incorporated into city policies, plans and programs in priority areas identified in the plan.
  5. The extent to which climate change adaptation strategies reduce stress on vulnerable systems.
  6. How the implemented adaptation strategies worked in extreme weather events
- (City of Toronto, 2008).

These six criteria are examples of both Oliveiro and Pinho's concept of 'Ongoing Evaluation' and Nachmais' 'Process Evaluation' framework whereby as the plan continues to be implemented, evaluation can occur which works to shift the ongoing planning process (Oliverio and Pinho, 2010, Nachmais, 1980). Toronto's use of ongoing and process evaluation in its adaptation strategy is also supported by the Canadian Institute of Planners in its 'Best Practice Manual' who cite the need to build such a strategy into every climate change adaptation plan and is also included in ICLEI's 5 milestones adaptation planning methodology. The City summarizes the importance of ongoing evaluation by explaining that "Climate change adaptation cannot be a one-time effort. It is a *process* that will need to be in place for the foreseeable future. Many of *the actions* that we can take to prepare Toronto for climate change, however, can make the City a safer, more sustainable place to be ahead of the storm" (City of Toronto, 2008 P. 7).

Another key part of Toronto's process evaluation strategy is a strong participatory component highlighted in both the plan's first and second measures which includes the City, the public and stakeholders playing a key role in evaluation of the plan (Nichols, 2002). The City has included evaluation



measures of technical capacity and collaboration with the scientific community which may provide an opportunity for Toronto to utilize Otero's Participatory Integrated Assessment Approach (PIA) whereby policy development and climate research are combined in one process to build community awareness to improve and enhance the legitimacy of evaluation results (Otero, 2008). PIAs and other participatory approaches are supported by the Canadian Institute of Planners, Natural Resources Canada, the Clean Air Partnership and the International Council for Local Environmental Initiatives (ICLEI) in their best practice adaptation planning publications. ICLEI specifically states that community awareness about climate change impacts and local partnerships as well as stakeholder engagement in the community should play a role in evaluation of the adaptation plan (ICLEI, 2010).

By measuring levels of collaboration and the extent to which climate change considerations have been incorporated into city policies, plans and programs, Toronto's adaption strategy contains strong performance-based evaluation strategies whereby success is measured based on the plan's usefulness as a decision making framework depending on what happens to the plan after it has been adopted (Nachmais, 1980). One of the chief recommendations found in Toronto's climate change adaptation plan is that "All City agencies, boards, commissions, corporations and divisions identify in their budget submissions specifications and programs they plan to undertake regarding climate change adaptation" (City of Toronto 2008, P.8). Such integrative actions reflect Natural Resources Canada guidelines which recommend incorporating adaptation strategies into existing city policies, plans and programs which may contain their own evaluation criteria; however this strategy could be improved on by including an additional evaluation method in the plan such as Berke and Conroy's method of identifying and classifying each relevant technique integrated into different city policies, plans and programs and subsequently evaluating them based on whether they were a suggested or required action (Berke and Conroy, 2000).



The timing of evaluation in Toronto's climate change adaptation strategy consists of a detailed schedule for developing, implementing and evaluating the strategy:

Figure 3. City of Toronto 2008 Schedule for Adaptation Strategy Development

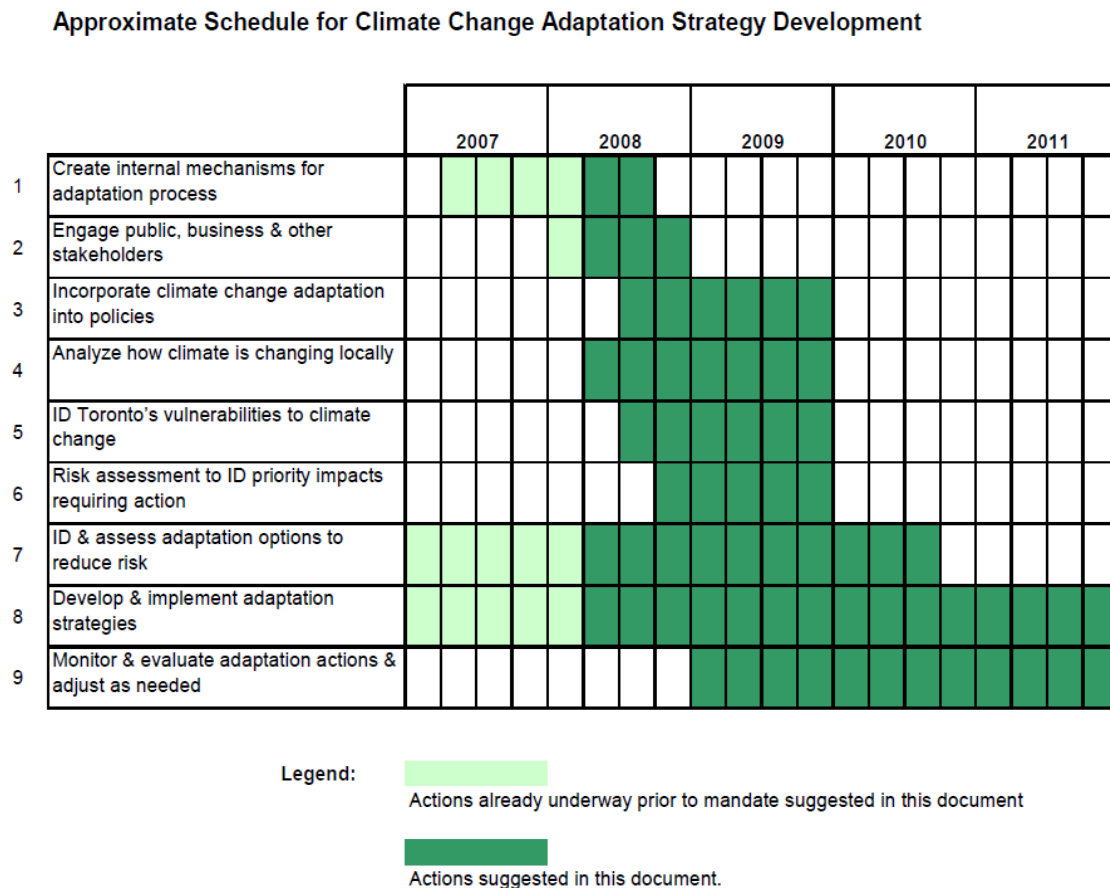


Image Courtesy: The City of Toronto, 2008

Unfortunately, the City's adaptation strategy does not elaborate on whether an annual review of the plan should be undertaken in addition to a major evaluation as recommended by Natural Resources Canada and the Canadian Institute of Planners. However, the document does state that in addition to short term actions, the adaptation strategy needs to have a longer term component which works to address the challenges presented by a changing climate for long term infrastructure and urban planning (City of Toronto, 2008). The plan also recommends a periodic review of progress on climate change



adaptation should be undertaken and communicated to decision makers and the public to help ensure continual progress (City of Toronto, 2008). Such references would appear to imply the need for both short and longer term evaluations; however the lack of detailed timeframe may be in part due to the fact that the plan views planning for the impacts of climate change as an ongoing process (ICLEI, 2009).

Interestingly in its Climate Change Plan, Toronto highlights the fact that “over \$1 billion has been allocated for the next five years (as of 2008) in the City’s capital budget for projects that will help reduce greenhouse gas emissions (mitigation)” however there is no mention of the specific financial, human or other resources needed for adaptation or to evaluate the City’s adaptation strategy following its implementation (City of Toronto, 2008 P.6). Furthermore, Toronto’s adaptation strategy does not specify who should be charged with conducting the evaluation (ex. internal or external evaluators) or the preferred method for measuring the six evaluation criteria highlighted above. Such information is critical to adaptation planning, because as author Emily Talen explains, in the planning field, what can be considered to be a successful outcome following the implantation of a plan is highly variable (Talen, 1996).

As an option for improving its climate change adaptation plan, the City of Toronto may wish to investigate the feasibility of applying the evaluation framework found in the Canadian Institute of Planner’s Standard of Practice in Climate Change Adaptation Planning whereby a ‘narrative of impact’ is told for actions that may not be easily measured backed up by quantitative data wherever possible (CIP, 2011 P.4). Where they can be applied, quantitative methods for measuring the six criteria in the adaptation strategy could also be taken from ICLEI’s 5 Milestones Planning Methodology which highlights a number of quantitative approaches to adaptive plan evaluation including the use of community surveys, counting the number of plans or governing documents in which climate change adaptation is addressed and/or measuring the amount of money saved by implementing adaptive



actions (ICLEI, 2009). Should Toronto wish include such information in its adaptation plan, it would also reinforce the need for planners to obtain quantitative information regarding the performance and cost effectiveness of various adaptation options once plans have been implemented (Otero, 2008).

### **New York City's Comprehensive Adaptive Planning and Evaluation**

In 2008, the same year Toronto published 'Ahead of the Storm,' New York City Mayor Michael Bloomberg convened the New York City Panel on Climate Change (NPCC) "with the mandate to provide New York with the most up to date scientific, technical and socioeconomic information about climate change and its impacts on the City" (NPCC, 2010 P.3). The NPCC is composed of climate change scientists, university scholars and private sector experts totalling some 40 members, who with the help of funding from the Rockefeller Foundation continue to assist the City in implementing its climate change plans and evaluating the effectiveness of such initiatives (NPCC, 2010).

As part of the NPCC's mandate, its members were charged with developing recommendations for how New York could best adapt to a changing climate and structure its NYC 2030 comprehensive plan accordingly including appropriate evaluation measures (Ibid). Mayor Bloomberg's high level proactive leadership in initiating the NPCC and coordinating the ongoing adaptation planning process is described as one of the reasons why New York continues to be at the forefront of local adaptation planning and continues to be active in evaluating its climate related plans and programs (City of New York, 2011).

Mayor Bloomberg's leadership represents one of the major differences between the City of Toronto's climate change adaptation strategy and that of New York City; the continued presence of a dominant 'local champion' for climate change adaption planning and evaluation. As highlighted by the



Canadian Institute of Planners and Natural Resources Canada and related evaluation literature, the ongoing support of a 'local champion' in the form of either a politician, senior administrator or other well connected member of the community is key to support adaptation plan evaluation given that such work is rarely mandatory under current legislation (Bassett and Shandas, 2010).

Mayor Bloomberg's influence as a 'local champion' in New York's climate change adaptation processes can also be seen in the fact that staff assigned to implement and evaluate climate focused initiatives are not found in the City Planning Department but rather in the Mayor's office as part of its Department of Long-Term Planning and Sustainability (City of New York, 2011). Such a separation between climate planning and traditional city planning reflects Bassett and Shandas (2010)'s findings that traditional municipal planning departments do not play a central role in climate planning processes, including evaluation of such plans with the majority of traditional urban planners being instead relegated to an advisory role .

At the bureaucratic level in New York, evaluation of the City's adaptation plans is led by the Director of the Mayor's Office of Long-term Planning and Sustainability and supported by the Director of Sustainability at the Department of City Planning and the Commissioner of Preparedness and Planning at the City's Office of Emergency Management (City of New York, 2011). The New York Panel on Climate Change (NPCC) also continues to play an integral role in providing new information and strategies to city departments needed to evaluate and update existing adaptation plans. The NPCC provides the City with the latest climate projections, updated flood maps incorporating sea level rise projections and tools to increase the resilience of homes and business through the use of an online portal which can be accessed by the City, the NPCC and the public at large (Ibid).



The establishment and ongoing contributions of the New York City Panel on Climate Change (NPCC) is an example of the application of Jose Otero's use of 'Participatory Integrated Assessments' (PIAs) in climate change adaptation planning whereby policy development is combined with climate research in one process to build community awareness, support for research and enhance credibility and legitimacy of evaluation results (Otero, 2008). Cynthia Rosenzweig and William Solecki from the NASA Centre for Climate Systems Research reinforce the importance of the City-NPCC PIA linkage by telling us that "the collaborations brought forward embody the culmination of a first step in a science-policy linkage that will be required to effectively address climate change in New York City" (NPCC, 2010 P.20). Taking direction from the Mayor, the NPCC expert panel is an example of one participatory method adopted from the social sciences which has allowed direct communication between city staff, political decision makers and expert scholars with knowledge of analytical methods taken from the natural sciences including scenario and risk analysis which forms an integral part of New York's climate change adaptation plan including its evaluation framework (Ibid).

In New York's PlaNYC 2030 strategic sustainability plan, the 11<sup>th</sup> section focuses on climate action and the final chapter is devoted to implementation of the overall plan including evaluation of climate adaptation initiatives. This puts evaluation of climate change adaptation within the context of an overall sustainability planning framework and as part of a broader number of actions to make New York a more sustainable city by the year 2030. Such integration of climate evaluation can be seen as an innovative best practice as it not only reflects the need for an integrative approach based on ecological, social and economic imperatives in human systems (Dale, 2001) but also reconsiders traditional ways of climate planning whereby municipal Climate Action Plans, Sustainability Plans and Official Plans are created as separate documents. New York's integrative approach to climate adaptation planning and evaluation also reflects Robert Gibson's call for alternative strategy which promises a longer term legacy on both ecological and human grounds (Gibson, 2008).

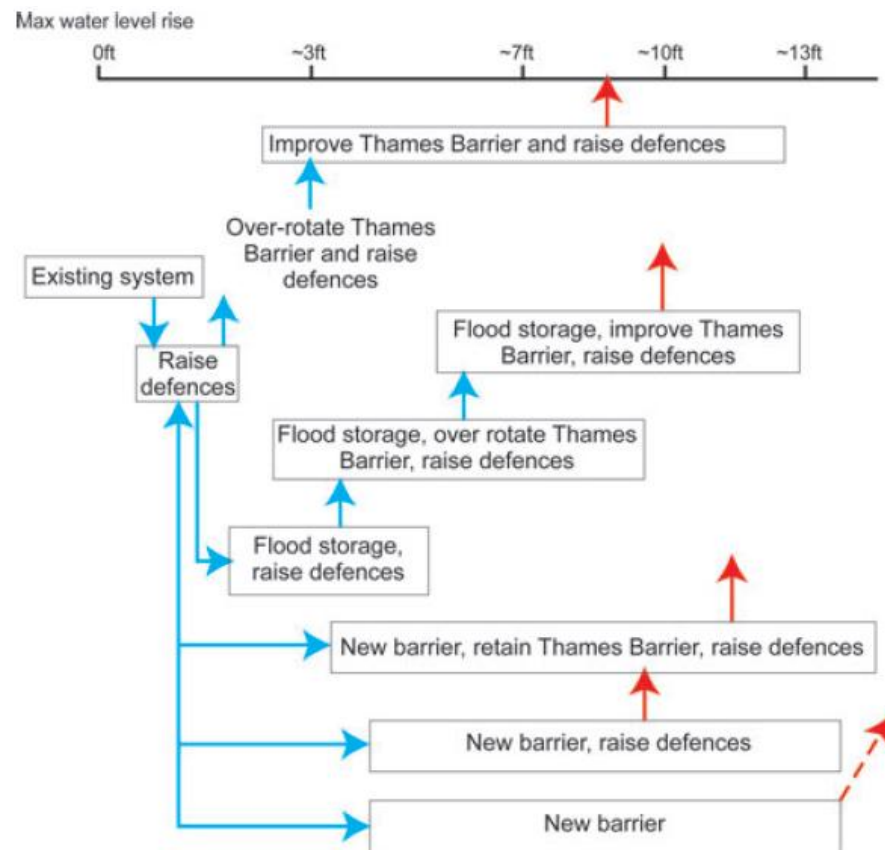


Climate relevant sections of PlaNYC are based on a risk management planning approach whereby adaptation is part “of an iterative process that recognizes explicitly the need for mid course corrections as our (New York’s) understanding of the underlying science and its translation into climate variability as well as climate impacts evolves” (NPCC, 2010 P.37). In other words, climate adaptation sections of PlaNYC were explicitly designed to be the subject of ongoing evaluation as highlighted in the literature and policy analysis by both the scientific and planning community with results contributing to updates of the plan as recommended by ICLEI, Natural Resources Canada and the Canadian Institute of Planners in their best practice guidelines. Ongoing evaluation in PlaNYC 2030 is undertaken by using a climate risk assessment tool developed in partnership with the NPCC that attempts to measure indicators built into the plan and quantifies present and future climate risks to prioritize investments, develop cost-benefits and tracks the City’s progress (City of New York, 2011). The need for ongoing evaluation is further reflected in the implementation section of PlaNYC 2030, where initiative #4 is to ‘regularly assess climate change projections’ by institutionalizing the NPCC and establishing a process (the online portal) for climate scientists to provide regular updates to the City on climate change data (City of New York, 2012).

The driving force behind ongoing evaluation of climate adaptation sections found in PlaNYC 2030 is “the perception of risk” to the City as a result of a changing climate (NPCC, 2010 P.36). As a result of the risks faced by New York, the NPCC helped develop a risk management approach which led to the implementation of ‘Flexible Adaptation Pathways’ that can evolve over time as climate risks, evaluation of implemented adaptation strategies and monitoring by the City continue (Ibid). New York’s use ongoing flexible adaptation pathways was adopted from the City of London’s response to climate change whereby such an approach was first used to protect London from coastal storms and adjusted based on the known level of risk to the City:



Figure 4. City of London Adaptive Pathways Model for Coastal Storms



Source: New York Panel of Climate Change, 2010

Flexible Adaptation Pathways mean that as new information on climate change becomes available from evaluation by either the scientific community or by measuring indicators found in PlaNYC 2030, New York will respond by adjusting its adaption plan on a predetermined course corresponding to the new level of risk facing the City.

The key for success of PlaNYC's use of flexible adaptation pathways will be to link evaluation of new scientific data by the NPCC and the results of plan indicators measured under the direction of the Mayor's Office of Long Term Planning and Sustainability to the City's capital and operating budgets (NPCC, 2010). To establish such an ongoing link means the Mayor's Office must continue to coordinate with other departments, the NPCC and city leadership, including Mayor Bloomberg whose continued



role as a 'local champion' is critical (Ibid). The importance of ongoing coordination and integrating the results of evaluation with New York's budgeting process can also be seen in the fact that although specific resources needed for evaluation are not mentioned, every climate initiatives found in PlaNYC 2030, including evaluation has been assigned a corresponding funding source (either the City's capital budget, operating budget or external funding including grants) from which to draw resources.

The cities of Toronto and New York contain some of North America's most complex urban regions. By analyzing local adaption planning documents in both cities a snapshot has been presented for how communities can use planning principles under an expanded mandate to evaluate the success of their climate change adaptation strategies. From an evaluation standpoint, there are numerous reasons to be optimistic about the extent to which both New York and Toronto have applied best practices found in the literature and policy analysis in their municipal climate change adaptation plans. Although driven by different motivators, both cities have embedded ongoing evaluation as a distinct step in their adaptation planning process, provided direction for evaluation to inform future updates of their plans and integrated climate evaluation within a broader planning framework. New York City's PlaNYC 2030 in particular can be seen as the benchmark for evaluating climate adaptation plans as evaluation is conducted through ongoing collaboration between the City and scientific community via the use of an ongoing Participatory Integrated Assessment. PlaNYC 2030 also works to integrate formerly separate planning processes together, uses innovative flexible adaptation pathways to apply evaluation results and has garnered the continued support of a 'local champion' to drive the evaluation process.



## **Lessons for Local Governments and the Planning Profession**

Although climate adaptation plans come in many forms, the literature, policies and best practice examples highlighted above provide a number of lessons for planners seeking to effectively incorporate evaluation criteria into their municipal adaptation plans. As growing numbers of municipalities look to develop and implement local climate change adaptation plans it is also intended that these lessons can be used under an expanded mandate to embed evaluation and the application of its results successfully into the adaptation planning processes.

The first lesson for planners is that as the creation of climate adaptation plans are currently undertaken on a voluntary basis, they remain distinct from other types of plans like municipal official plans which in most jurisdictions are required to be evaluated at set intervals under a legislative framework. Such a voluntary basis also means there are a number of different drivers which lead local governments to initiate evaluation of their climate plans including accountability to the public and political decision makers, emerging information on the science of climate change and the amount of risk being faced by the municipality. Depending on the driver for evaluating a municipal adaptation plan, there will be differing resources and expertise available which will in turn affect the evaluation process, outcome and the extent to which evaluation results inspire action and go to inform future updates of the plan.

The second lesson is that there are a range of tools available for planners seeking to effectively incorporate evaluation into their climate change adaptation planning processes including methods for measuring the outcomes of a plan which are not easily quantified. Examples of such tools can be drawn from the literature, policies and plans highlighted above including Bassett and Shandas (2010)'s approach to evaluating municipal CAPs via comparison referred to by Baer (1997) as 'Comparative Plans Research and Professional Evaluation,' Talen (1996) and Otero, (2008)'s approach to evaluating



individual plan subsystems, ICLEI's measures of resilience and community surveys, Natural Resources Canada and the Canadian Institute of Planner's use of 're-evaluation' and 'mind mapping,' and the Canadian Institute of Planner's method of allowing a "narrative of impact to be told, backed up by quantitative data wherever possible" (CIP, 2011 P.4).

New tools for evaluation are also continually emerging such as the use of Participatory Integrated Assessments (PIAs) described by Otero (2008) as a recent trend in climate change evaluation for local adaptation plans (Otero, 2008). Such a practice was recently applied with success in New York City whereby policy development was combined with climate research in one process to build community awareness, support for research and enhance credibility and legitimacy of evaluation results (Ibid).

The third lesson is that evaluation of adaptation plans cannot occur at only a single point in time as climate change and its effects are not static, new information is continually emerging and many adaptive actions take a long time to implement (NPCC, 2010). Evaluation of adaptation plans must be part of an ongoing planning process that is responsive to the latest scientific and climate planning information. Evaluating on an ongoing basis also requires that adaptation plans be designed from the outset to anticipate the need for new information during all stages of the planning process and clear channels established to incorporate the results of evaluation into other existing municipal plans, programs, permitting processes and budgets as recommended by Natural Resources Canada and the Canadian Institute of Planners (Cohen and Cohodes, 1985, NRCAN 2011, CIP, 2011). ICLEI's 5 Milestone approach to adaption planning can be seen as a best practice in this regard as it embeds evaluation throughout the entire planning process (ICLEI, 2009).

From the beginning, adaptation planners may wish to ask themselves if the plans they are creating will in fact produce valuable results once they have been evaluated. Such a practice may follow



Smith (1990) and Cohen and Cohodes (1985)'s practice of 'evaluability assessment' whereby in a policy (or plan's) initial stages it is pre-assessed to determine whether evaluation is likely to be useful in improving performance (Smith 1990, Cohen and Cohodes, 1985). The use of ongoing evaluation may also be strengthened if it is recognized as a distinct part of the planning process which is in turn used to inform updates of the plan as recommended in the policy analysis and currently being applied in the Cities of Toronto and New York.

The fourth lesson for planners is that persons assigned to conduct the evaluation remains a significant factor in adaptation planning processes. As local adaptation planning processes are increasingly being undertaken by a separate multidisciplinary 'Climate Action' office, it is likely that these offices will also coordinate internal evaluation of adaptation plans (Bassett and Shandas, 2010). As is the case in New York City, the success of such processes may depend in large part on the support provided by municipal planning departments acting in an advisory role.

External Non-governmental organizations such as the International Council for Local Environmental Initiatives (ICLEI), the Clean Air Partnership and professional bodies like the Canadian Institute of Planners (CIP) have also taken on leadership roles in guiding evaluation of climate adaptation planning processes. For example, the City of Toronto's 'Ahead of the Storm' Climate Change Adaptation Plan including its evaluation criteria was undertaken in tandem with the Clean Air Partnership and ICLEI has led numerous evaluation and adaptation planning processes across North America. The scientific community also continues to evaluate, revise and update its climate projections on an ongoing basis making new information available. The success of evaluation in many municipalities will depend on the strength of the strategic partnerships between local government adaptation planners, the scientific community and non-governmental agencies. It will also require external agencies that partner with



municipalities to evaluate their own approaches to climate adaptation planning on an ongoing basis, such as in the case of the Clean Air Partnership where such approaches must be integrated with practices found in the agency's evaluation toolkit.

The fifth lesson is that agency commitment to evaluation is key to its success in adaptation planning processes. Agency support is needed to make sure evaluation of adaptation plans does not become forgotten in the planning process especially given that planning for the effects of climate change does not have an end date (Seasons, 2003). This lesson gives weight to the findings of Talen, (1996) and Seasons (2003) when they suggest that evaluation benefits need to be communicated in a way where they can easily be understood and used by political decision makers in order to garner agency support (Seasons, 2003, Talen, 1996). The significance of agency commitment to evaluation can be seen in New York City where Mayor Bloomberg's leadership in initiating the New York Panel on Climate Change and coordinating the ongoing evaluation of the City's adaptation plan is one of the reasons why New York continues to be at the forefront of local adaptation planning (City of New York, 2011).

The final lesson is that much of the value of a municipal adaptation plan lies in its use as a decision making framework to inspire action for municipalities to respond to the effects of a changing climate; this makes performance-based approaches to evaluation ideal as part of an ongoing evaluation process as the adaptation plan's success may indeed lie in its use as a decision making framework instead of as a rigorous regulatory document. Performance-based evaluations focus on process and see the plan as a decision making framework while determining its usefulness depending on what happens to the plan after it has been adopted (Oliveira and Pinho, 2010). Performance-based strategies also add an element of flexibility to the evaluation of post hoc plan outcomes as any action the plan inspires can



be taken into consideration with the changing needs of cities including those that have tangible benefits today and will have even greater benefits as the climate changes (NPCC, 2010).

## **Conclusion**

An increased realization that the local effects of climate change are becoming more apparent and to some extent cannot be avoided has confronted municipalities amidst increasing costs of senior government downloading, a lack of new revenue sources and a growing demand for accountability. In the last decade a number of city governments have responded to the risks posed by climate change by voluntarily creating local climate adaptation plans which come in a variety of forms and remain distinct from other types of municipal plans due to their need for different types of data, expertise, partnerships and public awareness.

In addressing the impacts of a changing climate, municipal planners can play a critical role in developing strategies to ensure that communities are able to be proactive and respond effectively to climate change. As it is often left up to local governments to allocate their own resources to evaluate the success of Climate Adaptation plans and cities play an interconnected role in responding to the effects of climate change, evaluating the success of these documents continues to be a growing area of importance for all community decision makers seeking to know if the steps they are taking in their adaptation plans are working effectively to prepare for the impacts of a warming climate.

After examining relevant evaluation literature including the program management fields and traditional urban plan making, a review of professional reports was undertaken with sources drawn from four principle agencies considered to be at the forefront of municipal adaptation planning in Canada. Findings from the literature and policy review were subsequently applied in an analysis to explore how the Cities of Toronto and New York have successfully incorporated evaluation criteria into



their Municipal Climate Change Adaptation Plans including the identification of parties involved along with the driving forces, timelines, methods and the resources needed to measure the success of these documents. Based on the observations highlighted above, six lessons have been presented for planning as a profession to guide the implementation of successful evaluation criteria in adaptation planning processes including an overview of available tools, the importance of ongoing evaluation, agency support, strategic partnerships and the adaptation plan's significance after implementation as a decision making framework.

There is no one size fits all answer to the risks of climate change and reducing such risks will not be achieved through one single plan or action (City of New York, 2011). The extent of successful evaluation in adaptive planning processes will depend on a number of variables including the changing science associated with climate change (NPCC. 2010). It is hoped that the research highlighted above will contribute to improving adaptive planning and will aid local governments and planning professionals in understanding the role evaluation can play in adaptation planning processes as climate change remains one of the largest challenges facing cities both now and in the decades to come.



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