

# Strategic environmental assessment and regional infrastructure planning: the case of York Region, Ontario, Canada

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Strategic environmental assessment (SEA) is seen as an instrument that is essential to realizing sustainability goals that transcend project-level undertakings (e.g. policies, plans and programmes). The purpose of this case-based, collaborative research was to extend practical and theoretical understanding of SEA to the related, but in practice poorly coordinated, processes of project-level environmental assessment (EA), master planning and regional land use planning. Semi-structured key informant interviews and review of policy documents were used as the main sources of qualitative data to explore the key events that have led to an emerging strategic approach to planning and EA in York Region. This research contributes to the application of SEA at the municipal level, and highlights the importance of an SEA-type approach as a contribution to better informed, tiered and integrated planning and decision making that is underpinned by sustainability.

Keywords: strategic environmental assessment, sustainability, tiering, communication, master plan, official plan, York Region

**S**TRATEGIC ENVIRONMENTAL ASSESSMENT (SEA) could play an important role in facilitating better informed, more credible and more broadly beneficial strategic initiatives, but despite recent advances in knowledge and experience, in practice, the story has been quite different. Even

though principles for best practice SEA call for a sustainability-led assessment process (e.g. IAIA, 2002), most applications have been narrow in conceptual and spatial scope, and have not paid enough attention to how a comprehensive sustainability-based process should look.

In addition, many SEA conceptualizations focus on a discrete, formal assessment of plans, policies or programmes that culminate in a report which is used to help make decisions, following a project environmental assessment (EA)-style protocol (e.g. Bass, 2005; Fischer, 2007; EC, 2008). Our research addresses SEA as an approach to decision making rather than an informational piece (used or not) to make the final decision. As such, SEA is addressed as a dynamic, ongoing process (as opposed to a static, one-time study) that is informed by a broader conceptual foundation of sustainability principles. It is through this perspective that our research analyses an SEA-type approach that has emerged in York Region, Ontario, Canada. We use the term 'SEA-type' to describe

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approaches that do not meet formal specifications or definitions of SEA, but that have some of their characteristics or elements.

York Region's interest in a more strategic approach to environmental decision making was the result of a 'policy window' (Kingdon, 1995) that opened in the wake of a flawed municipal wastewater EA process. The crisis caused by this generated great public opposition, and served as the focusing event that led to the adoption of an SEA-informed process for infrastructure planning and decision making in York Region (Kirchhoff *et al.*, 2010).

The main purpose of this case-based, collaborative research was to extend practical and theoretical understanding of SEA to the related, but in practice poorly coordinated, processes of project-level EA, master planning and regional land use planning. The results of this research contribute to the theoretical and practical extension of both SEA and land use planning in the context of regional growth management. This paper illustrates what was learned from the York Region experience to advance SEA practice for regional infrastructure planning in a Canadian context.

The paper begins with an overview of the literature on SEA as an evolving concept and highlights three important SEA components that are of interest to the research presented on this paper: tiering, communication and sustainability-based decision making. The case study context is then presented, followed by the research methods used. Discussion of the main research findings is organized chronologically with a focus on the following: the development of sustainability principles to guide master planning and project-level EA in York Region; organizational changes to coordinate water, wastewater and transportation master planning; and the current York Region environmental decision making context. The implications and recommendations for the theory and practice of SEA at the regional level are then presented.

## Strategic environmental assessment overview

### *The need for SEA*

If SEA is meant to be an extension of EA practice and principles at the planning, policy and programme level, it is important to define what we mean by EA and provide a brief overview of the principles and stages of a generic EA process. EA has been defined as 'the process of identifying, predicting, evaluating and mitigating the biophysical, social, and other relevant effects of development proposals prior to major decisions being taken and commitments made' (IAIA and IEA, 1999). The EA process should be applied (IAIA and IEA, 1999: 3):

- i. as early as possible in the planning and decision making stages;
- ii. to all proposals that may generate significant adverse effects or about which public concern is significant;
- iii. to all biophysical and human factors potentially affected by development, including health, gender and culture, and cumulative effects;
- iv. in a manner consistent with existing policies, plans and programs and the principles of sustainable development;
- v. in a manner that allows involvement of affected and interested parties in the decision making process; and,
- vi. in accordance with local, regional, national or international standards and regulatory requirements.

SEA has, at least in part, evolved out of a collective disillusionment with the efficacy of project EA to result in sound environmental decision making (Partidário, 2000; Fischer and Seaton, 2002; Dalal-Clayton and Sadler, 2005). In many cases, project-based EA has evolved into a proponent-driven, bureaucratic process that has compounded the inherent limitations of the project-based approach to assessing environmental impacts. The literature points to several interrelated limitations of project EA that SEA approaches are intended to address, or complement. These limitations are summarized below (adapted from Partidário, 2000; Alshuwaikhat, 2005; Gibson, 2007):

- **Project EA is rushed and reactionary:** It is pushed by pragmatic and technocratic project approval demands and often examines already selected and even already designed undertakings.
- **Project EA is narrow in scope:** Small, incremental decisions happen in the absence of a systematic, sustainability-based assessment approach, resulting in the foreclosure of alternatives and a failure to address broader spatial, temporal scales and cumulative impacts of individual projects.
- **Project EA is poorly integrated and lacks appropriate information:** Project EA has evolved into a technocratic, protocol-based process that is poorly integrated with broader planning, political and economic processes and that has come to require artificially elevated levels of certainty based on data, information and field studies that are inadequate.

The limitations of project-level EA point to broader issues that require the consideration of environmental and sustainability concerns at more strategic levels of decision making. SEA facilitates overcoming some of the weaknesses of project EA by anticipating impacts that can occur at the project level, increasing efficiency in decision making and reducing the burden of work for project EA (Fischer, 1999).

By strengthening the EA process, SEA has the potential to save time and reduce the costs involved (Dusik *et al.*, 2003).

*The evolving concept and practice of SEA:  
from project EA towards sustainability assessment*

Despite the apparent simplicity of the concept of SEA, the continuous evolution of the concept and practice has resulted in a variety of definitions of SEA in the literature. SEA was first defined as a tool that extended its process and procedure upstream from the project to the strategic level, and focused on the environmental impacts of policies, plans and programmes (PPPs) that were already proposed (Dalal-Clayton and Sadler, 2005). Dalal-Clayton and Sadler (2005: 10) contend that more recent definitions 'take a broader, more complex and varied perspective, and see SEA as including the social (and sometimes the economic) dimension.'

Based on Sadler (1996, 1999), Chaker *et al.* (2006: 17) documented that SEA has evolved into a tool 'to safeguard critical resource and ecological functions and offset residual damage,' as well as 'environmental accounting and auditing of natural capital loss and change' (Table 1). Partidário and Clark's definition (2000: 4) reflects the emergence of this new perspective on SEA:

SEA is a systematic on-going process for evaluating, at the earliest appropriate stage of publicly accountable decision making, the environmental quality, and consequences of alternative visions and development intentions incorporated in policy, planning, program initiatives, ensuring full integration of relevant biophysical, economic, social and political considerations.

Reflecting Sadler's 'next generation' of EA and, similarly, what Haq (2004) calls the third trend in

**Table 1. Evolution of EA/SEA**

Paradigm/level/stage	Key characteristics
1st generation — project EA	Broadened progressively to include social, health and other impacts, cumulative effects and biodiversity
2nd generation — SEA	Applies to the PPP and legislation
3rd generation — assurance of environmental sustainability	Uses EA and SEA to safeguard critical resources and ecological functions and offset residual damage; includes environmental accounting and auditing of natural capital loss and change
Next generation — appraisal/assessment of sustainability	Includes integrated assessment of the economic, environmental and social impacts of proposals

Source: Adapted from Sadler (1996, 1999)

EA moving towards sustainability assessment, Stinchcombe and Gibson (2001: 344–345) define SEA as 'a particular tool for analyses that contribute a sustainability component to existing decision making processes and, more ambitiously, as an approach to decision making at the strategic level that focuses on sustainability considerations.' Gibson *et al.* (2005) and Gibson (2006b) have built on the concept of SEA and developed a practical approach for undertaking a sustainability assessment. This perspective of SEA represents an effort to develop 'more effectively comprehensive, farsighted, critical and integrated approaches to decision making on important policies, plans, programs and projects' in order to 'meet the challenge of providing decent livelihoods for all without wrecking the planet' (Gibson, 2006b: 171).

*SEA issues and implementation: tiered environmental decision making, SEA as a communication tool and sustainability-oriented decision making*

Given the complexity, uncertainty and breadth of issues and scales involved at the policy, plan and programme level, strategic-level assessment versus project-level arguably requires a different approach. Mintzberg (1994) argues that, in strategic approaches related to planning, the question is not about knowing what will happen in the future, but about knowing how to plan and guide actions that can help shape and build a desirable future. This is of primary importance for SEA.

This section highlights three aspects of SEA and the important roles they play in strategic decision making:

- SEA as a tiered approach in environmental decision making (e.g. Wood, 1988; Wood and Djeddour, 1992; Partidário, 2000; Fischer, 2002; Caratti *et al.*, 2004; Dalal-Clayton and Sadler, 2005; Jones *et al.*, 2005).
- SEA as a communication tool to enable EA practitioners, planners and decision makers to understand each other's perspectives (Partidário, 2000; Richardson, 2005; Vicente and Partidário, 2006).
- SEA as a driver of fundamental change in decision making structures, as EA evolves from project EA to SEA and moves towards some notion of sustainability assessment (Gibson *et al.*, 2005; Chaker *et al.*, 2006).

These three aspects of SEA will be used as a guide for discussion in the findings and analysis section of this paper. Below, we discuss these three elements in more detail.

*Tiered environmental decision making* One of the main benefits of implementing an SEA framework is to set a strategic context for project EA, thus making project EA more efficient (Stinchcombe and Gibson, 2001). Dalal-Clayton and Sadler (2005: 19) provide

Level of government	Land use plans (SEA)	Category of action and type of assessment (in brackets) Sectoral and multi-sectoral actions			
		Policies (SEA)	Plans (SEA)	Programmes (SEA)	Projects (EA)
National/ Federal	National land use plan ↓	National transport policy →	Long-term national roads plan →	5-year road building programme →	Construction of motorway section
		National economic policy ↘			
Regional/ State	Regional land use plan ↓		Regional strategic plan ↘		
Sub-regional	Sub-regional land use plan ↓			Sub-regional investment programme ↘	
Local	Local land use plan				Local infrastructure project

**Figure 1. Tiered decision making**

Source: Adapted from Jones *et al* (2005: 7)

a useful example of how policy, plan and programme SEAs set the context for project EA. As depicted in Figure 1, ‘there exists a tiered, forward planning process, which starts with the formulation of a policy at the upper level, followed by a plan at the second stage and by a programme at the end’ (Jones *et al*, 2005: 6).

According to Dalal-Clayton and Sadler (2005: 18):

[Tiering] is frequently idealized as a hierarchical or tiered process of decision making. But in reality it is quite different...often, it is a more complex, iterative process in which the range of choice is gradually narrowed and most options are foreclosed by the project phase.

Therefore, when a policy, plan or programme precedes and influences a project decision, the policy, plan or programme and the project decision are then, in effect, ‘tiered.’ In practice, this works not only in a strict top-down manner (i.e. from policy to plan to programme to project), but also as a ‘bottom-up’ effect, in which lower-tier SEAs and project EAs can lead to an improved awareness of the limitations of prevailing policies, plans and programmes (see, for example, Hildén *et al*, 2004). With this in mind, the arrows in Figure 1 could then be updated to include arrows going both ways.

Arts *et al* (2005) assert that tiering is assumed to minimize various limitations of EA and has the following benefits:

- Prevention of the foreclosure of assessing important environmental issues.
- Better focusing of EAs (e.g. through scoping of issues, time and geographical area), type of alternatives and impacts assessed, and abstract level

of analysis (e.g. broad-brush methods, expert opinions vs. advanced quantitative and detailed methods).

- Gains in efficiency of SEA or EA (e.g. indication of major issues that need, or do not need, further elaboration; guidelines for subsequent EAs) when it is done at higher rather than at lower levels.
- Better fit with the ongoing nature of decision making and planning processes by tiering of EAs.
- Improvement of plans and projects developed and implemented.

Put differently, in traditional project EA, ‘by the time an analyst is looking at “alternative routes or locations” many past decisions have already foreclosed options. This approach is entirely too late to discuss alternative means of providing transport or energy, frustrates the public, and has too little influence’ (Partidário and Clark, 2000: 21). SEA allows for options or alternatives that are often beyond the scope of project EA. SEA can result in the consideration of a broader, more systemic suite of alternatives considered at strategic levels, providing a more comprehensive approach to addressing environmental concerns and making project-level EA more efficient. For example, a project-level question regarding whether a highway will have impacts on wildlife movement might be avoided by the strategy-level question of whether the need for the highway can be addressed through the construction of a light rail connection or another form of public transit. Thus, in terms of SEA practice, tiering ideally would indicate ‘the extent to which SEA is organized hierarchically, with one level of assessment informing the next level down (through to project EA)’ (Jones *et al*, 2005: 280).

While most of the SEA literature mentions tiering, inattention to the key role that tiering must play in

SEA practice remains a problem (Gibson, personal communication 12 November 2007). The literature highlights the potential advantages of SEA making project-level EAs more efficient. SEA has the potential to not only set individual projects in the context of broader policy decisions but can also be used to 'set the terms of reference for a resulting EA and assist in its scoping' (Jones *et al.*, 2005: 32). An SEA of a land use plan or infrastructure master plan could also outline the process or protocol for all subsequent project EAs, effectively changing the way a jurisdiction makes project-level decisions.

*SEA as a communication tool* In some contexts SEA may be more usefully considered to be a communication tool rather than a technical protocol (Partidário, 2000; Richardson, 2005; Vicente and Partidário, 2006). Given the diversity of perspectives involved in environmental decision making, any tool that can provide for more effective communication among stakeholders and decision makers would be a useful contribution. Vicente and Partidário (2006) describe the valuable role SEA can play in providing a means for impact assessors and decision makers to share perceptions of a given policy problem and to develop a shared solution.

Therefore, in the context of SEA implementation, an SEA process would be an effective communication forum if it creates 'an arena for mediation between strategic partners, where knowledge is shaped by negotiations and tensions between positions, and by the need to secure a working consensus' (Richardson, 2005: 355). We agree with Vicente and Partidário (2006: 699) in saying that 'different values related to the perception of a problem can help to reveal the common ground between impact assessors and decision makers and consequently contribute to the shared acceptance of a given solution.' In addition, SEA can play an important role in bridging different perspectives on an issue with the development of solutions.

As a communication tool, SEA can also play an important role in terms of improving communication with the public, by integrating multiple perspectives surrounding a specific issue. In doing this, SEA needs to go beyond the simple accounting of facts, which means addressing the social-political dimension of the problem (Vicente and Partidário, 2006). This mediating role of SEA could enhance the following:

- Integration of the multiple visions of the problem, and establishment of the consequent communication links towards learning interaction.
- Guidance on the communication strategies to enhance the social relevance of technical and scientific knowledge, creating new attitudes in face of technical facts.
- An adjustment among decision makers — at the level of their values and environmental attitude — of their perception of reality and therefore their

willingness to accept necessary actions for environmental reasons.

- Dialogue between impact assessors and decision makers that stimulates constructive collaboration and the production of common meanings (Vicente and Partidário, 2006: 704).

Tiering and SEA as a communication tool point to the continuous evolution of SEA towards a fundamental change in environmental decision making that focuses directly on efforts to achieve some form of sustainability. As Chaker *et al.* (2006) indicate, the next generation in the evolution of EA is sustainability appraisal, or sustainability assessment.

*Sustainability-oriented decision making* As a term, sustainability emerged in the early 1970s as a response to the two previous decades' deepening worries about damages and risks, development failures and evident growth limits (Gibson *et al.*, 2005). It emerged and evolved within the general discourse about the future of the world, in which a number of sub-themes fall under the umbrella theme of sustainability, such as limits to growth (Meadows *et al.*, 1972), steady-state economy (e.g. Daly, 1973), consumer society (e.g. Schumacher, 1973), eco-development and environment and development (e.g. Francis, 1976; Sachs, 1977), and ecology and ecologism (e.g. Bookchin, 1980; Lovelock, 1982).

However, it was not until the 1987 Brundtland Report produced by the World Commission on Environment and Development (WCED, 1987), that sustainable development became popularized and began to enter the political arena (Noble, 2002). The Brundtland Commission defined sustainable development as development that 'meets the needs of the present generation without compromising the ability of future generations to meet their own needs'. At the time, the main idea was to identify a 'pathway' through which people could create sustainable policies and practices rather than to develop a blueprint for action.

Sustainability-oriented assessment and decision making (Gibson *et al.*, 2005) represents a fundamental shift in policy making that takes sustainability as its primary set of decision making criteria. It is an 'integrative process that can act as a framework for better decision making on all undertakings — policies, plans and programmes as well as physical undertakings — that may have lasting effects' (Gibson, 2006a: 260). Pope *et al.* (2004: 595) define sustainability assessment broadly as 'a process by which the implications of an initiative on sustainability are evaluated, where the initiative can be a proposed or existing policy, plan, programme, project, piece of legislation, or a current practice or activity'. This type of assessment has been applied around the world, including Hong Kong (HKSDU, 2002), the United Kingdom (UK ODPM, 2005), Australia (Pope and Grace, 2006) and in Canada with the Voisey's Bay nickel mine on the north Labrador coast (Gibson, 2002).

Sustainability assessment builds on several key aspects of SEA, including broader conceptual, spatial and temporal scales; tiered and integrated decision making; and transparency of decision making. SEA, therefore, is a critical step in moving towards a more sustainability-oriented approach to decision making. In this regard, Gibson *et al* (2005) and Gibson (2006b) provide a set of core criteria (Table 2) and a practical approach to implementing a sustainability assessment framework.

According to Gibson *et al* (2005: 115), the ‘main advantages of the eight requirements list is that it is short, comprehensive, demanding and difficult to collapse into conventional categories’. They contain areas that are not clearly defined within just one of the traditional pillars (e.g. social, ecological and economic), which ends up fostering a better understanding and addressing of interdependencies. In addition, the ‘demand for integrated attention to all eight requirements imposes a broader agenda than most proponents and public authorities now accept’ (Gibson *et al*, 2005: 115). However, these are general requirements that must be tailored for particular circumstances paying special attention to the specifics of context, such as local ecosystems, institutional capacities, social-economic circumstances, public preferences etc.

A sustainability assessment framework would require ‘positive overall contributions to a more desirable and durable future by identifying best options (not just acceptable undertakings) and multiple reinforcing gains (not mere avoidance of problems and mitigation of adverse effects)’ (Gibson, 2006b: 178). Moreover, the sustainability concept implies that ‘assessments should encourage a turnaround from unsustainability’ and that, ‘the test of acceptability

for new undertakings should be more demanding than mere mitigation’ (Gibson *et al*, 2005: 62), since the long-term ‘mitigation-only’ strategy is doomed to fail sustainability aspirations. Moving towards sustainability requires that SEA attempts to avoid, eliminate and minimize negative impacts and also enhance/optimize positive ones. Therefore, SEA is seen as having the potential to adjust and improve the conventional planning and decision making approaches, providing a means of transition towards sustainability.

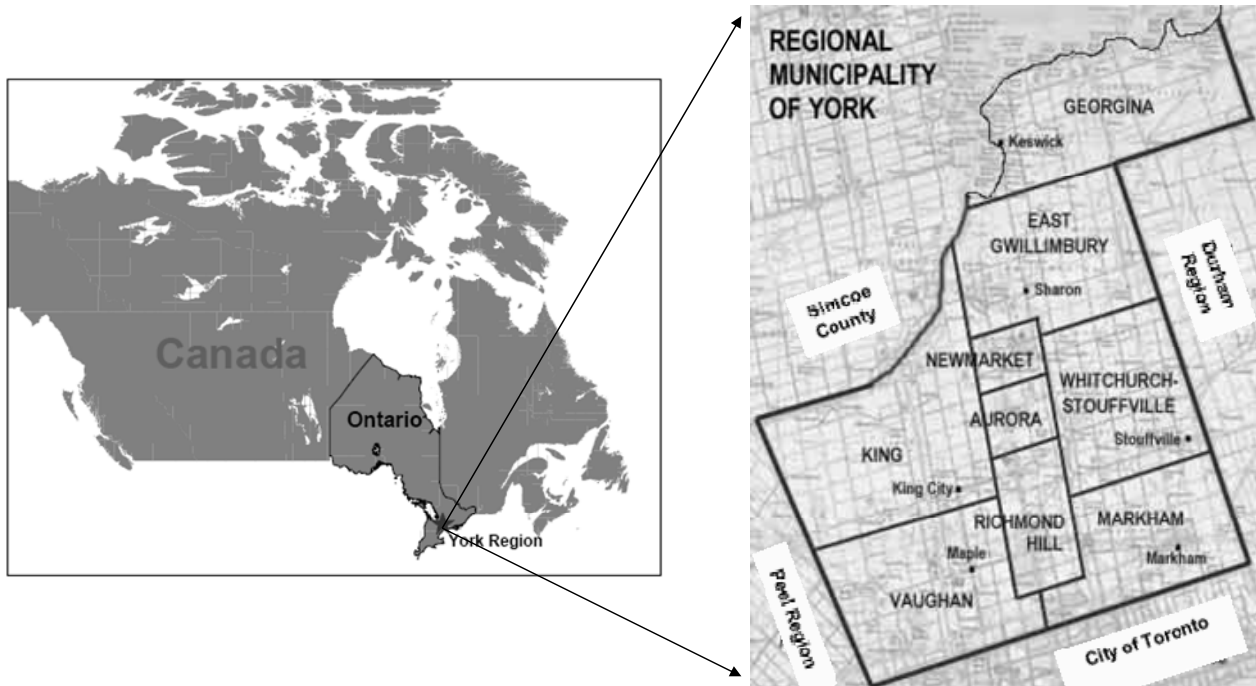
## The case study context

The Regional Municipality of York is an upper-tier municipality<sup>1</sup> in south central Ontario, Canada, covering 1,776 square kilometres from Lake Simcoe in the north to the northern boundary of the City of Toronto in the south. It borders Simcoe County and Peel Region in the west and Durham Region in the east (see Figure 2). York Region is one of six regional governments in Ontario and is among the fastest growing regional municipalities in Canada (Ministry of Public Infrastructure Renewal, 2006). The entire region is part of the Greater Toronto Area (GTA) and the Greater Golden Horseshoe, and over 69% of York Region is designated part of Ontario’s Greenbelt, which includes the Oak Ridges Moraine (York Region, 2008a).

York Region’s landscape includes farmlands, wetlands and kettle lakes, forests and the Oak Ridges Moraine, a unique protected landform that is an immense glacial moraine that runs east to west, north of, and parallel to, Lake Ontario (York Region, 2007a). One of the moraine’s most important

**Table 2. Sustainability criteria for decision making**

Principles	Requirements
Socio-ecological system integrity	Build human–ecological relations to establish and maintain the long term integrity of socio–biophysical systems and protect the irreplaceable life support functions upon which human as well as ecological well-being depends.
Livelihood sufficiency and opportunity	Ensure that everyone and every community has enough for a decent life and that everyone has opportunities to seek improvements in ways that do not compromise future generations’ possibilities for sufficiency and opportunity.
Intragenerational equity	Ensure that sufficiency and effective choices for all are pursued in ways that reduce dangerous gaps in sufficiency and opportunity (and health, security, social recognition, political influence, etc) between the rich and the poor.
Intergenerational equity	Favour present options and actions that are most likely to preserve or enhance the opportunities and capabilities of future generations to live sustainably.
Resource maintenance and efficiency	Provide a larger base for ensuring sustainable livelihoods for all while reducing threats to the long term integrity of socio-ecological systems by reducing extractive damage, avoiding waste and cutting overall material and energy use per unit of benefit.
Socio-ecological civility and democratic governance	Build the capacity, motivation and habitual inclination of individuals, communities and other collective decision making bodies to apply sustainability requirements through more open and better informed deliberations, greater attention to fostering reciprocal awareness and collective responsibility, and more integrated use of administrative, market, customary and personal decision making practices.
Precaution and adaptation	Respect uncertainty, avoid even poorly understood risks of serious or irreversible damage to the foundations for sustainability, plan to learn, design for surprise, and manage for adaptation.
Immediate and long-term integration	Apply all principles of sustainability at once, seeking mutually supportive benefits and multiple gains.



**Figure 2. Area of study**

Source: Adapted from York Region (2007a)

functions is as a water recharge/discharge area, and it has been described as southern Ontario's 'rain barrel'; its permeable sands and gravels absorb and collect precipitation, which slowly recharge the deep aquifers below the ground. In 2001, following a decades-long community-led campaign, the provincial government enacted the Oak Ridges Moraine Conservation Act, followed by the establishment of the Oak Ridges Moraine Conservation Plan (ORMCP) six months later. In 2005, the Government of Ontario established its Greenbelt Plan, resulting in the protection of over 720,000 hectares. The plan identifies where urbanization should not occur in order to provide permanent protection to the agricultural land base and the ecological features and functions occurring on this landscape (MMAH, 2008).

York Region has experienced, and continues to experience, significant development pressure. This rapid growth has made the region one of the most prosperous areas in Canada, and has resulted in the conversion of approximately 160 square kilometres of countryside to urban uses since 1971 (York Region, 2008c). The region grew from 169,000 people in 1971 to 759,000 people by 2001, and is expected to reach 1.5 million by the year 2031 (Ministry of Public Infrastructure Renewal, 2006). Approximately 350,000 employees work in the region's 21,000 businesses. Employment is forecast to double by the year 2031. Most of the growth in the region has occurred within the lower-tier municipalities of Aurora, Vaughan, Markham, Newmarket and Richmond Hill. Markham grew from a population of approximately 37,500 in 1971 to a population of 273,805 in 2006, while the City of Vaughan experienced the region's highest growth rate of 8.2% per annum over the same 35 year period (York Region, 2008f).

This growth has led to enormous pressure for new and updated infrastructure, especially in terms of transportation, water and wastewater. With one of the largest infrastructure budgets of all Canadian municipalities,<sup>2</sup> the York Region started a growth management initiative (entitled 'Planning for Tomorrow') in 2006 as part of its periodic official plan reviews (York Region, 2008b). This involved the development of a sustainability strategy and the update of infrastructure master plans, which culminated in an updated Regional Official Plan in late 2009.

There are several reasons why York Region embarked on this growth management initiative, including provincial initiatives that fundamentally changed the way growth will occur in the Greater Toronto Area over the next 25 years (i.e. Oak Ridges Moraine Conservation Act and Plan, Places to Grow Act and Plan, Greenbelt Act and Plan). The Places to Grow Act, provides a framework for the provincial government to coordinate planning and decision making for long-term growth and infrastructure renewal in Ontario. The Act gives the provincial government the power to designate geographical growth areas and to develop growth plans in collaboration with local officials and stakeholders to meet specific needs across the province (Government of Ontario, 2005).

York Region completed its first Regional Official Plan (ROP) in 1994, some 20 years after its creation. In 1997, the York Durham Sewage System (YDSS) Master Plan (later updated in 2002) was completed. The master plan identifies 'current conditions and future alternatives' necessary to provide the infrastructure to meet population projections in the region (York Region, 2008e). The 'preferred alternative' was to double the capacity by twinning the existing

YDSS. The YDSS is a complex wastewater collection system, conceived and constructed in the 1970s that extends into northern areas of York Region and converges and discharges at the Duffins Creek Water Pollution Control Plant (WPCP) on the northern shore of Lake Ontario near Pickering, Ontario, Canada.

The 1997 YDSS Master Plan identified several main projects that would need to go through an EA process, including the 16th Avenue Trunk Sewer phase I project, which was 6.7 km in length, with a pipe diameter of 2,600 mm. A number of problems emerged during the construction of this project. Tunnelling was the method of construction used, which required 'de-watering' at depths of up to 60 metres below ground to lower the water level in the immediate vicinity. In order to safely construct the shafts and tunnels of this sewer to the required depth, the groundwater level was lowered by pumping in the deep Thorncliffe aquifer to below the depth of the shaft and tunnel (York Region, 2006). Some of this water was returned to area streams and some was discharged into the YDSS (York Region, 2007c).

Due to unanticipated hydrogeological conditions, more de-watering was required than originally anticipated (York Region, 2006). This impacted private wells outside what was originally identified as the zone of influence during the pre-construction phase of the EA. These events led to a major media

campaign by local residents, environmental movement organizations and politicians criticizing the efficacy of the original project EA.

## Research approach and methods

Case study research with multiple methods was used to investigate SEA in an empirical context (Yin, 2003). To understand how an SEA-type process emerged and evolved in York Region, data collection and verification was obtained from multiple sources, including:

- Literature review;
- Semi-structured interviews; and,
- Participant observation.

Literature review helped to identify research gaps that were then explored throughout the research and guided the analysis of results. In addition, it aided in the development of interview questions and the framing of interview analysis by providing insight into areas which needed further exploration. The background and contextual information was developed for the York Region case study by reviewing academic sources, governmental documents and websites, and NGO research reports and websites.

Twenty-one key informant, semi-structured interviews were carried out with relevant stakeholders

**Table 3. Conducted interviews**

Interviewee number	Date	Affiliation
1	6 November 2007	York Region staff
2	6 November 2007	York Region staff
3	14 November 2007	York Region staff
4	14 November 2007	City of Vaughan staff
5	14 November 2007	York Region staff
6	16 November 2007	Former Ministry of Natural Resources (MNR) staff
7	22 November 2007	Environmental NGO representative
8	27 November 2007	York Region staff
9	27 November 2007	York Region staff
10	28 November 2007	York Region staff
11	28 November 2007	Former Toronto and Region Conservation Authority (TRCA) staff
12	29 November 2007	TRCA staff
13	30 November 2007	Former Ministry of the Environment (MOE) staff
14	21 December 2007	York Region staff
15	10 March 2008	Consultant
16	9 June 2008	Markham resident
17	20 June 2008	Markham councillor
18	18 July 2008	York Region staff
19	18 July 2008	York Region staff
20	15 August 2008	TRCA staff
21	11 September 2008	Environmental NGO representative



(see Table 3) on the emergence of a more strategic approach to EA and environmental decision making between November 2007 and September 2008. Conducting in-depth interviews provides respondents with the opportunity to relate detailed explanations and provide clarification (Lewis, 2003). Employing semi-structured interviews allowed us to probe a consistent set of issues and hear a variety of perspectives (Berg, 1995; Hughes, 2002).

Snowball sampling (Patton, 2002) was used to identify additional key informants. Interview analysis was conducted using QSR NVivo, a computer-assisted qualitative data analysis software, in which transcripts were analysed to discover patterns, identify main themes, glean insight and develop meaningful conclusions.

Participant observation was used to produce empirical material on non-trivial phenomena in a 'natural context' (Alvesson and Skoldberg, 1999). This interpretation of participant observation 'assumes that knowledge develops from experience, particularly the experience of social-political action' (Newman, 2000: 24). The research team engaged participants in ten different forums from June 2007 to May 2009. These observations complemented the qualitative data collected during in-depth interviews.

The research team was provided unprecedented access to York Region's meetings on EA and land use planning, including Technical Advisory Committee meetings about both the Transportation Master Plan and the Water and Wastewater Master Plan, and internal and public meetings concerning the development of the York Region Sustainability Strategy. In addition, the research team was invited to participate, with York Region and conservation authority staff and consultants, in a chartering — or visioning — session of the Upper York Sewage Solutions (UYSS) EA project.

In addition, the research team hosted two workshops for case study participants. The first involved York Region staff and relevant members of the academic community, including experts on sustainability, EA, transportation and infrastructure planning. The focus of this workshop was on the key guiding principles that underpinned the region's sustainability strategy (York Region, 2007d). The second workshop looked at the integration of sustainability and SEA principles and practices into York Region EA and planning processes, and involved York Region staff and private consultants.

## Findings

Findings are structured in terms of activities in which York Region was involved that are considered to be related to SEA or have some characteristics and elements of it. It is interesting to note that, when the proposal that led to this research was written, regional authorities were unaware of the concept of SEA. Considering that this is York Region's story of

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## Considering that this is York Region's story of an approach that emerged from their history and particular circumstances, and not efforts to apply SEA theory *per se*, it is remarkable how closely the characteristics of this approach parallel the SEA literature in terms of its essential components

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an approach that emerged from their history and particular circumstances, and not efforts to apply SEA theory *per se*, it is remarkable how closely the characteristics of this approach parallel the SEA literature in terms of its essential components (e.g. early and proactive application, participative, adaptive, sustainability-centred, tiered and integrated decision making). The activities are described below in chronological order.

### *Development of sustainability principles to guide master planning and EA processes*

Traditionally, planning and EA in York Region have been influenced by what many would consider to be a pro-development culture. Growth and increase in population numbers have always pushed the agenda to 'develop and build more roads and more pipes' (interviews 2 and 11). To some extent, York Region has realized that there are limits to growing and developing in this manner (interviews 1, 2, 10 and 14). As a result, an explicit commitment to sustainability has been recognized as being essential to bringing important improvements in terms of what gets addressed and the overall way in which decisions are made (York Region, 2007d).

Our research also identified some tiering associated with the work York Region has completed on sustainability. This was initiated through the development of *Vision 2026: Towards a Sustainable Region*, an exercise to 'establish a strong vision for the future' (York Region, 2007b: 2). This process was somewhat unique in terms of public involvement and improved communication among the public, decision makers and other stakeholders involved (interviews 1, 3, 8, 10, 14 and 15). Improved dialogue during this process stimulated constructive collaboration with input from the general public, academia and other stakeholders during the Region's Sustainability Symposium, the Towards Sustainability in York Region (TSYR) Advisory Group and the Growth Management Public Engagement Initiative (York Region, 2007d).

To further 'translate the concept of sustainability into practical action,' the Region engaged in the de-

**Box 1. Sustainability strategy principles**

- Principle 1: Provide a long-term perspective on sustainability.
- Principle 2: Evaluate using the triple-bottom line elements of environment, economy and community.
- Principle 3: Create a culture of continuous improvement, minimizing impact, maximizing innovation and increasing resiliency.
- Principle 4: Identify specific short-term achievable actions that contribute towards a sustainability legacy.
- Principle 5: Set targets, monitor and report progress.
- Principle 6: Foster partnerships and public engagement.
- Principle 7: Create a spirit of stewardship, shared responsibility and collaboration.
- Principle 8: Raise the level of sustainability awareness through education, dialogue and reassessment.
- Principle 9: Promote sustainable lifestyles and re-evaluation of our consumption and expectations.

Source: York Region (2007d: 9)

development of the York Region Sustainability Strategy (York Region, 2007d: 2) (Box 1). The sustainability strategy was influenced by the Province of Ontario's growth management and conservation policies (e.g. Places to Grow Plan, Oak Ridges Moraine Conservation and Greenbelt Plans) and was used as a guiding document for both infrastructure master planning and upcoming project-level EAs. Academic input into the development of the sustainability strategy resulted from a workshop organized by the SEA research team in June 2007. The focus of the workshop was the development of sustainability strategy principles and criteria relevant to master planning for transportation and for water and wastewater.

The principles in the sustainability strategy were then further refined and adapted to the specific context of the master plan review and updating process for each type of infrastructure (i.e. transportation, and water and wastewater); the broad set of sustainability principles in the strategy were contextualized for each master plan and a set of criteria was developed for use during the review and updating process and during consideration and selection of preferred alternatives. This tiered process can be interpreted as having what the literature refers to as a 'trickle-down effect': proceeding from the vision developed for *Vision 2026*, to the generic sustainability principles in the sustainability strategy, to the specified sustainability criteria developed to guide the master plan update process and then down to the project level.

In addition, with the publication of York Region's Sustainability Strategy, integration of biophysical, social and economic dimensions can be facilitated, as the document is intended to guide all regional activities (York Region, 2007d). This is especially important for growth management planning and its infrastructure component in a region with restricted

land available for development. Focusing on integration can help reveal many opportunities in growth management planning, such as integrating transportation planning with land use planning<sup>3</sup> and urban design to minimize single-occupant vehicle trips while encouraging the use of an efficient public transportation system that reduces traffic congestion, pollution and resource use; and reducing water inflow and infiltration while taking measures to conserve water rather than just building one big pipe to handle the demand. These are emerging examples of links that are being made in practice between SEA and sustainability assessment.

Nevertheless, the SEA-type process in York Region still falls short by paying limited attention to broader issues such as equity and social well-being (other than housing affordability and access to transportation, for example). The translation of sustainability principles into context or sector-specific sustainability principles and criteria in the update processes of both the Transportation Master Plan and the Water and Wastewater Master Plan is certainly promising as a novel approach to formulating these plans. It is yet to be seen in practice how this document will, in the long run, influence regional planning and decision making, and how it will be filtered down to the project level. Nevertheless, these sustainability initiatives can be interpreted as a sign that York Region is striving to take the sustainability paradigm more seriously.

*Organizational changes to coordinate water, wastewater and transportation master planning under the York Region Sustainability Strategy*

Some interviewees criticized the previous wastewater master plan (i.e. 1997 YDSS Master Plan), indicating that the master planning process needed to be rethought in terms of the strategic nature and overall approach to address issues in a more conceptual, generalized and flexible manner (interviews 8, 11 and 14). Flexibility and adaptability are crucial components for an effective planning system, given all the different contexts of applications in terms of scale, tiers of decision making and sectors (Noble, 2005).

In the context of the York Region case, the previous master plans were too inflexible in terms of specific reference to projects and their location, and favoured large-scale engineering solutions leading to the YDSS project (interview 14). This foreclosed conservation and smaller-scale infrastructure alternatives at the project level.

Interviewees noted that the only viable alternatives, as a result of the Water and Wastewater Master Plan, were to minor routing alternatives to the 'big pipe' (interviews 2, 5, 11 and 14), leaving little space for discussion of alternatives at the project level. Interview respondents indicated that the issue of the foreclosure of alternatives needed to be revisited so that the goals and objectives of strategic

initiatives (e.g. official plans, master plans) could be addressed by evaluating all potentially reasonable alternatives (interviews 3 and 14). Recent evidence of this in York Region can be identified in the UYSS project (see following section), which had originally been conceived as a 'big pipe' project, that now provides opportunities to consider other reasonable alternatives, including dealing with reduction of inflow and infiltration, increasing water conservation and potentially building a smaller pipe. This evidence highlights the importance of a flexible, adaptive approach to SEA, as described in the literature (see, for example, Noble, 2005).

Additional evidence of a more integrated, collaborative approach to decision making in York Region is the recent simultaneous review and update of both the Transportation Master Plan and the Water and Wastewater Master Plan. This resulted in an attempt to have more effective communication and better coordination across these traditional institutional silos. These updated master plans have been used to update the Regional Official Plan and guide subsequent project-level EAs (interviews 1, 3, 10 and 15). In addition, both master plans developed specific sustainability principles that highlight and incorporate public involvement and the role of communicating with the public:

Transportation Master Plan sustainability principle 10: 'Further encourage communication, consultation and engagement: York Region will plan for and implement transportation infrastructure and services in an open, transparent and accountable manner based on broad consultation, citizen engagement and strong communications' (York Region, 2007e)

Water and Wastewater Master Plan sustainability principle 9: 'Communication, consultation and engagement: York Region is committed to planning and implementing water and wastewater services in an open, transparent and accountable manner based on broad consultation, citizen engagement, strong communications and to building public consensus toward the need to practice sustainability' (York Region, 2008d)

These criteria have increased public consultation and engagement with respect to master planning in York Region, which contribute positively to improved SEA processes and formative sustainability assessment (Gibson *et al.*, 2005; Noble, 2005).

#### *Ongoing Upper York Sewage Solutions EA*

In 2009, York Region initiated the Upper York Sewage Solutions (UYSS) EA project to identify practical and sustainable solutions to provide additional sewage servicing capacity related to forecasted growth in Upper York Region. York Region has re-

tained a consortium of consultants to complete the requirements of the EA process (interviews 10 and 14).

In September 2008, the SEA research team was invited to participate in the chartering session for the UYSS EA, which included representatives from York Region's Water and Waste Water, Transportation and Planning divisions and the consulting consortium. This session was meant to lay the groundwork for what is intended to be a new and more integrated, sustainability-oriented project EA. Meeting results demonstrated that the aforementioned York Region Sustainability Strategy, related growth management targets, and emerging water and wastewater and transportation master plans provided a context and overall guidance for the project. This is an example of a regional approach to tiered and more integrated decision making (Stinchcombe and Gibson, 2001; Arts *et al.*, 2005; Dalal-Clayton and Sadler, 2005; Jones *et al.*, 2005).

This effort also demonstrated the role of SEA as a communication tool (Vicente and Partidário, 2006) among key stakeholders (i.e. decision makers, planners, consultants and the public). By inviting members from different departments, as well as the SEA research team (which includes a member of a regional NGO) to participate in this initial session, York Region demonstrated some commitment to a more integrated, cooperative and transparent approach to environmental decision making. In addition, interviewees indicated that York Region has engaged in changing its approach to communicating with and engaging the public (interviews 1, 2, 3, 8, 10 and 15). Early and more frequent public consultations have recently become more common in York Region's activities, something that in the past many people, especially residents and NGO representatives, saw as a serious deficiency in York Region's planning and EA processes (interviews 6, 7, 16 and 17).

At the project level, 'constructive engagement'<sup>4</sup> has been used in several recent initiatives, resulting in what some interviewees perceive to be better outcomes (interviews 3, 10, 15 and 16). Engaging the public has been associated with increasing transparency in planning and decision making in York Region, as well as improving accountability and the relationship and communication with York Region staff, consultants and the interested public (interviews 6, 7 and 11). By engaging the public, different perceptions of the issues and resulting problems are integrated and constructive collaboration can be fostered, which ultimately contributes to the acceptance of the proposed solution (Vicente and Partidário, 2006).

In discussing the evolution of project EA in York Region, interviewees indicated that expectations regarding timing and costs of EAs have changed (interviews 3, 5 and 15). Interviewees noted that, in the past, project EAs were mostly done using a low-cost desktop study (interviews 3 and 6), with obvious

limited spatial, temporal and conceptual scope. The need to broaden these aspects has been identified as an important step in improving the overall planning and EA process in York Region (interviews 2, 14 and 18). This requires that, at the project level, more detailed background studies (i.e. hydrogeology in York Region's case<sup>5</sup>) be conducted, the acknowledgement that EA processes will probably 'take more than six months to be completed' (an embedded assumption of the past), and that a broadened conceptual scope take into account sustainability considerations found in the overall sustainability strategy principles and related master plans (interviews 2, 3 and 8).

York Region staff and consultants working on the UYSS indicated that these new approaches were integral parts of the UYSS project. With respect to the UYSS case, it can be interpreted that the particular tiered approach (strategic direction filtering down to the project level) is having positive impacts on the EA process in the early stage of project design. In addition, the UYSS project team has indicated that, on the basis of the sustainability criteria developed for the Water and Wastewater Master Plan, further specified criteria for the project itself will be developed and used in considering and assessing reasonable alternatives.

It was also indicated that staff and consultants working on the UYSS were taking into account strategic direction from the Oak Ridges Moraine Conservation Plan and other legislation, such as the Lake Simcoe Protection Plan.<sup>6</sup> It is, however, too early to evaluate the actual influence of these plans and legislation on the UYSS EA in terms of scoping and evaluation of alternatives, as (at the time of writing) the EA has only recently been launched.

During the joint workshop held between the SEA research and UYSS EA project teams to explore innovative ideas for application in EA processes, the idea of establishing a long-term standing advisory committee on EA in York Region was discussed, consisting of individuals involved in Oak Ridges Moraine planning and management to assist with interpretation. The potential benefits of bringing together on a long-term basis individuals with complementary knowledge of strategic planning, such as the Oak Ridges Moraine Conservation Plan and the Greenbelt Plan, was thought to be a useful idea; however, no such committee has been formed to date.

#### *Champions of sustainability and the current situation*

When trying to develop a culture of change such as that associated with advancing a sustainability agenda in an organization such as York Region, an individual(s) to champion the cause is required (interviews 10 and 17). Sometimes this will come from the chief administrative officer or even someone at a lower level in the organizational hierarchy. As one interviewee mentioned:

Cultural change in the organization is really critical. You've got to have champions, and it really does take leadership, because the organization will not change by itself. You've got to have the right level of people or series of people. (Interview 10)

In York Region, a number of champions emerged to deal with the fallout from the 16th Avenue EA and construction problems. They played a significant role in pushing a new agenda for a different approach to planning and EA in York Region (interviews 9 and 15). It is important to note, however, that at the time of writing this paper, most of these champions had moved within or left the organization, which raises doubts as to the continuity of the positive aspects of SEA in York Region.

### **Implications and recommendations**

Research findings indicate that York Region's approach to planning and EA processes appears to have recently changed to a more strategic, long-term, participative, integrated and tiered approach reflecting a commitment to sustainability. Opportunities for change appeared after problems were recognized during a project-level undertaking (Kirchhoff *et al*, 2010). As a response, potential solutions were explored at the strategic and project levels. Procedural and some structural changes can already be identified (e.g. tiered and integrated decision making, improved public involvement, development and application of sustainability criteria for decision making, improved communication among departments). Outcomes as a result of these changes are likely to take more time to identify. Nonetheless, the SEA-type approach described above in York Region offers some useful lessons and implications for SEA application. Below, we present six implications and corresponding recommendations:

#### *1. Better coordination between land use planning and EA processes*

The York Region case clearly demonstrates the value of SEA as a tool for fostering coordination and integration between land use planning and EA. York Region master planning is increasingly influenced by growth management strategies, regional land use plans and other legislation that provides strategic direction. Furthermore, regional land use plans, such as the Oak Ridges Moraine Conservation Plan, require EA processes to take into consideration strategic, as well as site-specific, information with respect to justification and need, scoping and assessment of alternatives (Government of Ontario, 2002: section 41). Municipalities are well positioned to enhance integration and coordination, as these organizations have the legislative responsibility for both land use planning and EA processes.

**Recommendation:** That municipalities actively work on integrating and better coordinating land use planning and EA processes by using SEA as a communication tool between planning and EA practitioners. The timing of land use plan reviews should be coordinated with infrastructure master planning processes. Furthermore, municipalities should work at better integrating and coordinating land use planning and infrastructure and EA departments.

### *2. Environmental assessment and sustainability-centred decision making*

The York Region case study illustrates the important role that sustainability principles can play at early stages in planning and EA processes. Gibson *et al* (2005) indicate that broad sustainability criteria need to be contextualized for application in practice. Broad sustainability visions (e.g. York Region's Vision 2026) can be refined (e.g. York Region Sustainability Strategy) for use in strategic planning processes such as master planning and through specific project-level sustainability criteria, as is taking place for the UYSS individual EA project.

**Recommendation:** That municipalities under moderate to significant development pressure with high demand for the provision of infrastructure services should adopt a sustainability approach by developing sustainability visions and strategies. The broad principles embedded in such strategic documents must then be contextualized for use in master planning and further specified for use at the project level.

### *3. SEA as a communication tool*

Once York Region staff members were exposed to the SEA concept, many actively used it to continue to improve communication between departments and to better integrate land use and EA planning processes. This research points to this aspect of SEA as having a particularly positive impact within the municipal context in terms of overcoming the silo mentality usually characterized by land use, infrastructure and EA departments.

**Recommendation:** That further applied research be carried out in a municipal context to explore the potential of SEA as a communication tool to better integrate EA and planning processes and to increase communication and collaboration between traditional departmental silos.

### *4. Active promotion of tiering*

The York Region case suggests that tiering has significant potential at the municipal level. Strategic and site-specific information from regional and provincial-level plans (e.g. Places to Grow, Oak Ridges Moraine Conservation Plan) is now influ-

encing and guiding project-level EAs (e.g. UYSS project). Furthermore, the sustainability principles discussed above are filtering down and becoming more contextualized at the project level.

**Recommendation:** That municipalities actively and explicitly work to encourage tiered decision making. Municipalities should extract strategic and project-level direction from progressive land use planning documents to guide master planning and subsequent project EA.

### *5. Improved transparency and meaningful public engagement*

The York Region case demonstrates an increased willingness to engage with the public, especially at the project level (e.g. UYSS EA) and some improvements in transparency and engagement at the strategic level. In fact, fostering public engagement is now one of the region's sustainability strategy principles. In addition, the region took some tentative steps by entering into a collaborative agreement with the STORM Coalition<sup>7</sup> and is contemplating setting up a long-term EA advisory committee.

**Recommendation:** That medium-sized and large municipalities work on establishing long-term EA advisory committees, comprised of individuals involved with land use planning, EA and other related activities (e.g. stewardship).

### *6. Need for long-term champions*

The York Region case clearly demonstrates the important role of champions in initiating and sustaining positive changes towards improved land use planning, EA and SEA. A group of committed planners and EA practitioners actively worked to improve York Region planning and EA processes. Unfortunately, most of them have moved on to different positions. The long-term implications of the role and loss of champions requires further study.

**Recommendation:** That an (S)EA advisory committee be established. Such a committee could be the retainer of contextual knowledge and succession planning and training. A type of 'champion succession planning' could also be fostered through this committee, by scouting for and training future champions.

## **Conclusions**

The purpose of this case-based, collaborative research project was to extend practical and theoretical understanding of SEA to the related, but in practice poorly coordinated, processes of project-level EA, master planning and regional land use planning.

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## The lessons learned from York Region's experience provide useful insights about integration and tiering in planning and decision making, especially in the context of growth management

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Many SEA conceptualizations focus on discrete, formal assessment of policies, plans or programmes following a EA-style protocol (e.g. Bass, 2005; EC, 2008; Fischer, 2007), and they also concentrate on the potential for EA principles and practice to improve planning and policy making processes (e.g. Hildén *et al*, 2004).

This research reveals that, in York Region, a voluntary, ongoing, communicative, tiered and integrated type of SEA was put in place. The lessons learned from York Region's experience provide useful insights about integration and tiering in planning and decision making, especially in the context of growth management. The descriptions of the activities in the Findings section suggest that York Region's approach to planning and EA processes appears to have shifted gradually from the traditional pro-development approach to planning and EA towards a broader, more strategic and sustainability-oriented approach.

One of the main benefits of SEA is its potential to set a strategic context for lower tiers of decision making, including project undertakings (i.e. tiering). In this sense, a vital role for SEA is to encourage procedural guidance to lower-tier assessments (Gibson, 1993; Stinchcombe and Gibson, 2001). Because of tiering, SEA has the potential to streamline decision making so that decisions taken at one planning level may not need to be revisited at subsequent stages of decision making (Thérivel, 2004), potentially reducing costs, time and confusion. As was the case in York Region, an SEA of a land use plan or infrastructure master plan has the potential to inform and guide the process or protocol for all subsequent project EAs, effectively changing the way a jurisdiction makes project-level decisions.

The research findings reflect Vicente and Partidário's (2006) conceptualization of SEA as an ongoing communication tool. SEA may be valuable as a vehicle for improved communication within a broadly defined regional governance structure. Furthermore, SEA should be characterized by the tiering of decision making with an emphasis on the development and contextualization of sustainability principles (i.e. specifying sustainability criteria to the particular circumstance, from the broad strategic level down to the project level).

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## Notes

1. In the 1990s, the Ontario government initiated amalgamations of several municipalities. This resulted in a two-tier municipal government structure in parts of Ontario. The upper tier (or regional government) has responsibility for regional-scale planning and the provision of infrastructure. The lower tier is responsible for land use decisions through development approval and zoning.
2. York Region spent CAN \$400 million in 2005 for water and wastewater and road infrastructure, and is estimated to spend \$3 billion over the next 10 years (York Region (2008g).
3. One of the sustainability principles used during the updating process of the Transportation Master Plan relates to the integration of transportation planning and land use planning (York Region, 2007e).
4. 'Constructive engagement' is the term used by Ogilvie, Ogilvie & Company, the firm hired to facilitate a few of York Region's projects. The five main principles of constructive engagement are: (1) respect for their concerns vs. as a necessary hurdle; (2) engage them vs. 'trying to smoke it past 'em'; (3) empower them with user-friendly information and education vs. confuse 'em with techno-babble; (4) value their opinions and accommodate their suggestions vs. 'hide their suggestions in the Appendix'; and (5) make sure our processes are open, transparent, informed and fair vs. one PIC [public information centre] from 6:00 to 9:00 on a 'holiday.' (Source: Ogilvie, Ogilvie & Company, <http://www.mobalizers.com/>).
5. As interviewee 1 mentioned, in the past York Region would spend limited resources on hydrogeology studies during the EA process. Now, 5% of the project cost is allocated to hydrogeology studies.
6. The Lake Simcoe Protection Plan is a watershed-based plan that provides a roadmap to help restore and protect the health of Lake Simcoe (MOE, 2010).
7. The Save The Oak Ridges Moraine (STORM) Coalition is focused on protecting the ecological integrity of the Oak Ridges Moraine in Ontario, Canada. Since 1989, STORM has been working at the local and regional levels to ensure that municipalities make good planning decisions that respect the environmental significance of the moraine and take into account its ecological and hydrological functions. In the process of working cooperatively, STORM and its member groups have established a relationship of mutual support and the sharing of information and resources that has been applied at both the local and regional levels.

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