Abstract

This report aimed to understand the reasoning that leads cities to undertake efforts to move towards sustainability. Interviews and surveys were undertaken with cities that are following the Framework for Strategic Sustainable Development and other models in moving towards sustainability to understand the motivators and drivers, the barriers and challenges, and the benefits that these cities have encountered and realized through the move to sustainability. The motivators and drivers, barriers and challenges, and benefits were categorized within seven forms of community capital – natural, economic/financial, physical/built, social, cultural, human, and political. Returns on investment were categorized, and those that were pronounced were highlighted. A guidebook has been developed to assist sustainability practitioners and sustainability leaders in cities to engage senior-level decision-makers with language that would encourage them to move towards sustainability.

Keywords: strategic sustainable development, urban sustainability, community engagement, drivers toward sustainability, barriers to sustainability, community capital
Statement of Contribution

This thesis is the product of a group dynamic and collaboration that has proven productive beyond our expectations. When we started out on this thesis in January 2009, we did not know how each of us worked, having not worked together prior to this project. The group members had a diverse set of educational backgrounds and personal experiences, and aptitudes. The dynamic of the group allowed each individual to bring their strengths and passion to this report. Responsibilities and tasks such as developing the project structure, contacting practitioners and city representatives for interviews, literature research, and interview transcriptions were distributed amongst the group members to allow each member to be actively involved at every step of the project. Making contacts with potential interviewees was divided amongst all three members, and with only a couple exceptions, all group members were present at the 32 interviews undertaken. The research design, literature reviews, written report and presentations were all carried out cooperatively.

Responsibilities and tasks were distributed fairly. Each member of the group brought their strengths to the report:

- All – data gathering and analysis: literature reviews, surveys, interviews, focus groups, case studies, and qualitative analysis
- Adrian Mohareb – written report duties and networking (researching, planning, outlining, writing, editing, formatting, tapping into networks to increase the breadth of the project)
- Kate Murray – research design and planning (development of goals, conceptualization, organization of research, overall development of questions and methods, data consolidation, drafting of report)
- Chidi Ogbuagu – presentation of results (presentation slides, report figures, graphic representations, tables)
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Executive Summary

Introduction

Cities are currently major contributors towards global unsustainability, as they contain 50% of the global population and 75% of the population of developed countries (United Nations 2007; United Nations 2008), and generate between 60 and 70% of global greenhouse gas (GHG) emissions (Satterthwaite 2008). Cities have a great potential to contribute towards global sustainability, and are often at the forefront of the sustainability challenge. The proximity of municipal governments to their citizens encourages them to be more responsive to citizen demands. Local governments can create the environment to reduce demand on natural resources, while at the same time strengthening the social networks that exist.

Cities are complex systems that require planning in order to meet the fundamental human needs of their citizens while mitigating impacts on ecosystems. One tool for planning in complex systems is the Framework for Strategic Sustainable Development (FSSD), which looks at decision making through a five-level framework described below.

At the **System Level**, the city resides within the technosphere, within the ecosphere. The residents of a city require materials that come from the ecosphere, and reside within human networks in the technosphere.

The **Success Level** describes the minimum conditions for a sustainable society, based upon four sustainability principles (SPs), which state that, “in a sustainable society, nature is not subject to systematically increasing:

SP1. …concentrations of substances extracted from the Earth’s crust;
SP2. …concentrations of substances produced by society;
SP3. …degradation by physical means; and

...In that society,

SP4. People are not subject to conditions that systematically undermine their capacity to meet their needs.

Cities can play a role in global sustainability by not contributing to violations of the four SPs.
The authors have chosen a community capital model (Hancock 2001; Roseland 2005; and Jacobs 2007), to envision returns on investment:

- **Natural Capital** – The ecological stocks and flows that provide a yield of valuable goods and services, as well as critical life support systems.
- **Physical/Built Capital** – Material resources that can be used to produce a flow of future income.
- **Economic/Financial Capital** – The allocation of resources and materials from which society can withdraw interest or income.
- **Human Capital** – The competencies of individuals that facilitate the formation of personal, social and economic well-being.
- **Social Capital** – The interpersonal interactions, networks and customs that contribute to stronger community fabric.
- **Cultural Capital** – Shared experience through traditions, norms, values, heritage, and history.
- **Political Capital** – The capacity of local municipal leaders to extend their authority, engage citizens and build local pride and trust.

At the **Strategic Level**, approaches to move towards sustainability can be chosen. Backcasting can be employed as a tool to envision a successful future that provides a systems view of a sustainable society while connecting short-term measures and long-term vision. Measures can be selected based on whether they move cities in the right direction towards sustainability, if they provide a flexible platform for future developments, and if they provide an adequate return on investment.

The community capital model allows cities to envision returns on investment through a wider lens. Strengthening the forms of community capital is most effective when municipalities take a systems perspective to sustainable development.

The **Actions Level** includes prioritized actions that can move global socio-ecological systems towards sustainability, including measures that diminish contributions to violations of the SPs, build capacity and monitor results.

At the **Tools Level**, cities select tools such as environmental budgets and indicators that can lead them towards sustainability. Indicators provide measures of progress, and can be linked to the SPs to demonstrate the broad range of impacts and interconnectedness of assets within a city.
Out of this research, a resource guide was developed that conveys the motivators and drivers, barriers and challenges and benefits of moving towards sustainability. Built from an understanding of the language that will encourage cities to move towards sustainability, it aims to convey the benefits experienced by cities in the forms of community capital.

Research Questions. The questions this report aims to address are:

Main question:

What are the specific returns on investment in the forms of community capital that cities are experiencing as they move towards sustainability?

Secondary questions:

- What are the commonalities amongst cities that are moving towards sustainability? Do they face similar motivators and drivers, barriers and challenges, and returns on investment in community capital in their progress?
- What are the similarities in community capital returns for cities that are using the FSSD to guide their measures towards sustainability? Do cities that use other models or frameworks to move towards sustainability experience different returns?
- How can these demonstrated returns be built into a resource for practitioners and sustainability leaders to engage cities in integrating sustainability into their core activities?
- Recognizing that every city is different, can this resource be applicable across all locations? If yes, how can the resource be flexible enough to present the community capital returns in a manner that is appropriate to any city?

Methods

The authors followed a four-phase process to produce this report and a resource guide for sustainability practitioners and champions to engaging senior-level officials in municipalities. In the first phase, a literature search was performed to gain a greater understanding of the drivers for and barriers to implementing sustainability in cities. At this stage, the community capital model was identified as a model for encouraging cities to progress towards sustainability, and sets of indicators for sustainability were analysed. In phase two, exploratory interviews were held with sustainability practitioners to gather their experience with encouraging cities to move towards sustainability, and to understand the drivers and
challenges encountered in different regions. In phase three, interviews were conducted with city officials working at various levels of municipal operations. A major goal of these interviews was to understand the benefits that cities have experienced as a result of their sustainability initiatives. More than thirty interviews were conducted in phases two and three, with a varied audience that had experience working in virtually all parts of the world. In phase four, the data collected from the interviews were analysed to determine whether cities were witnessing the benefits that were to be anticipating from a move towards sustainability, and to determine whether both practitioners and city officials were observing similar drivers and barriers. Cities were divided between those that were using the FSSD as a guiding framework for their progress, and those that were using other frameworks or working ad-hoc on sustainability.

The results of the interviews were incorporated into a resource guide for sustainability practitioners, highlighting the drivers and barriers to moving towards sustainability, and specific results that cities interviewed had achieved through their move towards sustainability.

**Results**

Motivators and Drivers. In this research, it was discovered that the cities contacted were moving towards sustainability proactively, rather than as a reaction to a crisis. There were several common responses for reasons for these cities to progress towards sustainability, such as: a desire to preserve local environmental and cultural heritage; to attract and retain citizens; to provide enhanced social services; and to foster citizen engagement and pride. It became evident that the main motivator was to provide a resilient city that offers a high quality of life for its citizens. As stated by Roseland (2005), human and political capital can both encourage and be enhanced by moving towards sustainability, through increased awareness, engagement and competency on sustainability.

Barriers and Challenges. Factors relating to human and political capital provided the greatest barriers. A lack of awareness of the meaning and the implications of sustainability amongst both citizens and municipal staff slows progress towards sustainability. Both practitioners and city officials stated that cities risk losing momentum towards sustainability if they do not strive to keep their citizens engaged on the issue.
Community Capital Returns on Investment. Benefits were divided into community-wide benefits and benefits to the municipal organization. Generally, cities responded positively to improved environmental performance at the community level, such as air quality, water resource availability, reduced ecological footprint, reduced exposure to climate and resource risks, increased waste diversion, increases in the number of green buildings, and increased use of public transit. Cities were less likely to respond positively to improvements in social sustainability, but most cities did note that there have been improvements in citizen engagement through community sustainability initiatives and a stronger culture of creativity and innovation. Financially, most cities responded that they had noted increases in revenue opportunities, while some responded that they had experienced greater resilience in their economies and higher employment levels.

At the municipal operations level, cities generally noted improvements in most areas surveyed, but especially on reduced energy costs in municipal buildings, reduced fleet vehicle and fuel costs, their ability to stay ahead of externally imposed legislation and taxes, increased internal decision making and collaboration, more cohesiveness and innovation in policy decisions and in long-term planning.

Cities that use the FSSD were more likely to note improvements in citizen health and quality of life, tourism market share, cost savings through project sharing, attracting and retaining citizens, and affordable housing opportunities. Cities that used other sustainability models were more likely to note improved water resource access, reduced ecological footprints, increased waste diversion rates, reduced exposure to future uncertainties and risks, and water and energy savings in municipal buildings.

Discussion

Motivators and Drivers/Barriers and Challenges. Motivators and drivers were sought to understand the forces behind the sustainability movements in cities. Challenges and barriers were assessed in order to develop support and evidence to overcome these issues. While financial considerations were expected to be among the largest driving forces (and for some cities they were), human and political capitals appeared to be both the strongest driving forces towards and biggest barrier against sustainability momentum in cities. This result reflects the fact that for sustainable city development to occur, the knowledge and efforts of residents and municipal staff are
essential. It also highlights the importance of citizen engagement and of democratizing the decision-making process within municipalities.

Returns on Investment. Cities experienced the full range of community capital returns on investment as a result of sustainability initiatives. Critical links between the forms of community capital were established, and it was discovered that successful and rewarding initiatives were often those which strengthened and nurtured multiple forms of community capital. The human, social, cultural and political capital areas received fewer positive results than the other community capital areas, likely since it is more difficult to measure these returns. Enhancing multiple forms of community capital was established as a means of increasing a community’s resiliency. An analysis of cities using the FSSD to move towards sustainability found that they were more likely to realize balanced returns on investments among community capitals compared to cities using other frameworks.

Resource Guide. The resource guide developed, aimed to demonstrate that measures to move cities towards sustainability can provide an adequate return on investment, by giving successful examples from other cities. Economic and financial returns are of particular importance to many cities, and therefore the language and the examples of the resource guide often veer towards sustainability measures that have had a positive financial return on investment. However, other returns on investment are also relevant, and foster community development.

Conclusions

Cities hold the potential to drive movement towards global sustainability with a mobilizing force of engaged citizens; an understanding of local issues; and by being centres for innovation and creativity. Global sustainability calls for a fundamental change in the way societies manage and govern urban centres. Many cities have already begun the process towards sustainability, and are discovering early rewards along the way for doing so. Future steps towards global sustainability will require that cities establish links between government, citizens and stakeholders as well as externally with other levels of government and neighbouring regions. Cities can contribute to a sustainable society by improving their own long term survival within a regional context. The results gathered through this thesis build a case for cities to consider sustainability and demonstrate the rewards to the community in forms of natural, physical/built, economic/financial, social, human, cultural and political aspects.
Glossary

**Backcasting:** The process of envisioning a future outcome, analysing potential measures to move towards that envisioned outcome, and then prioritizing relevant measures to reach that outcome (Robinson 1990).

**Barriers:** Defined herein as obstructions cities face in initiating sustainability measures.

**Challenges:** Defined herein as obstacles that cities encounter once already on their path towards sustainability.

**Community Capital:** Any type of resource or asset capable of producing additional resources within communities; the resources in a community that have the potential to be invested, saved, or used (Jacobs 2007).

**Cultural Capital:** The product of shared experience through traditions, customs, values, heritage, identity and history (e.g. arts, expressions of diversity) (Roseland 2005, 11).

**Drivers:** Defined herein as forces that compel a city to move towards sustainability, e.g. a crisis or a need.

**Ecological footprint:** A measure of human demand on the Earth's ecosystems. It represents the amount of biologically productive land and sea area needed to regenerate the resources a human population consumes and to absorb and render harmless the corresponding waste.

**Ecosphere:** The global ecosystem of planet Earth, and interaction between living and non-living components (Robèrt et al. 2007, 340).

**Economic/Financial Capital:** The allocation of resources and materials from which society can withdraw interest or income (Roseland 2005, 8).

**Framework for Strategic Sustainable Development (FSSD):** A five-level framework used to understand and plan progress towards a sustainable society, by using backcasting from sustainability principles to prioritize strategic actions (Robèrt et al 1997; Ny et al. 2006). It is built upon a generic framework for planning and decision making in complex systems utilizing five distinct, non-overlapping levels: (1) System, (2) Success, (3)
Strategic Guidelines, (4) Actions, and (5) Tools (Holmberg and Robèrt 2000).

**Green Buildings**: Buildings that reduce the impact of the built environment on human health and the natural environment by efficiently using energy, water, and other resources, protecting occupant health and improving employee productivity, and reducing waste, pollution and environmental degradation.

**Governance**: A concept that encompasses the collective decisions made across society, e.g. by the public sector, private sector and civil society, that make decisions that can affect others (Bell 2003).

**Government**: Public institutions vested with formal authority to take decisions on behalf of the community (Bell 2003).

**Human Capital**: The competencies of individuals that facilitate the formation of personal, social and economic well-being (e.g. health, knowledge, leadership). (Roseland 2005, 8)

**Indicator**: Partial reflections of reality that help society understand current conditions, formulate decisions, and plan strategies. (Meadows 1998, 1)

**Motivators**: Forces that encourage a city to enhance the forms of community capital before it is necessary; e.g. proactive movement.

**Natural Capital**: The ecological stocks and flows that provide a yield of valuable goods and services (e.g. forests, fish stocks, aquifers). Natural capital also refers to critical ecological life support systems (Roseland 2005, 5).

**Physical/Built Capital**: The stock of material resources that can be used to produce a flow of future income (e.g. equipment, hospitals, infrastructure) (Roseland 2005, 8).

**Political Capital**: The capacity of local municipal leaders to extend their authority, engage citizens and build local pride and trust (gained through cohesive and coherent policy decisions, and manifested in improved reputation) (Jacobs 2007).
**Social Capital**: The interpersonal interactions, networks and customs that contribute to stronger community fabric (e.g. community cohesion, tolerance, compassion, patience) (Roseland 2005, 9).

**Sustainability**: A state where the four sustainability principles are not violated (Robèrt *et al* 1997; Ny *et al* 2006).

**Sustainability Principles (SPs)**: Principles built upon scientifically rigorous, consensus-based, systems-level understanding that define the minimum conditions for a sustainable society. They state that, in a sustainable society, nature is not subject to systematically increasing…

SP1. …concentrations of substances extracted from the Earth’s crust;
SP2. …concentrations of substances produced by society;
SP3. …degradation by physical means; and

...In that society,

SP4. People are not subject to conditions that systematically undermine their capacity to meet their needs (Holmberg and Robèrt 2000; Ny *et al*. 2006).

**Technosphere**: The human system in which materials, products and their associated industries interact (Robèrt *et al*. 2007, 343).

**Triple bottom line**: Financial, social and environmental effects of a firm or organization’s policies and actions that determine its viability as a sustainable organization.

**Urban sprawl**: A pattern and pace of land development in which the rate of land consumed for urban purposes exceeds the rate of population growth and which results in an inefficient and consumptive use of land and its associated resources.
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1 Introduction

Global society is currently on an unsustainable path. Demand for energy, fibre, crops, meat and wild protein, construction materials, metals and water is, in many instances, beyond sustainable levels, and is generally rising due to both increases in population and per capita consumption (Hinrichsen et al. 2002; Bozon et al. 2007; WWF 2008, 1). Prior to the recession at the time of writing (2009), resource and commodity prices had been broadly increasing, reflecting resource scarcity and the challenge in meeting current global demand (RBA 2005; JBIC 2009). The risks to unique and already threatened systems, as well as the risk of extreme weather events from climate change and of large-scale shifts in the climate system are becoming better understood. It is evident that the potential impacts of climate change could be greater than anticipated and may be actualized sooner than expected (Smith et al. 2009; Hansen 2007; Pfeffer et al. 2009). Up to two-thirds of the global population could suffer from water stress by 2025 because of the impact of population growth, rural to urban migration, and rising wealth and resource consumption (Levinson 2008; Migiro 2009). There is rising concern over the stability and resilience of the economic, environmental and social systems on which society relies (Taylor 1994; Berkes and Folke 2000, 1-3). These increased pressures on social order and the ecosystem add urgency to the need to move society towards sustainability.

1.1 The Contribution of Cities towards Sustainability

1.1.1 Background

Cities are a crucial leverage point for moving society towards sustainability, as they contain more than 50% of global population (United Nations 2008), and 74% of the population of more developed countries (United Nations 2007). In addition, the world’s population has become increasingly urban, and is anticipated to continue to do so. Most of the world’s population growth through to 2035 is expected to occur in urban regions in the developing world (Cohen 2006). Globally, the urban metabolism consumes a disproportionate amount of natural capital, as the higher per capita consumption of developed country residents and the urbanization rates of these countries concentrate consumption in cities (Roseland 2005, 2-3).
When emissions are attributed to the location where products and services are consumed, cities are responsible for between 60 and 70% of global GHG emissions (Satterthwaite 2008).

Cities are often seen to be contributing towards increasing degradation of ecosystem services. Throughout the second half of the 20th century and the first decade of the 21st century, cities continued to move towards greater sprawl, sharper divisions within the social fabric, increasing environmental damage and further depletion of resources (Blassingame 1998). There is agreement that this urban development model is unsustainable, and leads to higher infrastructure costs; increasing traffic congestion; receding open space; impacts on public health; and stressful social patterns (Calthorpe 1989; Newman and Kenworthy 1999, 6-18, 346-347; Dunham-Jones and Williamson 2009, vi-vii; Park et al. 2008, 62-63).

In contrast, there is much potential for action towards sustainability in cities, as they concentrate the area over which people reside, and in doing so mitigate some demands on resources (e.g. fossil fuels, by offering easy accessibility to services and by offering multiple transportation modes) (Andrews 2008, Nuvolati 2009). The methods that local governments use to provide services and design public and private space, as well as other conditions both within and beyond their control, can create the environments that either install or eliminate barriers to meeting basic human needs, as defined by Max-Neef (1991).1 Cities and their residents are at the forefront of the sustainability challenge, because they contribute significantly to and feel the impacts from global and regional problems such as climate change, declining air and water quality, rising population, and social conflicts (Roseland 2005, 194; WCED 1987, 238-243).

1.1.2 How Cities Can Contribute towards Sustainability

Global sustainability calls for a fundamental change in the way societies manage and govern urban centres. A brief background of the history of cities moving towards sustainability is given in Appendix A. Each city experiences different geographical, resource, social and environmental pressures. Regardless of the vast differences between cities, they share

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many qualities that give them the potential to drive the movement towards global sustainability. These characteristics include: a mobilizing force of engaged citizens; an understanding of local issues; and a combination of governmental authority and policymaking influence (Portney 2003, 14; Roseland 2005, 190).

Mobilization towards sustainability can come from two areas (Nyoni 2009; Roseland 2005, 26-27). Firstly, engaged citizens can encourage grassroots activism on sustainability, and build awareness and demand for political action. Secondly, the municipal organization can drive sustainability by developing a strategic approach to integrate it into all operations and services. The focus of this research is on engaging municipal governments and utilizing the leverage that can be achieved through both senior-level buy-in and strong governance\(^2\) to move society towards sustainability.

Local governments are well positioned to demonstrate the necessity, the appeal and the practicality of moving towards sustainability (Roseland 2005, 193). Municipal governments have the political power and credibility to implement innovative initiatives and assign resources in alignment with unique local conditions (WCED 1987, 242). Local governments are the elected body closest to citizens, and are most likely to be sensitive to the environmental, social and financial concerns of their residents. They therefore play a crucial role as an organization accountable for decision making and planning for a sustainable future (Roseland 2005, 194). A city’s achievements in transitioning towards sustainability rely on broad citizen engagement and participation (WCED 1987, 242).

### 1.2 Cities as Complex Systems

Cities are complex systems that require planning in order to successfully meet the fundamental human needs of their citizens while mitigating their impact on ecosystems. There are many actors with different drivers that can either encourage or discourage cities in moving towards sustainability, including business and citizen special interest groups. Cities and

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\(^2\) Governance is used distinctly from government in this report. Government refers to public institutions vested with formal authority to take decisions on behalf of the community, whereas Governance is intended to encompass collective decisions made across society, e.g. by the public sector, private sector and civil society, that make decisions that can affect others (Bell 2003).
sustainability practitioners can guide the move towards sustainability and bring others along in the right direction using planning strategies for complex systems. This section will analyse one strategy, the Framework for Strategic Sustainable Development, and its application for cities.

### 1.2.1 The Framework for Strategic Sustainable Development

The Framework for Strategic Sustainable Development (FSSD) is a scientifically robust model for planning and decision-making towards sustainability in complex systems (Holmberg and Robèrt 2000). The FSSD is structured into five levels (Figure 1-1) to guide planning. It promotes a whole systems perspective, a shared vision of success, and uses backcasting. When an organization backcasts, it envisions a future outcome, analyses measures to move towards sustainability, and then prioritizes relevant measures to reach that outcome (Robinson 1990). It can be applied to a variety of systems (global, national, community, business, and individual) to direct them towards sustainability (Robèrt et al. 2002; Ny et al. 2006).

**Human society and its subsystems within the ecosphere:** Basic operations of human society, natural laws, relationships and feedback loops.

**Conditions that define success of the planning process:** Elimination of contributions to the violation of sustainability principles.

**Strategic guidelines:** Principles for selecting actions that will lead towards success (Level 2).

**Concrete actions:** Actions following from the guiding principles that will help bring the system towards sustainability.

**Tools and concepts:** Measurement or planning tools that help support, measure, monitor or implement actions.

*Figure 1-1. Framework for Strategic Sustainable Development*
1.3 The FSSD and its Application to Cities

Given the complexities involved in city planning, the FSSD offers a strategic and whole systems approach to decision-making (Broman et al. 2000). One of the goals of this project is to examine cities that have adopted the FSSD and the sustainability principles to determine the returns and benefits the framework gives these cities (Section 3.4). Cities using other frameworks towards sustainability will also be analysed to determine if there is a difference in the successes that these cities have achieved.

1.3.1 System Level

The **System Level** includes a whole systems perspective to highlight the dynamic relationships between and within society and the ecosphere\(^3\). This emphasizes the need for sustainability to occur at every point in the global system (Holmberg et al. 1996). This level requires an understanding of the basic conditions within which ‘society in the ecosphere’ operates, such as the laws of thermodynamics and of conservation of matter and energy, biogeochemical cycles, basic ecology, photosynthesis and the importance of diversity. It also includes social systems such as institutions, networks, and society’s interdependent pursuit of the fulfilment of human needs.

For this report, the system under analysis is the city within the technosphere\(^4\), which resides within the ecosphere (Figure 1-2). A city’s boundaries are defined by the extent to which it can influence and change the systems in which it operates. This scope is sufficient for a whole system perspective of sustainability in a city, including environmental, social and economic aspects.

Cities are multifaceted systems, which provide a wide array of services that vary both internationally and within countries due to different municipal structures. The city system should include these myriad organisations and structures, the people involved in city operations, its institutions, and its

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\(^3\) The ecosphere is defined as the global ecosystem of planet Earth, and the interaction between living and non-living components (Robèrt et al. 2007, 340).

\(^4\) The technosphere is the human system in which materials, products and their associated industries interact (Robèrt et al. 2007, 343).
relationships with internal and external stakeholders, and indeed the global socio-ecological system.

![Diagram: Ecosphere, Technosphere, City]

Figure 1-2. Cities and the systems in which they exist

1.3.2 Success Level

The **Success Level** describes the minimum requirements for a sustainable society, through a set of scientifically robust Sustainability Principles (SPs), derived from a consensus-based system-level understanding (Holmberg et al. 1996; Robèrt 2000; Holmberg & Robèrt 2000; Ny et al. 2006). These principles state that, “In a sustainable society, nature is not subject to systematically increasing:

- SP1. ...Concentrations of substances extracted from the Earth’s crust;
- SP2. ...Concentrations of substances produced by society;
- SP3. ...Degradation by physical means;

and, in that society,

- SP4. ...People are not subject to conditions that systematically undermine their capacity to meet their needs.”

To ensure that an organization is moving towards sustainability, one of the tasks is to define a concrete vision of success. In this case, a definition of a sustainable city would help to provide that vision. For a city to either become independently sustainable or contribute to global sustainability, it
must eliminate its contributions to the violation of the four SPs. A shared definition of sustainability acts to inspire and engage citizens, provides a common language with which to build programs and develop strategies, and allows a municipality to monitor its progress (AUMA 2006, 25-26).

Each city has unique challenges and geographical situations, and has different amounts of capital from which it can draw. Therefore, the path for each city towards sustainability will necessarily be distinct. A whole system view of success is needed, as it is likely impossible to have a sustainable city in isolation from the regional and global systems within which it exists (Nyoni 2009; Greenhow 2009; Portney 2003, 17; Blassingame 1998). Due to the concentration of citizens in a small area in most cities, it is a major challenge to meet the needs of residents within that city’s boundaries, particularly food, water and energy needs (e.g. subsistence). A city is therefore very likely to be dependent on the resources of surrounding regions, and many other parts of the planet, in order to achieve sustainability. At best, a city can be expected to contribute to global sustainability, since a city is extremely unlikely to achieve sustainability on its own due to constraints in space and resources.

Community Capital. A city that is successfully moving towards sustainability will be enhancing multiple forms of capital. Hancock (2001), Roseland (2005) and Jacobs (2007) have outlined the types of community capital that cities aim to build: natural, physical, economic, human, social, cultural and political. Cities that are working holistically to build community capital are more likely to be resilient. Those cities with strong social capital, for example, are likely to be creating fewer barriers to having fundamental human needs met (Park et al. 2008, 11, 29-33). The forms of community capitals are the assets in a community or city that have the potential to be a resource in which cities can make investments, savings or withdrawals (Jacobs 2007). All forms of capital are present to varying degrees in cities. The seven forms of community capital can be defined as (Hancock 2001; Roseland 2005, 4-12; Jacobs 2007):

Natural Capital – The ecological stocks and flows that provide a yield of valuable goods and services (e.g. forests, fish stocks, aquifers). Natural capital also refers to critical ecological life support systems.

Physical/Built Capital – Material resources that can be used to produce a flow of future income (e.g. equipment, hospitals, infrastructure).
Economic/Financial Capital – The allocation of resources and materials from which society can withdraw interest or income.

Human Capital – The competencies of individuals that facilitate the formation of personal, social and economic well-being (e.g. health, knowledge, leadership).

Social Capital – The interpersonal interactions, networks and customs that contribute to stronger community fabric (e.g. community cohesion, tolerance, compassion, patience).

Cultural Capital – Shared experience through traditions, norms, values, heritage, and history (e.g. arts, expressions of diversity).

Political Capital – The capacity of local municipal leaders to extend their authority, engage citizens and build local pride and trust (gained through cohesive and coherent policy decisions, and manifested in improved reputation).

1.3.3 Strategic Level

At the Strategic Level, an approach to select steps towards success is developed (Holmberg and Robèrt 2000; Ny et al. 2006). Backcasting can be employed as a planning tool where a vision of success is created, and strategic moves are undertaken to lead towards this vision (Holmberg and Robèrt 2000). It differs from forecasting in that backcasting does not dwell on constraints of historical and present limitations (Dreborg 1996). Planners can use backcasting in combination with a strategic method of selecting actions to avoid blind alleys and generate resources for future measures. Backcasting can be applied to a vision of a sustainable city that does not contribute to violations of the SPs (Holmberg and Robèrt 2000). A key strategic tool that can complement backcasting from SPs used in the FSSD is known as the A-B-C-D (Robèrt 2000). The A-B-C-D tool helps communicate sustainability, so that people can more easily grasp the concept and become involved (Holmberg and Robèrt 2000; Ny et al. 2006). The A-B-C-D process involves developing a common awareness of the system and of sustainability, understanding the current reality, creating a vision of success and solutions that will lead to that vision, and prioritizing those measures.
A set of strategic guidelines can help prioritize short-, medium-, and long-term actions towards sustainability. Under the FSSD, the following three questions are used to guide prioritization (Robèrt et al. 2002; Robèrt et al. 2007, 49):

1. Is this measure a step towards the vision, bound by the SPs?
2. Can the measure be a flexible platform for future development towards the vision?
3. Does the measure provide adequate return on investment to seed future enhancements towards the vision?

One of the major aims of municipal governments is to offer residents a high quality of life, a healthy environment, and a diverse economic setting supporting local enterprises, all within their financial constraints (Ticknor and Associates 2008; City of Sydney 2008; City of Calgary 2009). Demonstrating financial returns on investment as a result of sustainability initiatives is crucial to generating support for future initiatives. However, the motivators used to engage a city in moving towards sustainability will necessarily be broader than a financial case, given the complexity of cities.

The seven forms of community capital can provide valuable resources for cities moving towards sustainability (Roseland 2005, 4). Strengthening these seven forms of capital is a critical component of a city moving towards sustainability and requires the municipality to take a whole systems perspective (Roseland 2005, 12). This report seeks to demonstrate to cities how measures that add to these interrelated forms of capital will lead to sustainability for their communities. Cities can use community capital to frame their returns on investment, to give them a new language surrounding returns on investment, moving the focus away from solely a financial return to one that considers different forms of return. Cities that have further developed the seven forms of capital can reinvest this capital to continue on the path towards sustainability.

1.3.4 Actions Level

The Actions Level includes all prioritized actions taken that will strategically move the global socio-ecological system towards the vision, in compliance with the SPs. Actions that move cities towards success and that conform to the strategic guidelines established at the Strategic Level can then be selected (Robèrt et al. 2007, 43-44). Actions can include tangible
measures that diminish contributions to violations of the SPs (e.g. green purchasing policy), capacity building (e.g. community dialogue), and monitoring of results.

### 1.3.5 Tools Level

The *Tools Level* incorporates any techniques, measurements, monitoring and management approaches relevant to assist movement towards or maintenance of sustainability. Strategic tools improve the likelihood of achieving success and facilitate the measurement of system performance to ensure actions are moving towards compliance with the SPs (Robèrt et al. 2007, 44-45). Tools such as environmental budgets (Växjö Kommun 2006) and indicators (Clarkson et al. 2008) can help cities move towards compliance with their stated goals by providing benchmarks towards success (Robèrt et al. 2002).

*Indicators for Sustainable Cities.* Indicators can be used by cities moving towards sustainability as a tool to measure their progress. Several sets of indicators of progress have already been developed for cities. In the United Kingdom, Forum for the Future has published reports ranking the 20 largest urban centres on their progress over the past two years (Cowley et al. 2007; Clarkson et al. 2008). Corporate Knights has put together an increasingly complex analysis of the state of Canadian cities each year since 2007 (Law and Bowman 2007; Shin et al. 2008; Shin et al. 2009). SustainLane (2008) has undertaken a similar effort for cities in the United States. Cities globally are adopting indicator sets to monitor and report on their progress towards sustainability, and to measure how they are reducing their contribution to violations of the four SPs. Table 1-1 demonstrates several of the areas where a city moving towards sustainability may wish to monitor, and the links between these indicator areas and the SPs.

*Table 1-1. Some common indicators outlining a city's progress towards sustainability, and their links to the SPs.*

<table>
<thead>
<tr>
<th>Indicator Area</th>
<th>Related Sustainability Principles</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>SP1</td>
</tr>
<tr>
<td>Lower per capita energy consumption</td>
<td>✓</td>
</tr>
<tr>
<td>Smaller environmental footprints</td>
<td>✓</td>
</tr>
<tr>
<td>Reduced transport demand/commuting times</td>
<td>✓</td>
</tr>
</tbody>
</table>
Cities can choose indicators that build towards the desired outcome of sustainability, and that evaluate the effect of their initiatives in a broad range of areas such as environmental impact, quality of life, future-proofing, economic security, governance and empowerment and infrastructure and built environment (Clarkson et al. 2008; Shin et al. 2009). Indicators can prompt action and are a useful tool for municipalities to communicate transparently to citizens their progress towards sustainability (Roseland 2005, 212). For instance, cities that are ranked highest in sustainable city indicator reports are assumed to be furthest along in their progress towards sustainability, and are expected to have witnessed early benefits and returns on investments. Figure 1-3 links select indicators with the SPs with the forms of community capital, and outlines how these tools can be combined to assist it city in moving towards sustainability.

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5 Future-proofing is defined as the level of preparedness of a city for the future and its readiness to respond to the challenge of sustainability. Indicators related to a city’s measures to future-proof itself include: the local authority’s commitment to managing for climate change; green businesses per capita; the proportion of the city’s area that is favourable to biodiversity; and its waste diversion rates (Clarkson et al. 2008).
Figure 1-3. Progressing towards sustainability by incorporating the four sustainability principles with the seven forms of community capital

Resource Guide. A resource guide for sustainability for cities could assist sustainability practitioners and leaders, in outlining the successes achieved when cities take a strategic approach to sustainable development, and have a cohesive, integrated vision and definition of sustainability. The demonstrated results should encourage cities to elaborate their vision of a sustainable city in order to backcast and strategically prioritize actions in a manner that engages its population. It will also provide cities with an understanding of how to overcome barriers of mindset. One of the goals of this research is to develop a tool to support decisions at the Strategic Guidelines Level.

It is crucial that practitioners who wish to engage senior level officials use language appropriate to the city’s specific situation (Clarkson 2009; Ezechiel 2009; Lahti 2009; McGinnis 2009; Willard 2009). The city’s financial resources and its structural capacity to encourage public buy-in will be major determinants to its potential to initiate investments in sustainability and the long-term viability of the initiative. An evidence base for sustainability for cities could provide an incentive for those cities that
are still working with a conventional view of society’s impact on the ecosphere, i.e. that violations of the SPs are not systematically increasing, to change towards sustainable form, function and communities. The resource guide for sustainability for cities will consider social, natural, economic, built/physical, human and cultural return on investments as well as financial returns. The political capital benefits of sustainability measures, particularly from engaging a variety of stakeholders (Jacobs 2007; Greenhow 2009; Clarkson 2009), will also be discussed.

1.4 Research Question

The main research question for this report is: **What are the specific returns on investment in the forms of community capital that cities are experiencing as they move towards sustainability?**

1.4.1 Sub-Questions

In order to answer this question, there are several sub-questions the authors aim to address:

- What are the commonalities amongst cities that are moving towards sustainability? Do they face similar motivators and drivers, barriers and challenges, and returns on investment in community capital in their progress?
- What are the similarities in community capital returns for cities that are using the FSSD to guide their measures towards sustainability? Do cities that use other models or frameworks to move towards sustainability experience different returns?
- How can these demonstrated returns be built into a resource for practitioners and sustainability leaders to engage cities in integrating sustainability into their core activities?
- Recognizing that every city is different, can this resource be applicable across all locations? If yes, how can the resource be flexible enough to present the community capital returns in a manner that is appropriate to any city?
1.5 Expected results

The authors expect that municipalities moving towards sustainability will have already experienced some benefits, especially within their municipal operations. Internally, the municipal organization is managed comparably to corporations (Greenhow 2009). Therefore, municipal operations are expected to achieve benefits similar to the seven elements of a business case for sustainability outlined by Willard (2005, 130), including: reduced recruiting costs; reduced attrition costs; increased productivity; reduced expenses in manufacturing; reduced water, energy and consumables expenses at commercial sites; increase revenue and market share; and reduced risk/easier financing.

In relation to the wider community, a variety of community capital returns experienced, depending on the initiatives and model/framework cities utilize for moving towards sustainability. Municipalities which have adopted the FSSD as a framework for progress are expected to have experienced returns on investment in a balanced manner, representing all forms of community capital, as a result of a whole systems perspective achieved by backcasting from a vision constrained by the four sustainability principles. It was expected that the benefits cities had achieved would mirror the benefits outlined by the Resort Municipality of Whistler (Whistler 2020 2006):

- Fostering a culture of innovation and creativity;
- Avoiding increased costs for resources or waste management;
- Staying ahead of new environmental laws or taxes;
- Strengthening the municipality’s reputation, increasing loyalty, and improving stakeholder relations;
- Retaining employees and increasing productivity, as well as increasing meaningful citizen engagement and participation;
- New revenue opportunities and increased market share; and
- Reducing exposure to future uncertainties and risk.

The authors expect to gather a broad assortment of motivators and drivers and barriers and challenges for cities moving towards sustainability. Despite the differences between cities, the authors expect that based on the wide range of cities and practitioners interviewed, that the resource guide developed would be applicable across multiple locations.
2 Methods

This research was undertaken to develop an understanding of the motivators and drivers pushing cities towards sustainability, the barriers and challenges encountered on this progress, and the benefits that cities can realise as a result of implemented sustainability initiatives. From this list, the authors’ objective was to build a resource guide for sustainability practitioners,\(^6\) with the intent of the guide being a tool to engage senior level officials\(^7\) in the process of moving towards sustainability. The following sections describe the methodology and approach utilized to generate results and meet the objectives of this research.

2.1 Research Approach

The research for this project was split into four phases (Figure 2-1). These phases are described in Sections 2.2 to 2.5.

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\(^6\) Sustainability practitioners are defined as either independent sustainability consultants external to a city’s municipal operations but working to engage senior level officials of cities or, employees in the sustainability departments within a city’s municipal operations.

\(^7\) City officials are defined as senior employees of sustainability departments within a city’s municipal operations, senior level municipal government officials in positions of authority, or politicians.
2.2 Phase One – Literature Search and Review

A multi-resource literature review was conducted to justify the need for this research and to demonstrate its uniqueness. The review informed the authors’ understanding of the broad concepts associated with cities and their operations. A literature search of articles in peer-reviewed journals, research of academic publications, books and on-line publications was carried out to discern patterns and guide the understanding of the links between the current reality of cities and the sustainability efforts that are being employed. Of particular interest was literature that explored the community capital model and the potential benefits to community capital that can come from sustainability measures (e.g. Hancock 2001; Roseland 2005, 1-12; Jacobs 2007).

Indicators for sustainable cities were also of significant use. The authors considered three indicator sets (Clarkson et al. 2008; SustainLane 2008; Shin et al. 2009) to become familiar with the language that cities and those measuring the progress of cities employ around sustainability so that approaches to practitioners and cities used the appropriate communication. Indicators were also used to gain an understanding of how cities and practitioners are monitoring progress towards sustainability and what benefits are believed reflect progress. This approach assisted in establishing a baseline for communicating with cities at their current level of understanding around sustainability. This literature provided the foundation for categorizing the benefits that cities realize when they integrate sustainability in their core activities and operations.

The literature review also aided in identifying gaps in the authors’ knowledge of engagement strategies for moving cities towards sustainability. By analysing these gaps and developing a methods matrix to address primary and secondary questions, the authors were able to derive actions that would be most appropriate for their research. This process enabled the authors to scope the report and produce questions to external practitioners that would help complete their understanding of past and current city engagement strategies as well as identify drivers and barriers cities face on the path to becoming sustainable.
2.3 Phase Two – Exploratory Interviews with Sustainability Practitioners

The interviews with sustainability practitioners addressed gaps in the authors’ knowledge of engagement strategies towards sustainability both at the municipal government level and at the community level. The interviews provided information on the motivators and drivers, barriers and challenges, and benefits witnessed by cities through their steps towards sustainability. The authors sought to become familiar with the current reality for sustainability practitioners working with municipalities. Understanding the context and the perceived drivers and challenges towards engaging cities in a move towards sustainability enabled the development of a comprehensive resource guide that can serve as a tool to help practitioners address the barriers and highlight the drivers. The exploratory interviews helped the authors to structure and scope the questions for the inquiries to municipal government officials, to improve the quality of the data provided for both this report and the resource guide. Table B-1 in Appendix B contains the list of interviewees among sustainability practitioners.

To guide and focus the interviews with sustainability practitioners, six questions were developed to structure the inquiries (Appendix CC). Sustainability practitioners were chosen by researching the organizations with experience in leading cities towards sustainability. Interviewees with a variety of backgrounds and experiences were sought to limit biases and to gain a more broad understanding of the issues investigated (Maxwell 2005, 93). The practitioner interviews lead to the identification of other practitioners and of appropriate contacts within cities.

2.4 Phase Three – Interviews with City Officials

The aim of the interviews with city officials was to collect information that identified the motivators and drivers, as well as the challenges and barriers, experienced by cities that are moving towards sustainability. The results were analyzed to discern common success patterns and trends. The results of the sustainability efforts of municipalities were of primary interest, most notably the returns they achieved, expressed in forms of community capital.

Cities studied in this report were divided into two categories: cities using the FSSD to guide their implementation, and cities using other models or
frameworks to move towards sustainability. This study has focused on cities that have already begun sustainability initiatives, as they provide clear examples of how to overcome the barriers to implementing sustainability. They also provide data on the benefits cities have achieved as a result of sustainability initiatives. Cities early in the move towards sustainability were of interest, as they can provide an understanding of the barriers and challenges for both municipalities and practitioners. Understanding the existing barriers assisted in the creation of a resource guide that addresses the obstacles to garnering support and buy-in from senior level officials. A comparison was conducted between the two categories of cities to determine the differences in community capital returns on investment.

To guide and focus the interviews with city officials (Table B-2, Appendix B), six questions were designed to structure the inquiries (Appendix D). In addition to the interviews, city officials were requested to fill in an online survey that listed the potential benefits their city may have achieved as a result of sustainability initiatives (Appendix E). This survey was built upon an understanding of some of the indicators that demonstrate a city’s moves towards sustainability (Section 1.3). The online survey was completed prior to the interview, and the results guided the discussion and allowed the authors to probe deeper into each recognized benefit. Since many cities adopt indicators specific to their municipality to monitor their progress towards sustainability, the authors considered indicators to ensure that the survey was built on a common language, considered a whole systems perspective and was appropriate to the measures motivating and driving cities towards sustainability.

Cities were identified through discussions with sustainability practitioners and from recognized personal contacts of the authors. Some information about each city is available in Table F-1 in Appendix F.

Results were collected through both anecdotal evidence as well as quantitative benefits, expressed as improvements in performance (e.g. percent reduction in GHG and air pollutant emissions or water usage) or as savings or increased revenue, as identified by senior level officials. The justification for collecting information from municipalities using a variety of sources and methods (interviews, surveys, case studies) was to reduce the risk that the conclusions will be limited by the flaws of a single data set or single type of source (Maxwell 2005, 93). A goal of this research is to collect detailed and varied data so as to provide a full and true picture of the current reality (Maxwell 2005, 112).
2.5 Phase Four – Data Analysis and Feedback from Expert Panel

The information collected through interviews, surveys and case studies was largely qualitative. This section describes the methodology used for analysing and interpreting results.

Interviews with sustainability practitioners and city officials were transcribed. Relationships between ideas were established within each group of interviewees to categorize the results. The goal was to fracture the data and rearrange ideas into categories that facilitate a comparison (Maxwell 2005, 111). Identifying broad themes and issues allowed data to be extrapolated to identify commonalities in motivators, barriers and community capital returns from moving towards sustainability. The barriers and challenges identified were analysed to assess what evidence would be convincing for integrating sustainability into a municipality. This evidence was further supported through the data gathered during interviews with senior-level officials regarding the returns they are achieving from their sustainability measures. It is the authors’ intention that this list of benefits can be used by practitioners and by sustainability leaders within cities as a tool for engaging city leaders towards sustainability.

The analysis involved a quasi-quantitative technique of statistical analysis to understand how or if the results identified typical and prevalent themes among interview and survey respondents. The authors applied this analysis technique to assess the amount of evidence in the data set, which supports a particular conclusion (Maxwell 2005, 113).

The evidence was then built into a resource guide that elaborates the benefits of moving towards sustainability, assisting practitioners in engaging municipal decision-makers to create policies that reduce the contribution of their city to violations of the sustainability principles.

2.5.1 Creating a Resource Guide

A product of this research, beyond this report, is a resource guide for sustainability practitioners, both internally and externally to municipal operations, highlighting the returns on investment for the seven forms of community capital that have been experienced by municipalities already
moving towards sustainability. It has been built from the anecdotal evidence generated from interviews, surveys and questionnaire responses.

The resource guide for sustainability for cities (Appendix GG) is a tool designed for practitioners and which incorporates the quasi-quantitative data (Maxwell 2005, 95-99, 113) from interviews with case studies and the language to assist them in making a convincing case to municipal decision makers. The list of benefits should create a robust, compelling argument for sustainability and address concerns regarding the perceived negative impacts, especially financial concerns, of moving cities in this direction. This resource guide would ideally aid sustainability practitioners in changing the way municipal governments approach sustainability, and be a tool for them to encourage municipal leaders to work with citizens and key stakeholders to implement legislation and projects that further their city’s progress towards sustainability. The authors hope that the result is a platform for further research into better strategies for engaging stakeholders to move cities towards sustainability.

**Target Audience.** This resource guide is directed towards sustainability practitioners who work with cities, and key individuals working in city governments on sustainability. The resource guide for sustainability for cities is intended to assist these individuals in building a case for increased resources and support for sustainability measures. Both of these groups will be able to use the benefits as a way to engage senior level officials working in municipalities. The reference guide should provide a tool to those looking to leverage the capacity of key decision-makers for change, and to build sustainability capacity amongst those key decision makers.

To rule out the possibility of misinterpreting the responses from interview participants, the authors solicited feedback from participants regarding the findings. As well, an expert panel, consisting of many of the sustainability practitioners contacted in Phase Two of the work, reviewed the first draft of the resource guide for content and for clarity (Maxwell 2005, 112). Expert panel members are listed in Table B-3 in Appendix B. The feedback received from the panel aided in adapting and strengthening the results, which were included in the final iteration of the resource guide for sustainability practitioners (Appendix G).
3 Results

3.1 Motivators and Drivers towards Sustainability

‘Some people change when they see the light; others when they feel the heat’

- Caroline Schoeder (Icon Group 2008, 22)

Many cities globally are beginning their transition towards sustainability. The reasons a city decides to integrate sustainability into its operations vary depending on geographic, economic, social and political situations. However, many commonalities can be identified amongst these cities. The authors have chosen to distinguish between motivators and drivers. The authors approach motivators as forces that encourage a city to enhance the forms of community capital before it is necessary, i.e. those that encourage proactive movement. In contrast, drivers were assessed as forces that compel a city to move towards sustainability, through crisis or need. This section will present the varied motivators and drivers that spark progress towards sustainability in cities.

The authors were able to capture many of the motivators and drivers for cities to move towards sustainability through interviews with 17 cities and 13 sustainability practitioners (Table B-1; Table B-2). It is recognized that this is a broad assessment of all the potential motivators and drivers; the individuality of each city’s situation will create different and occasionally unique drivers that the authors may have been unable to identify.

3.1.1 Natural Capital

Interviewees noted that the opportunity to enhance local and global natural capital, or to mitigate demand on natural capital, could act as a significant motivator or driver for sustainability within cities (Kruger 2009; Leung 2009; McGinnis 2009). The following examples demonstrate the forces that pushed cities to reduce their impact on natural capital:

- Canmore, Sydney and Whistler were motivated to develop sustainably because of geographical constraints (Caudill 2009; Jose 2009; MacKay 2009);
Falkenberg, Kingston, Nillumbik and Stockholm were motivated to preserve and protect their local environmental heritage (Andersson 2009; MacLatchy 2009; Johnson 2009; Ahlberg 2009);

Dublin, Karlskrona, Pickering, Toronto and Whistler were motivated to reduce reliance on unsustainable energy and fuel sources (Gleeson and Kofoed 2009; Wälitalo 2009; Melymuk et al. 2009; Bekkering 2009; MacKay 2009) and

Dublin, Karlskrona, Pickering, Stockholm and Toronto all drove to reduce greenhouse gas (GHG) emissions (Gleeson and Kofoed 2009; Wälitalo 2009; Melymuk et al. 2009; Ahlberg 2009; Bekkering 2009)

Halifax, Karlskrona, Nillumbik and Sydney were driven to become more sustainable by external forces, including vulnerability to the effects of climate change (drought, floods, resource availability, fires, and storms) (Deacoff and Townsend 2009; Wälitalo 2009; Johnson 2009; Jose 2009). Some practitioners also noted that major environmental impacts could drive cities towards sustainability (Kruger 2009; Klasson 2009). For example, the City of Calgary was driven towards sustainability by a need to overcome an environmental disaster (Ascroft 2009).

### 3.1.2 Physical

The built environment of cities creates motivators and drivers to move towards sustainability (McGinnis 2009). Canmore and Pickering demonstrated their motivation to become more sustainable through an interest to transform their current unsustainable urban form (e.g. urban sprawl and segregated zoning) into sustainable, living cities that have greater accessibility for residents and are more efficient and attractive for citizens (Caudill 2009; Melymuk et al. 2009). As well, Canmore, Madison, Pickering and Växjö were motivated to collaborate with developers to produce more efficient physical infrastructure, to overcome a lack of regulation in building codes from higher levels of government (Caudill 2009; Statz 2009; McGinnis 2009; Nilsson 2009). Madison and Pickering were motivated by a desire to implement new sustainable regional development plans (Statz 2009; Melymuk et al. 2009). In Canmore, Whistler and Sydney, sustainable development was driven by land development constraints to address growing population and limited geography (Caudill 2009; MacKay 2009; Jose 2009).
3.1.3 Economic/Financial

Ezechieli (2009), Greenhow (2009), Harrington (2009), Klasson (2009) and Kruger (2009) highlighted that financial and economic considerations are among the strongest motivators for cities to move towards sustainability. Many city representatives responded with examples that demonstrate the financial returns of moving towards sustainability. Both Dublin and Halifax were motivated to find cost savings through efficiencies (energy use, water treatment, waste management, transportation infrastructure) (Gleeson and Kofoed 2009; Deacoff and Townsend 2009), and to Dublin and Halifax were motivated to increase the economic competitiveness of the city (Gleeson and Kofoed 2009; Deacoff and Townsend 2009);

Several cities aimed to use sustainability as an engine for local economic development. Examples include:

- Pickering and Halifax were motivated to attract a diverse range of businesses to the city (McGinnis 2009; Deacoff and Townsend 2009);
- Växjö aimed to develop a partly-municipality-owned company to market sustainable infrastructure, technologies and solutions (Nilsson 2009); and
- Kingston and Morbegno were motivated by a desire to become self-reliance, to reduce external expenditures in meeting local needs (MacLatchy 2009; Mogavero 2009).

Halifax, Karlskrona, Kingston, Toronto, Växjö, and Whistler were driven to be eligible for funding from other levels of government (e.g. through the development of sustainability plans or other measures to be eligible for grants) (Deacoff and Townsend 2009; Wälitalo 2009; Melymuk et al. 2009; Bekkering 2009; Nilsson 2009; MacKay 2009). Kingston was driven to move beyond compliance and staying ahead of legislation, to avoid potential costs relating to late implementation (MacLatchy 2009).

3.1.4 Human

A majority of cities interviewed, including Calgary, Falkenberg, Halifax, Karlskrona, Kingston, Madison, Morbegno, Nillumbik, Pickering, Toronto, Växjö and Whistler are motivated towards sustainability to help build their community’s human capital, embodied in the skills, awareness and competencies of its citizens (Ascroft 2009; Andersson 2009; Deacoff and Townsend 2009; MacLatchy 2009; Statz 2009; Mogavero 2009; Johnson
Several practitioners noted that citizens who demand action on sustainability and support politicians working for sustainability can motivate municipal staff and sustainability champions (Clarkson 2009; Ezechiel 2009; Greenhow 2009; Linell and Thunberg 2009; Leung 2009). Canmore and Pickering noted their desire to attract and retain citizens, especially younger and highly-skilled residents (Caudill 2009; Melymuk et al. 2009).

Halifax, Kingston, Madison, Nillumbik and Pickering found themselves driven by sustainability champions in the community or municipal organization. These ‘fire souls’ are passionate about sustainable development and community change (James and Lahti 2004, 204), demonstrate leadership and have the ability to empower others (Deacoff and Townsend 2009; MacLatchy 2009; Statz 2009; Johnson 2009; Melymuk et al. 2009). Within internal municipal operations, Calgary, Canmore, Halifax, Karlskrona, Nillumbik and Toronto all noted that, once educated on sustainability, administrators, senior-level decision makers and politicians could act as sustainability champions (Ascroft 2009; Caudill 2009; Deacoff and Townsend 2009; Wälitalo 2009; Johnson 2009; Bekkering 2009).

3.1.5 Social

Building social capital is a strong motivator for moving towards sustainability (Clarkson 2009: Greenhow 2009; Klasson 2009; Kruger 2009; Lahti 2009; Leung 2009). Dublin, Kingston, Stockholm and Toronto had a desire to create networks that improve the quality of life for citizens (Gleeson and Kofoed 2009; MacLatchy 2009; Freudenthal 2009; Bekkering 2009). Dublin and Halifax mentioned a motivation to provide improved city services, while reducing the need for tax revenue, thereby lowering the cost of services to citizens (Gleeson and Kofoed 2009; Deacoff and Kofoed 2009).

Some examples of social drivers are:

- Calgary, Madison and Nillumbik are driven by citizens who develop community groups and networks to spread awareness of sustainability issues (Ascroft 2009; Statz 2009; Johnson 2009);
• Calgary, Canmore and Toronto have a need for more affordable and social housing (Ascroft 2009; Caudill 2009; Bekkering 2009); and
• Clarkson (2009), Ezechieli (2009), Greenhow (2009), and Harrington (2009) highlighted that the expectations of citizens of their government to provide social services that build social capital (e.g. health care and community services) was driving cities to move towards sustainability.

### 3.1.6 Cultural

Cultural capital is generally difficult to express separately from social capital, but is a product of shared experiences, and expressed through traditions, customs, values, heritage, identity and history (Roseland 2005, 11; Jacobs 2007). Kingston noted that its move towards sustainability was motivated by a desire to preserve its cultural heritage (MacLatchy 2009). Morbegno and Whistler witnessed this shift being driven by: a developing culture of sustainability; a common language and shared vision of success among citizens, business and the municipality; and a strong sustainability culture within the community and organizations (Mogavero 2009; MacKay 2009; Lahti 2009).

### 3.1.7 Political

Political capital does not necessarily reside within the politicians of a municipality. Rather, any group or individual who has the leverage to make changes to a system and engage others in their cause has political capital (Jacobs 2007). As highlighted by Ezechieli (2009), Harrington (2009), Klasson (2009) and Linell and Thunberg (2009), there are many political motivators for cities to move towards sustainability. In Calgary, Canmore, Falkenberg, Halifax, Karlskrona, Madison, Nillumbik, Pickering, Toronto and Växjö, politicians were motivated to embrace sustainability to improve their reputation, gain popular support and build trust with the electorate (Ascroft 2009; Caudill 2009; Andersson 2009; Deacoff and Townsend 2009; Wälitalo 2009; Statz 2009; Johnson 2009; Melymuk et al. 2009; Bekkering 2009; Nilsson 2009). Calgary, Canmore, Dublin, Halifax, Stockholm and Växjö were also motivated towards sustainability to make their city a leader and to stay ahead of regulations from national and international governing bodies (Ascroft 2009; Caudill 2009; Gleeson and Kofoed 2009; Deacoff and Townsend 2009; Ahlberg 2009; Nilsson 2009). Halifax, Pickering and Växjö were motivated by a desire to achieve good
governance and improve internal operations, leading to better cohesion and collaboration between departments, and an understanding of a whole system perspective as it relates to sustainability (Deacoff and Townsend 2009; Melymuk et al. 2009; Nilsson 2009). Some practitioners noted that politicians may also wish to facilitate long-term planning that also addresses current issues (Clarkson 2009; Klasson 2009; Leung 2009).


3.2 Barriers and Challenges Facing Cities on Their Move to Sustainability

There are barriers and challenges that cities and city administrators face either in integrating sustainability or in continuing sustainability initiatives. Sustainability practitioners highlighted the importance of being aware of the challenges cities face on their move towards sustainability (Willard 2009; Ezechieli 2009; Lahti 2009; Clarkson 2009; Linell and Thunberg 2009; Kruger 2009; Klasson 2009). The authors have also distinguished between barriers and challenges. Barriers are those obstructions to initiating sustainability measures, while challenges are those obstacles that cities encounter once already on their path towards sustainability. Despite the differences that exist between cities, many common barriers and challenges to moving towards sustainability were identified by both city officials and sustainability practitioners (Table B-1; Table B-2).
3.2.1 Natural

Willard (2009) noted that some the lack of distinct environmental or geographic constraints to growth and resource use can be a barrier to sustainability. The city of Calgary found it to be especially difficult to make a convincing case for natural preservation and urban boundaries because of the widely held perception that resources and available space are limitless (Pincott 2009).

One challenge facing the enhancement of natural capital in cities is the conflicting interests of municipalities and the development industry. Calgary, Pickering and Växjö mentioned that they are faced with developers who prefer to build single-family, single-zoned developments on greenfield (i.e. undeveloped) areas either within or just outside of city boundaries (Ascroft 2009; Melymuk et al. 2009; Nilsson 2009). A municipality that wishes to preserve open land must challenge powerful developers to prevent increasing urban sprawl and consumption of natural capital (McGinnis 2009; Willard 2009).

3.2.2 Physical/Built

Calgary, Dublin and Pickering claimed that unsustainable urban form is a major barrier to enhancing physical capital (Ascroft 2009; Pincott 2009; Gleeson and Kofoed 2009; Melymuk et al. 2009). It can be more difficult to retrofit existing infrastructure sustainably than to integrate sustainable development into new buildings and developments, as both Pickering and Madison are now attempting (Melymuk et al. 2009; Statz 2009). However, some suburban greyfield sites (e.g. sites with abundance of surface parking lots and aging buildings) are beginning to be converted to compact communities with greater potential for sustainability (Dunham-Jones and Williamson 2009, xii-xiii, 3-4, 234). In the cities of Pickering and Växjö, it was noted that regulations and building and zoning codes set by higher levels of government conflict with municipal sustainable development policies (Melymuk et al. 2009; Nilsson 2009; Greenhow 2009). The lack of stringent building regulations in some jurisdictions in these situations can make it difficult for a municipality to insist upon green building and design (Melymuk et al. 2009; Nilsson 2009).


3.2.3 Economic/Financial

Common barriers relating to economic and financial capital to integrating sustainability in Calgary, Canmore, Dublin, Falkenberg, Halifax, Karlskrona, and Nillumbik include existing financial uncertainties and the resulting desire to avoid risks and costs associated with experimentation (Ascroft 2009; Caudill 2009; Gleeson and Kofoed 2009; Andersson 2009; Deacoff and Townsend 2009; Wälitalo 2009; Johnson 2009). Some practitioners highlighted the perception that sustainability action is costly, and that initial expenses will not be recuperated through savings achieved through the implementation of sustainability measures (Clarkson 2009; Klasson 2009).

Economic and financial capital challenges can also affect ongoing sustainability initiatives. Canmore, Halifax, Karlskrona, Kingston and Nillumbik face challenges, including a lack of ability to make resources available for staff to maintain ongoing initiatives or develop new and innovative programs (Caudill 2009; Deacoff and Townsend 2009; Wälitalo 2009; MacLatchy 2009; Johnson 2009). In Nillumbik, citizen pressure on tax rates makes it difficult to enhance the municipality’s economic capital, due to appeals for enhanced city services at reduced costs (Johnson 2009).

3.2.4 Human

Citizens who are unwilling to change their lifestyle because of concerns that changes would result in a decline in both standard of living and quality of life were mentioned as a barrier to Calgary, Canmore, Halifax and Karlskrona on integrating sustainability (Pincott 2009; Ascroft 2009; Caudill 2009; Deacoff and Townsend 2009; Wälitalo 2009; Ezechiel 2009; McGinnis 2009). Cities that have not invested in citizen engagement to connect sustainability meaningfully to its residents’ lifestyles tend to be unable to fully access the potential that exists in those citizens (Harrington 2009; Leung 2009). These citizens could, once properly educated, engaged and empowered, create a demand for and direct their energy towards sustainability in the community. Barriers were also mentioned by Calgary, Halifax, Madison, Toronto and Växjö regarding municipal operations, as some staff and elected officials are entrenched in working styles that do not encourage collaboration and who lack knowledge of sustainability issues (Ascroft 2009; Deacoff and Townsend 2009; Statz 2009; Bekkering 2009;
Practitioners noted that a shortage of both time and resources to devote to sustainability training and initiatives, and a lack of incentives for staff presented barriers to sustainability (Ezechieli 2009; Harrington 2009; Lahti 2009; Kruger 2009). Representatives in Calgary, Falkenberg, Kingston and Växjö mentioned that citizens can be overwhelmed by global environmental problems and are either unaware of or feel powerless to contribute towards sustainability (Pincott 2009; Andersson 2009; MacLatchy 2009; Nilsson 2009; Kruger 2009). In contrast, Whistler, which has been working on sustainability since 2000, has witnessed some citizen fatigue around involvement and engagement in sustainability initiatives (MacKay 2009). Some practitioners noted that cities must continually engage their community members and invest in human capital to ensure that sustainability remains a focus (Harrington 2009; Leung 2009).

### 3.2.5 Social

Municipalities aim to meet citizen expectations around education, services, health care and safety. However, as mentioned by Greenhow (2009), Klasson (2009), Kruger (2009) and Lahti (2009), cities may feel pressured to direct resources to these societal priorities over sustainability measures, since they are current, high precedent issues.

Once municipalities have started on their path towards sustainability, they may face challenges from a lack of social capital. A challenge facing municipalities is the loss of connectedness between citizens, who may feel alienated and isolated, even in high population areas (Willard 2009). In the context of the global economic recession at the time of writing (2009), Calgary, Falkenberg, Kingston and Pickering have experienced citizens that are focused on meeting personal needs, and as such are less engaged in global sustainability issues (Ascroft 2009; Andersson 2009; MacLatchy 2009; Pickering 2009).

### 3.2.6 Cultural

Within Calgary, Dublin, Halifax, Madison, Toronto and Växjö, the barriers to enhancing cultural capital come from citizens and elected officials
entrenched in the status quo and resistant to changes in their manner of operation (Ascroft 2009; Pincott 2009; Gleeson and Kofoed 2009; Deacoff and Townsend 2009; Statz 2009; Bekkering 2009; Nilsson 2009). There are many cases where there is little alignment of the city’s culture with sustainability (Harrington 2009; Kruger 2009; Leung 2009). The language for communicating sustainability to citizens, staff and businesses may not be sufficiently developed to align sustainability with the goals and fundamental needs of citizens (Harrington 2009; Kruger 2009; Lahti 2009; Linell and Thunberg 2009; Leung 2009).

Cities that have overcome some initial cultural hurdles to begin moving towards sustainability may discover other challenges. The diverse populations within Dublin, Toronto and Sydney require multiple avenues to be explored to engage the entire population (Gleeson and Kofoed 2009; Bekkering 2009; Jose 2009). Using the right language to convey the importance of sustainability was mentioned as a challenge for Canmore, Halifax, Kingston and Whistler (Caudill 2009; Deacoff and Townsend 2009; MacLatchy 2009; MacKay 2009).

3.2.7 Political

Political barriers can be amongst the most challenging to surmount in cities that wish to move towards sustainability (Clarkson 2009; Ezechiel 2009; Greenhow 2009; Klasson 2009; Lahti 2009; Leung 2009; McGinnis 2009). Within municipal operations, there may be difficulty in locating an entry point for sustainable politics, due to the structure of municipalities (Clarkson 2009). Interviews with Dublin, Halifax, Pickering, Toronto and Whistler illuminated that some cities may struggle with a lack of senior-level buy-in (Gleeson and Kofoed 2009; Deacoff and Townsend 2009; Melymuk et al. 2009; Bekkering 2009; MacKay 2009). Practitioners noted that short political horizons result in short-term perspectives and planning (Greenhow 2009; Klasson 2009; Lahti 2009; Linell and Thunberg 2009; McGinnis 2009). Some municipalities become paralyzed by fear of failure, and enter a perpetual planning loop (McGinnis 2009). Representatives from Karlskrona, Kingston, Pickering, Toronto and Whistler mentioned that a lack of shared vision and goals between departments can result in poor communication and collaboration and conflicting initiatives and division between departments (Wälitalo 2009; MacLatchy 2009; Melymuk et al. 2009; Bekkering 2009; MacKay 2009; Clarkson 2009; Harrington 2009; Greenhow 2009; Linell and Thunberg 2009).
Conflicts between legislation implemented at higher levels of government and local sustainability initiatives can also challenge a city’s sustainable development strategy (Greenhow 2009). Some cities, including Canmore, Dublin, Nillumbik and Sydney, lack influence over aspects that have considerable impact on sustainability within their community (e.g. transportation and utilities) (Caudill 2009; Gleeson and Kofoed 2009; Johnson 2009; Jose 2009). In the above cities, conflicts in regional politics and lobbying against sustainability initiatives by business can hinder cohesive policy decisions that would improve sustainability performance (Caudill 2009; Gleeson and Kofoed 2009; Johnson 2009; Jose 2009).

A lack of engagement with the community can cause a disjointed relationship between the local municipality and its citizens (Clarkson 2009; Harrington 2009; Lahti 2009; Leung 2009). Systems in place may hinder broad-based participatory decision-making processes (Leung 2009). Engaged community members may become discouraged by the local political operations and a lack of concrete actions in regards to sustainability (Lahti 2009; Leung 2009). Finally, some community leaders may be susceptible to corrupting influences, and may be unwilling to move towards sustainability regardless of a compelling argument, as it does not serve their personal interest (Greenhow 2009).

### 3.3 Community Capital Returns on Investment

The community capital returns on investment that cities reported from move towards sustainability are outlined in the section below and in Table 3-1 and Table 3-2. Results are based on interviews with representatives from 17 municipalities. Survey results were captured for 15 of the 17 cities, and are presented in Appendix H. The benefits demonstrate the early successes that have been achieved in both the larger community (Table H-1) and within municipal operations (Table H-2). The number of cities that have experienced each benefit is included, and the form of community capital each benefit generates is expressed. Following the tables, all benefit areas are described, highlighting the survey responses. The number of positive responses does not indicate the likelihood of a benefit being achieved within a city, or the level of importance of achieving the benefit. The results are presented to demonstrate which returns on investment each city moving towards sustainability has achieved.
<table>
<thead>
<tr>
<th>Benefits to the community</th>
<th>Positive City Responses</th>
<th>Form of Community Capital</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Natural</td>
<td>Economic / Financial</td>
</tr>
<tr>
<td>Improved air quality</td>
<td>9</td>
<td>✓</td>
</tr>
<tr>
<td>Improved water resource access</td>
<td>11</td>
<td>✓</td>
</tr>
<tr>
<td>Reduced ecological footprint</td>
<td>10</td>
<td>✓</td>
</tr>
<tr>
<td>Reduced exposure to future risk</td>
<td>9</td>
<td>✓ ✓</td>
</tr>
<tr>
<td>Increased waste diversion</td>
<td>12</td>
<td>✓ ✓ ✓</td>
</tr>
<tr>
<td>Increased number of green buildings</td>
<td>13</td>
<td>✓</td>
</tr>
<tr>
<td>Increased public transit/ reduction in private vehicle use</td>
<td>9</td>
<td>✓ ✓ ✓ ✓</td>
</tr>
<tr>
<td>Savings through project sharing</td>
<td>9</td>
<td>✓ ✓ ✓ ✓</td>
</tr>
<tr>
<td>Citizen engagement</td>
<td>12</td>
<td>✓ ✓ ✓ ✓</td>
</tr>
<tr>
<td>Attracting and retaining citizens</td>
<td>6</td>
<td>✓ ✓ ✓ ✓</td>
</tr>
<tr>
<td>Sufficient or improved social housing</td>
<td>6</td>
<td>✓ ✓ ✓ ✓</td>
</tr>
<tr>
<td>Reduced crime rates</td>
<td>3</td>
<td>✓ ✓ ✓ ✓</td>
</tr>
</tbody>
</table>

Table 3-1. Categorization of the benefits to the community by form of capital
<table>
<thead>
<tr>
<th>Benefits to the community</th>
<th>Positive City Responses</th>
<th>Form of Community Capital</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Natural</td>
<td>Economic / Financial</td>
</tr>
<tr>
<td>Stronger culture of creativity and innovation</td>
<td>13</td>
<td></td>
</tr>
<tr>
<td>Increasingly diverse and resilient economy</td>
<td>7</td>
<td>✓</td>
</tr>
<tr>
<td>High employment levels</td>
<td>8</td>
<td></td>
</tr>
<tr>
<td>Improved citizen health and quality of life</td>
<td>8</td>
<td></td>
</tr>
<tr>
<td>Greater tourism market share</td>
<td>7</td>
<td>✓</td>
</tr>
<tr>
<td>New revenue opportunities and increased market share</td>
<td>11</td>
<td>✓</td>
</tr>
</tbody>
</table>

Table 3-2. Categorization of benefits to municipal operations by form of community capital

<table>
<thead>
<tr>
<th>Benefits relating to municipal operations</th>
<th>Positive City Responses</th>
<th>Form of Community Capital</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Natural</td>
<td>Economic / Financial</td>
</tr>
<tr>
<td>Cost savings in energy use</td>
<td>14</td>
<td>✓</td>
</tr>
<tr>
<td>Cost savings in water use</td>
<td>7</td>
<td>✓</td>
</tr>
<tr>
<td>Cost savings in solid waste management</td>
<td>9</td>
<td>✓</td>
</tr>
<tr>
<td>Cost savings in transportation fleet and fuel costs</td>
<td>12</td>
<td>✓</td>
</tr>
</tbody>
</table>
### 3.3.1 Benefits to the Community

**Air quality**

Nine cities responded that their sustainability initiatives had resulted in improved air quality. While other cities have initiatives in place to reduce emissions, some cities either found it difficult to make a direct correlation between their actions and improved air quality of the community, or had not noted improvements in their air quality. It was mentioned by several communities that advances in vehicle catalytic converter technology had contributed significantly to air quality improvements.

```markdown
<table>
<thead>
<tr>
<th>Benefits relating to municipal operations</th>
<th>Positive City Responses</th>
<th>Form of Community Capital</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Natural</td>
</tr>
<tr>
<td>Cost savings on the development, operations, and maintenance of infrastructure</td>
<td>6</td>
<td>✓</td>
</tr>
<tr>
<td>Improved employee loyalty and trust</td>
<td>9</td>
<td></td>
</tr>
<tr>
<td>Staying ahead of new imposed legislation</td>
<td>13</td>
<td>✓</td>
</tr>
<tr>
<td>Improved internal decision making</td>
<td>11</td>
<td></td>
</tr>
<tr>
<td>Improved collaboration between departments</td>
<td>14</td>
<td></td>
</tr>
<tr>
<td>Cohesive and innovative policy decisions</td>
<td>14</td>
<td>✓</td>
</tr>
<tr>
<td>Stronger long-term planning</td>
<td>13</td>
<td></td>
</tr>
</tbody>
</table>
```

34
**Water resource availability and quality**

Eleven respondents found an improvement to either water quality or water availability. The three cities that did not see an improvement in this area stated either that water resources were abundant and were not of major concern for the community, or that water saving initiatives predated sustainability initiatives.

**Reduced ecological footprint**

Ten respondents stated that sustainability measures had already resulted in reduced ecological footprint, by reducing a combination of GHG emissions, water waste and solid waste generated and by increasing the percentage of food demand met from local sources. The other five respondents were unsure of a direct correlation or did not monitor ecological footprint.

**Reduced exposure to future uncertainties and risk**

Nine respondents highlighted that their cities had reduced exposure to future uncertainties and risk. This question focused on several types of risk: reduced resource accessibility; natural disasters; the long-term effects of climate change; increasing insurance costs; and regional, national or global economic disruptions.

This reduction in exposure and risk can be associated with long-term municipal planning, and can build political capital, if the efforts of the local authorities to protect the community from external factors and make their city more robust are recognized. Four of the respondents did not find a correlation between their sustainability initiatives and reduced exposure to risk because of difficulties in measuring this indicator.

**Increased waste diversion rates through recycling and composting**

Twelve of the cities surveyed stated that there had been an increase in waste diversion rates, reducing pressures on current landfills and avoiding the necessity of building new waste disposal sites. The other three cities either did not monitor or were too early in their initiatives to be certain of a measured increase in waste diversion.
Increased number of green buildings

Thirteen of the cities responded that they have seen an increase in the number of green buildings, in both municipal and private developments. The category of green development included buildings certified under the Leadership in Energy and Environmental Design (LEED®) designation, as well as buildings with green roofs, excellent energy efficiency and improved district heating and cooling systems. The high level of positive response demonstrates that sustainability measures are linked closely with improved physical capital and an increasingly sustainable urban form.

Increased public transit use and reduced private vehicle use

Nine of the cities responded that they have found an increase in public transit use and/or a reduction in the use of private vehicles. The answer is largely dependent on the city; a smaller city is more likely to witness reductions in private vehicles due to minimal demand or need for public transit. In some communities, public transit investments have permitted cities to avoid road construction to support growing populations and greater traffic flow (Pincott 2009; Ahlberg 2009). Five other respondents noted that while public transit ridership may have increased, a reduction in private vehicle use has not been found, and so responded no to this question.

Savings through project sharing

Nine of the respondents claim to have found cost savings through realizing project overlaps and collaborating on joint initiatives. By collaborating with external entities, cities and their affiliated groups can save in multiple resource areas (staff, finances, time) while building social and human capital. Project collaboration brings business, citizens, non-governmental organizations and municipal forces together, building cohesion and developing networks in the community. Six of the responding cities were unsure about the direct correlation between savings through project sharing and sustainability initiatives, or have not monitored it.

Increased citizen engagement through greater number of community sustainability initiatives

Twelve of the responding cities experienced an increase in citizen engagement as a result of community sustainability initiatives, facilitating an awareness and education around sustainability issues. Outreach
activities provide an opportunity for community members to interact and network, generating social and cultural capital that can strengthen communities by building trust, cohesion, tolerance and a shared understanding of the importance of making their community sustainable (Leung 2009). Two cities had not noted an increase in engagement, but also mentioned that they have not implemented many community programs.

**Attracting and retaining citizens**

Six of responding cities claimed to have found the benefit of attracting and retaining citizens as a result of sustainability initiatives. Economic diversification, strong social services and cultural activities are an investment in human, social and cultural capitals that make cities vibrant, living systems that offer diverse employment opportunities and high quality of life (Clarkson 2009; Harrington 2009; Leung 2009; Willard 2009). Cities that engage in these efforts are rewarded with citizen loyalty, trust and satisfaction, and are able to draw and keep citizens (Leung 2009; Willard 2009). Nine of the respondents were unsure of the correlation between sustainability initiatives and attracting and retaining citizens, or had not monitored whether this had occurred.

**Improved or sufficient affordable housing developments**

Six respondents claimed that an increase in social or affordable housing opportunities had resulted from of their sustainability initiatives. However, five of the respondents found no increase in this measure, and an additional six were unsure if there was a correlation between social housing and sustainability initiatives in the municipality.

**Reduced crime rates**

Only three of the respondents had noted lower crime rates, and these respondents were unsure whether these reductions could be linked to sustainability initiatives. One respondent mentioned that it could be linked to sustainability only if increased funding for policing was to be considered a sustainability measure (MacLatchy 2009). Ten cities either saw no decrease in crime rates or would not attribute it to sustainability initiatives in the city.
Strengthened culture of creativity and innovation

Thirteen of the responding cities were experiencing a strengthened culture of creativity and innovation either within or external to municipal operations. This measure closely links to attracting citizens and innovative business. Within operations, cities have found that increasingly engaged employees are developing inventive solutions to problems and that staff are now generating new sustainability initiatives. Four of the respondents were unsure of a direct relationship between sustainability initiatives and this indicator or did not monitor creativity and innovation.

Increasingly diverse and resilient economy

Seven of the respondents stated that their city was attracting innovative businesses and diversifying their business sector to create greater resiliency in their local economy. Greater diversity increases the robustness of a city’s economy, while concurrently making it more resilient to external economic and environmental events (Haughton 1997). Five respondents did not find a direct correlation between sustainability initiatives and a more diverse and resilient economy.

High employment levels

Eight of the cities responded that they had seen an increase in employment levels throughout the community. This measure is closely linked with attracting innovative business, building a strong local economy, improving quality of life, retaining a skilled work force and increasing the a vibrancy of the community (Haughton 1997). Eight of the respondents were unsure of the direct correlation or did not monitor this measure within their city.

Improved citizen health and quality of life

Eight respondents stated that their cities had experienced an improvement in citizen health and quality of life. While all cities noted that enhancing in social capital in this area should be a result of sustainability initiatives in the city, eight were unsure of their ability to accurately report on this measure.

Greater tourism market share

Seven of the responding cities experienced an increase in tourism as a result of sustainability initiatives. Regardless of whether visitors are drawn to
cities as a result of an improved reputation, preservation of natural and cultural heritage or to learn of innovative sustainability initiatives, increased tourism brings revenue into the local economy and supports the hospitality industry (Willard 2009). Six respondents were unsure of the correlation or did not monitor tourism levels.

**New revenue opportunities and increased market share**

Eleven of the responding cities have noted new revenue opportunities from their sustainability measures, either through easier access to finance from higher levels of government or through increasing external investments in their cities. An example of this is the funding from the Canadian federal government from gasoline tax revenues that is directed to cities that develop an integrated community sustainability plan (ICSP). Two of the cities did not see increase revenue opportunities, while another two were unsure of the correlation between receiving funding and their sustainability initiatives.

**Increased local, regional or international reputation**

While this measure was not initially included in the survey, a majority of responding cities mentioned this factor during the interview. City staff members are looking for successes that other cities have achieved from sustainability measures to encourage their own city to follow suit, and there are many networks currently sharing best practices. An improved reputation can build the pride of citizens and has many social, human and cultural returns on investments as well.

### 3.3.2 Municipal Operations Benefits as a Result of Sustainability Initiatives

**Reduced energy costs in municipal buildings**

Fourteen of the responding cities have experienced cost savings from reduced energy use in municipal buildings as an early result of their sustainability measures. Energy savings have been achieved by incorporating efficiency in the retrofit of old buildings and incorporating sustainable design into new buildings (Nilsson 2009; Andersson 2009). Demonstrating evidence of quick returns on investments can encourage
future sustainability initiatives in the municipality as well as in the community.

**Reduced water costs in municipal buildings**

Seven cities have noted a reduction of water use in municipal buildings as a result of their sustainability measures. Five of the responding cities have not found a reduction in water use; some claimed that reducing water use has not been a focus of the municipality.

**Cost savings in solid waste management**

Nine cities surveyed have experienced cost savings as a result of increased waste diversion, by saving on landfill tipping fees and avoiding the need to purchase new landfill space. Some communities mentioned that, while waste disposal costs have increased they have done so because of higher tipping fees, and by diverting more waste from landfill, they have mitigated cost increases. Four of the responding cities have not seen cost savings for solid waste management, and a number of these communities felt it was too early in their initiatives to truly establish this correlation.

**Reduced vehicle and fuel costs for municipal fleets**

Twelve of the responding cities have seen savings in fuel costs as a result of switching to more efficient vehicles (e.g. best in class) for their fleet, right-sizing vehicles, shifting to active transport for municipal services (e.g. walking and bicycling) where possible, and monitoring service and delivery routes (e.g. Bekkering 2009). A linked benefit is the reduction of fuel consumption and GHG emissions. Three respondents had not reduced their municipal transportation costs, likely because initiatives had not been implemented as yet.

**Cost savings on development, operations and maintenance of infrastructure**

Six responding cities had experienced cost savings for road, water and energy infrastructure. This is an indication that moving towards sustainable urban form requires less infrastructure to support growing populations. This is a positive return on investment in physical capital as a result of sustainability initiatives. Another seven respondents were unsure of the
direct correlation between sustainability and reduced costs, or have not monitored this area of their operations.

**Increased employee loyalty and trust**

Nine responding cities have experienced an increase in employee loyalty and trust as a result of their sustainability programs. Investments in staff that result from the integration of sustainability throughout the municipal culture, including through education and empowerment (giving employees a voice and making their work meaningful), can be returned through increased staff productivity, staff retention, and ease of recruitment of new, highly skilled staff. In contrast, four respondents did not find an increase in employee loyalty and interest as a result of integrating sustainability in operations.

**Staying ahead of new externally imposed environmental laws or taxes**

Thirteen of the respondent cities found that integrating sustainability into their operations allowed them to stay ahead of externally imposed environmental laws or taxes, saving them money over the long term.

**Improved internal decision-making**

Eleven of the respondents have noted an improvement in internal decision-making processes as a result of sustainability measures. Key city staff have been educated so that they consider sustainability in their decisions and empower other employees to integrate sustainability to day-to-day work.

**Improved collaboration between departments**

Fourteen respondents stated that they have seen improved collaboration within their organization as a result of integration of sustainability into operations. This investment builds interpersonal interactions and networks between departments for reduced departmentalization, and drives a change in corporate culture towards collaboration and cross-departmental work. This return also results in cohesive and innovative policy decision and improved internal decision making.

**Cohesive and innovative policy decisions**

Fourteen respondents experienced an increase in cohesive and innovative policy decisions in regards to capital investment, guidelines, environmental
management systems, and green procurement strategies. This political return on investment requires local municipal leaders to extend their authority in order to influence change that affects both operations and the wider community.

**Long-term planning that also addresses current issues**

Thirteen of the responding cities have noted that their sustainability program has increased their ability to plan for the long-term while also addressing current issues. The short political cycles of most local municipalities makes long-term planning difficult, so improving a city’s long-term planning requires that senior level officials be supported by citizens and staff and are able to use their positions to make significant change.

**3.4 Framework for Strategic Sustainable Development in cities**

A comparison of results was conducted between cities using the FSSD and those using other models or frameworks to move towards sustainability. The survey responses were tabulated according to city category (Appendix H) in order to determine key differences between returns on investment experienced as a result of sustainability initiatives (Table H-1; Table H-2).

Overall, cities using the FSSD and other models for moving towards sustainability experienced similarly high returns on investment within their internal operations. Within the wider community, there are notable differences between the two categories of cities. Those cities using other models for sustainable development responded positively more frequently to benefits that improve natural capital. The benefits include; improved water resource access; reduced ecological footprint; reduced exposure to future uncertainties and risk; cost and resource (energy and water) savings in municipal buildings; and improved solid waste management. These cities responded positively less frequently for benefits in the other community capital areas (Table 3-3).

Within the wider community, cities using the FSSD to move towards sustainability experienced a balance response to all seven forms of community capital. Cities using the FSSD responded positively more frequently to benefits to social and human capitals resulting from their
measures. These include: improved citizen health and quality of life; greater tourism market share; cost savings through project sharing; increased citizen loyalty, trust and satisfaction; attracting and retaining citizens; and sufficient affordable housing opportunities.

Table 3-3. Key differences in benefits experienced for cities using the FSSD compared to other models of frameworks for moving towards sustainability

<table>
<thead>
<tr>
<th>Model/Framework for Moving Towards Sustainability</th>
<th>FSSD</th>
<th>Other</th>
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</thead>
<tbody>
<tr>
<td>Cities</td>
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<tr>
<td>Whistler</td>
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<td>Växjö</td>
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<td>Falkenberg</td>
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<td>Calgary</td>
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<td>Karlskrona</td>
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<td>Morbegno</td>
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| Differences in Benefits Experienced               |      |              |
| • Improved citizen health and quality of life     |      | • Improved water resource access |
| • Greater tourism market share                    |      | • Reduced ecological footprint |
| • Cost savings through project sharing            |      | • Increased waste diversion rates |
| • Attracting and retaining citizens               |      | • Reduced exposure to future uncertainties and risk |
| • Sufficient affordable housing opportunities      |      | • Resource (energy and water) savings in municipal buildings |

3.5 Sustainable Cities – Realizing the Seven Forms of Community Capital – A Resource Guide

One of the major goals of this thesis was to develop a resource guide as a tool for practitioners to engage senior level officials in sustainability. This guide aims to assist practitioners in effectively engaging senior municipal staff. To accomplish this, the language that practitioners currently use around sustainability with cities should be understood, as should the evidence that would create a compelling case to convince senior level officials of the benefits of moving towards sustainability. The authors asked sustainability practitioners about the language they use when speaking with cities about sustainability. A number of the practitioners stated that using language that fits with the city’s current situation was crucial to engaging cities (Willard 2009; Ezechieli 2009; Lahti 2009; Clarkson 2009; Linell and Thunberg 2009; Kruger 2009; Klasson 2009).
This may involve approaching them from an issue that is important to them, finding a way of making sustainability meaningful to staff, and finding correlations and means of integrating sustainability into their existing work (Harrington 2009; Kruger 2009; Klasson 2009). Certain situations may require language that focuses on economic development (Willard 2009; Ezechieli 2009; McGinnis 2009; Greenhow 2009; Harrington 2009; Linell and Thunberg 2009; Klasson 2009), stating that sustainability can improve competitiveness, while other cities may be more receptive to talk of protecting natural assets (Clarkson 2009), increasing community strength (Clarkson 2009) or generating a democratized planning process (Clarkson 2009; Ezechieli 2009; Lahti 2009; Greenhow 2009; Linell and Thunberg 2009). These responses indicate the importance of knowing a city’s situation and its senior officials’ stances on sustainability. Acknowledging this, the resource guide:

- Provides language relevant to a city’s context;
- Encourages the practitioner to ask questions to become familiar with the cities current sustainability situation, enabling the practitioner to provide the most compelling evidence; and
- Is a flexible tool that allows the practitioner to choose evidence that best supports the current challenges a city is facing in its progress towards sustainability.

City staff and officials were asked how, based on their success, they would convince a hesitant city on the importance of moving towards sustainability. The interviewees responded that they would share examples of ‘on the ground successes’, showing the implementation, fulfillment and results of sustainability initiatives (MacKay 2009; Nilsson 2009; Melymuk et al. 2009; Wälitalo 2009; Statz 2009; Ascroft 2009; Gleeson and Kofoed 2009; Freudenthal 2009; Ahlberg 2009). The necessity of a move towards sustainability was also mentioned (Wälitalo 2009; Statz 2009; Pincott 2009; Caudill 2009; Gleeson and Kofoed 2009; Bekkering 2009); one interviewee stated that there was really no choice but to become more sustainable (Jose 2009).

Demonstrating cost savings and financial returns on investment in the long run were specifically important in engaging senior level staff (MacKay 2009; Wälitalo 2009; Ascroft 2009; Caudill 2009; MacLatchy 2009). However, in addition to economic evidence, a majority of respondents followed up by stating that doing what is best for residents matters tremendously for those running cities (Wälitalo 2009; Statz 2009; Ascroft
2009; Caudill 2009; Gleeson and Kofoed 2009). By implementing and following through on sustainability initiatives, cities can improve social cohesion and create a space that can provide a better standard of living for citizens (Statz 2009; Ascroft 2009; Mogavero 2009). City staff also mentioned that improved reputation and more engaged citizens were a result of sustainability initiatives within the municipality (Statz 2009; Ascroft 2009; MacLatchy 2009; Freudenthal 2009; Ahlberg 2009; Johnson 2009). These responses support the prediction that an evidence base is essential for engaging with senior level officials in sustainability, whether the evidence is financial or in another form of community capital. City officials want to hear about the results that other cities are experiencing, and this was taken into consideration when developing the resource guide.

3.5.1 Resource Guide Format

The resource guide contains the following format to share information with practitioners:

*Who Should Use this Guide?* – A description of the guide’s target audience.

*How to Use this Guide* – Details on using the information provided to engage with senior level officials.

*Scope* – The definition of the city, and the resource guide’s scope.

*Table of Contents*

*The Global Sustainability Challenge* – An introduction to the metaphor of the funnel and the principles for sustainability.

*The Role that Cities Play in Global Sustainability* – A description of the leverage available in cities to help society move towards sustainability.

*The Vision of a Sustainable City* – A definition of success for cities moving towards sustainability, and how this guide can help along the way.

*Backcasting as a Strategic Planning Tool* – the concept of backcasting from a vision of success, and an explanation of the benefits experienced from having a shared vision in cities.

*An Introduction to Community Capital* – An introduction to the seven forms of community capital and how these can be enhanced in cities.
**Know Your City** – A list of questions is provided to cities to guide their understanding of their current situation and where they stand in regards to sustainability

**Potential Drivers and Barriers** – Using the forms of community capital, analyse the common motivators and challenges that cities face in implementing sustainability measures, based on global research.

**See What Other Cities Have Done** – Based on the identified drivers and challenges of the city, this list of demonstrated successes can be used to provide an evidence base in support of sustainability initiatives. The benefits have been divided by the relative size of the city and the seven forms of community capital.

**Build Your Case** – Using a hypothetical city as an example, the user can learn how to build a case for sustainability for their city from the examples in the “See What Other Cities Have Done” chapter.

### 3.5.2 Expert Panel Feedback

Upon completion of the first draft of the resource guide, a feedback request was sent to a panel of experts consisting of sustainability practitioners working with cities (Table B-3). These practitioners have varying levels of knowledge of overall sustainability concepts and familiarity with the FSSD. Feedback was requested on the applicability and usability of the content provided. The intention of corresponding with the Expert Panel was to employ their experiences in regards to the language and techniques for engaging cities in the process of moving towards sustainability. The Expert Panel feedback helped the authors tailor and strengthen the resource guide. This section summarizes the feedback gathered from the Expert Panel.

1. **Does the introduction provide valuable context to prepare the reader for using the resource guide? (Useful, somewhat useful, neutral, not useful)**

A majority of expert panel members found the introduction to be useful to prepare the reader for using the guidebook. Comments for strengthening the introduction included: editing the content to tighten the focus; formatting to utilize white space and increase readability; and to include a ‘hook’ up front to capture the readers’ attention. One respondent misinterpreted the ‘motivators’ as the benefits cities have experienced. The distinction between the ‘Potential Drivers and Barriers’ and the
'Introduction to Community Capital’ sections should help to clarify the content in both sections for readers.

2. Is the language used in this resource guide applicable to engaging with cities? Do you have any suggestions to strengthen the language?

Overall, the expert panel felt that the language used in the guide was appropriate for engaging with cities, and utilized municipality-relevant terms. More specifically, one respondent felt that it was valid that the political component of community capital was included in the guide’s scope. There was one comment that the language used may be too advanced for non-native English speakers.

3. From the ‘challenges cities face moving towards sustainability’, do you feel that those presented encompass the barriers that, in your experience, cities encounter? If not, what additional barriers would you add to our list?

The expert panel stated that, in general, the authors had covered the challenges that cities face in moving towards sustainability. There were, however, a number of additional barriers suggested for incorporation into the resource guide. These include:

- Additional emphasis on apathy and lack of engagement by citizens, especially in current times where economic challenges have grown;
- Under the social capital heading, a description of the alienation and isolation that people feel from others, even in crowded communities, and the expectations around education services, health care, and safety;
- Increasing the focus on crime and youth leaving the community, as these issues are common for communities in decline;
- The lack of institutional capacity in many cities to undertake initiatives to move towards sustainability, and the many demands that cities experience in regards to needs of citizens; and
- The challenge of meeting basic needs of poor people in developing country cities, e.g. housing, water and sanitation services, and how sustainability initiatives are low on developing country cities’ lists of priorities. These needs also influence politicians to allocate budgets to address basic needs.
4. From the table of suggested questions, aimed at understanding a city’s position on sustainability, do you feel that these encompass enough depth to provide a starting point in engaging a city to move towards sustainability? What additional questions from your experience would you add?

Expert panel members mentioned that the questions provided were a good starting point for a discussion regarding sustainability action and integration within a city. One respondent requested clarification on where the questions are coming from and who is responding to them and what the practitioner should do with the answers. A tip from another respondent was to include a short description for each question or group of questions, to explain what the interviewer should be looking for from the answer and why it is important to ask. Another recommendation was to attempt to align the questions with the forms of community capital, as done throughout the document.

Expert panel members also recommended some additional questions:

- Do citizens and important stakeholders have a common picture of what they would like their municipality to be like in 20 to 50 years, as an attractive location for their children and grandchildren to enjoy a high quality of life?
- How do the characteristics of an attractive city map to the seven capitals of sustainability?
- What are the three most important and relevant kinds of capital for you to focus on first as a municipality? Why?
- What is the degree to which the city has evaluated its ‘social fabric’ and the extent to which they have developed a plan to address this challenge?

5. We provided a list of benefits, presented under the seven forms of community capital, that cities identified as a result of moving towards sustainability. Do you feel that this method enables you to pick and choose the benefits that best apply to the situation of the city you are working with? Are there benefits that you would like to highlight, or have evidence to support?

The respondents felt that the list of benefits provided stimulating examples and a strength of the guide. There were comments suggesting ways to strengthen the section and increase its applicability. The previous format
appeared random; grouping the examples in community archetypes, e.g. size and/or pressures could overcome this challenge and help communities find examples that are most relevant to them. It was suggested that the examples be expressed as benefits, rather than (or in addition to) presenting them as forms of community capital, as there are overlaps between forms of capital within each example. It is also critical to mention that sustainability planning should consider all community capital aspects. It was suggested that the resource guide present some measures that can help practitioners engage senior level officials on sustainability on issues important to them.

6. We have heard from city officials that evidence which demonstrates returns on investment are critical to achieving senior level buy-in to sustainability initiatives. Do you feel that the benefits presented in this guide would facilitate engaging with senior level officials in the community or city you are working with? If not, how would present these results?

Respondents mentioned that the return on investment examples are a strong part of the guide, but that to make the examples more compelling, greater detail and more numbers should be provided (e.g. financial savings, amount of funding, reduction in resource use, etc). One respondent suggested that practitioners could utilize the methodology the city normally uses when assessing return on investment for projects and then plugging in the data from relevant examples to determine if the city were able to reap similar returns.

7. We presented an example of a hypothetical city on how to use our resource guide. Was this helpful in demonstrating the flexibility and applicability of the results to a variety of audiences and circumstances? If not, do you have any suggested methods to ensure our guide applies in a range of situations?

The expert panel found that the example provided was useful for demonstrating the applicability of the information provided in the guide. The section could benefit from editing to guide the reader from going between the guide and practical measures.

8. In addition to the table of benefits, in the future we intend to include case studies for 3 to 4 cities that are moving towards sustainability. Do you feel that these cases will be useful to provide
further support to encourage cities to move towards sustainability? (useful, somewhat useful, neutral, not useful)

Responses to the case studies were somewhat mixed. Some reviewers mentioned that strengthening the example and including links to more information for each would improve the document, without needing more specific case studies. Others felt that case studies would improve the level of detail, increasing the utility of the guide.

9. What are the strengths and weaknesses of our resource guide? Is there anything that you would add or remove to make it more suitable for practitioners wishing to engage senior level officials in the move towards sustainability? Why?

The expert panel mentioned that the resource guide is useful because it is short, clear and relevant, as were the wide range of cities and examples. The range illustrated the guide’s points on tools and approaches to sustainability. The expert panel encouraged further editing and a tighter focus, and an improved focus on developing human capital in staff and citizens, to provide the energy for developing the other forms of capitals. In addition, the benefits of moving towards sustainability should be more explicit within the guide.

10. Do you have any other comments, suggestions or recommendations?

It was recommended that the authors include a list of the cities highlighted in the guide, and details on each city.
4 Discussion

4.1 Application and Implications of Key Findings

This section presents the key findings of this research and discusses the implications of the findings on cities beginning or already on their move towards sustainability. The findings will be presented in a resource guide for practitioners to engage with senior-level officials, and will be approached as a strategic tool for guiding cities towards sustainability.

4.1.1 Motivators and Drivers

A city may be motivated or driven towards sustainability because of forces internal or external to municipal operations. Prior to initiating research, the authors were concerned that cities were primarily moving reactively towards sustainability out of a crisis or need. These external drivers could include detrimental events, such as resource availability crisis, environmental disasters, social discord or economic collapse (particularly in communities without diverse economies) (James and Lahti 2004, 225). While cities in a crisis mode may be open to major shifts (James and Lahti 2004, 225), there may be less incentive for cities that do not face major challenges to move towards sustainability, and a compelling case for sustainability may be more difficult to build.

The results contradicted the authors’ concerns, showing that, among the cities interviewed, a majority have moved towards sustainability as a proactive measure. These cities acted before an urgent need presented itself, motivated by a desire to enhance the quality of life in the community for citizens. In addition, of those cities interviewed that were driven out a crisis or need, many undertook further sustainability measures upon recognizing the link between sustainability initiatives and enhanced community assets (e.g. Ascroft 2009).

Despite the differences between cities, several common motivators were identified among all cities interviewed. These included desires to: preserve local environmental and cultural heritage; attract and retain citizens; provide enhanced social services; and foster citizen engagement and pride. The common motivators demonstrate that some senior-level decision makers in municipalities perceive sustainability initiatives as advantageous
measures to enhance various community assets. While specific motivators and drivers may be unique to a city’s situation, cities are largely moving towards sustainability to achieve the same result – a more resilient city that offers a high quality of life for its citizens. A city’s resilience can be enhanced by strengthening its community capital (Roseland 2005, 4-14). Therefore, the authors were encouraged to present examples of community capital returns on investment within the resource guide as a method for engaging municipal staff in the move towards sustainability.

During the analysis of the results, motivators and drivers were categorized according to the form of community capital that was acting as the force behind a city’s desire or need to move towards sustainability. The results emphasized that elements of human and political capital are the largest driving forces for sustainability in cities. Human and political drivers highlighted during interviews with city staff include: citizen awareness and competencies on sustainability issues; ‘fire souls’ in the community or municipal administration; and charismatic politicians and community leaders who embrace sustainability issues. Practitioners also noted that human capital, including an empowered group of citizens who demand action and vote for politicians that will deliver on sustainability, can motivate municipalities to move towards sustainability (Ezechieli 2009; Lahti 2009; Leung 2009; McGinnis 2009). A city’s success in transitioning towards sustainability relies on broad citizen engagement and participation (WCED 1987, 242), a finding supported by this research, as people and their knowledge and competencies are critical to building and maintaining a city’s momentum on sustainability.

4.1.2 Barriers and Challenges

Cities moving towards sustainability will encounter barriers and challenges along the way. These can include barriers to integrating sustainability and initiating action, and challenges to continuing initiatives within the community. Sustainability practitioners highlighted that cities face different combinations of barriers and challenges in progressing towards sustainability. City representatives highlighted some unique challenges, but there were also considerable commonalities between the responding cities.

The largest group of barriers to sustainability measures relate to human and political capital. From interviews with city staff, common examples of human and political barriers include: citizens unaware of sustainability
issues and unwilling to change their lifestyles; municipal staff entrenched in current working styles; lack of senior-level staff buy-in to sustainability initiatives; and disjointed relationship between the municipality and citizens. It is not surprising that human and political capital are the largest drivers towards and biggest barriers against sustainability measures in cities. Practitioners stated that cities that have not invested in citizen engagement often fail to connect sustainability to its residents’ lifestyles meaningfully, and are thus unable to fully access those citizens’ potential (Clarkson 2009; Harrington 2009; Lahti 2009; Leung 2009).

Cities that have overcome the initial barriers to integrating sustainability and initiating measures can provide important lessons for cities that are at the outset of the journey (MacKay 2009; Statz 2009). These cities can, however, face challenges relating to the length of their experience with sustainability. With their engaged citizenry, they may note citizen fatigue or unrealistic demands. These cities face the ongoing challenge of engaging both staff and citizens in order to maintain sustainability momentum. This result further demonstrates the need for ongoing investment in the human and political asset areas to drive and inspire cities towards sustainability.

In Section 3.2, barriers and challenges were categorized according the form of community capital that was preventing sustainability integration or hindering ongoing measures. The representation of barriers and challenges in each form of community capital emphasizes the need to simultaneously enhance all forms of community capital. A barrier or challenge in one community capital area can signify a lack of investment in one or more asset area. Therefore, integrating sustainability into municipal operations should be done to give the city the benefit of a whole systems perspective, demonstrating that the challenges cities face are connected and can be simultaneously addressed (Willard 2009).

### 4.1.3 Community Capital Returns on Investment

Cities often adopt a set of indicators to monitor their progress on sustainability initiatives. To ensure that the scope of this research conveyed a wide range of potential measures, across municipal operations and the community, three existing indicators sets (Clarkson et al. 2008; Shin et al. 2009; SustainLane 2008) were considered in developing the list of benefits sought in the survey questions. The interview replies and survey results revealed a high number of positive responses for benefits seen within
municipal operations. It was expected that the municipal operation returns on investment would aligned with The Seven Business Case Benefits as identified by Bob Willard (Willard 2005, 130). These results demonstrate that internally, cities have the potential to achieve a number of benefits from integrating sustainability into their operations. Most notably, based on survey responses, are the municipal benefits of:

- Cost savings: energy use in municipal buildings, solid waste management and fleet and fuel costs;
- City employee loyalty and trust, productivity and staff retention;
- Staying ahead of externally imposed environmental laws or taxes;
- Improved internal decision making process and greater collaboration between departments;
- Cohesive and innovative policy decisions; and
- Long term planning that also addresses current issues.

Among the benefits experienced by municipal operations, there was an unexpectedly low positive response rates for ‘cost savings on the development, operation and maintenance of infrastructure such as transport, water and energy systems.’ Less than half of the cities noted this benefit as a result of sustainability initiatives. A possible explanation for the negative responses may be found in the interviews conducted with city staff, who mentioned that city-managed infrastructure is one of the biggest municipal capital and operating expenses. Interviewees noted that infrastructure was typically a fixed budget item, and that costs in this area would not decline as a result of sustainability initiatives, due the face that physical capital and related services are a reality of managing and operating a city. However, it is important to note that sustainability integration in a city may not reduce infrastructure costs, but it can change how a city develops and operates its infrastructure. For example, in the city of Calgary, resources were shifted away from road construction, to focus on the installation and upgrades of public transit (Pincott 2009). Therefore, a more appropriate measure for physical and economic return on investment would have been, an ‘increase in resource allocation for more sustainable infrastructure development and operation’ as a result of sustainability integration.

In regards to the benefits experienced in the broader community, the results portray a wide and differing range of community capital returns on investment. The authors found that the different positive responses collected for each city was a result of a number of factors, including: the
framework or model utilized for moving towards sustainability; length of time working towards and experience with sustainability; and the barriers and challenges each city faces to integration and development of sustainability initiatives.

The survey results demonstrate that the community asset areas of human, social and cultural capital had fewer positive results compared to the other forms of capital. Interviews with city officials highlight the difficulty that exists in confidently establishing a baseline for measurement and reporting on these forms of capital (Ascroft 2009; Caudill 2009; Mogavero 2009; Nilsson 2009; Wälitalo 2009). Therefore, this finding does not necessarily indicated that the cities are not experiencing returns on investments in the human, social and cultural areas, but that it is a challenge to measure and monitor these assets. In addition, not all cities have made the link between sustainability initiatives and enhancements in the human, social and cultural forms of community capital. Many cities early into their monitoring and reporting were either not confident that there had been an improvement in the specific benefit area, or that the benefit had a causal link to sustainability measures. For example, reduced crime rates received very few positive responses. City representatives stated that deterring crime is not often viewed as a sustainability measure (Johnson 2009; Statz 2009). However, reducing crime rates requires simultaneous enhancement of multiple forms of community capital. Cities with reduced crime also demonstrate greater citizen trust, stronger social fabric, safer communities, pedestrian friendly streets, and urban form that create safe public spaces (Séguin and Germain 2000, 40).

4.1.4 The FSSD vs. Other Sustainability Frameworks

Given the complexities involved in city planning, the FSSD offers a strategic and whole systems approach to decision-making (Broman et al. 2000). An element of this project was to analyse cities that have adopted the FSSD and the sustainability principles, to determine the returns and benefits that these cities have experienced. Comparing cities that have used the FSSD to those using another framework or model for moving towards sustainability can highlight some key differences.

A majority of the cities interviewed that were not using the FSSD were instead using models and strategies based primarily on environmental considerations to move towards sustainability. These models include
ecological budgets (e.g. Växjö), environmental management systems (e.g. Calgary, Pickering) and triple bottom line programs (looking at economic, social and environmental returns) (e.g. Toronto, Sydney). Cities using these models were more likely to have responded positively to having reduced their impacts on natural capital. Considering the focus of these models is on the preservation and protection of the natural environment, initiatives in these cities have so far focused on energy and resource efficiency, reducing GHG emissions, improving transportation networks, and environmental risk management. It can be expected that these cities would respond positively to improvements in natural capital because of this focus. However, these cities did not respond as positively to improvements in the other areas of community capital, in particular the social, human and cultural forms. This is not necessarily an indication that these cities have not achieved these benefits; however, it does demonstrate that models lacking a connection between environmental sustainability and the social, human and cultural aspects may lead to these areas not being measured or monitored.

Cities using the FSSD to move towards sustainability responded positively more often on social and human capital returns, including improved citizen quality of life and well-being, increased tourism, and savings through realizing project overlaps and opportunities for project sharing. The difference is likely a result of these cities backcasting from sustainability principles. From the perspective of a city system, backcasting can be applied from the vision of a sustainable city that does not contribute to the violation of the sustainability principles. Those cities using the FSSD as a model are more likely to create a shared vision of sustainability that considers a whole systems perspective that addresses a city’s current reality. Evidence that cities are backcasting from all four SPs (thus including both ecological and social aspects in the cities) is seen in the higher reported return on human, social and cultural capitals.

One potential threat facing cities today is vulnerability, as a result of relying on external resources to meet local needs (Bridger and Luloff 2001, 462; Greenhow 2009; Haughton 1997). Taking a balanced approach to enhancing community capital can reduce vulnerability and increase resilience (Roseland 2005). Healthy communities enhance multiple forms of community capital simultaneously (Haughton 1997). Though it is beyond the scope of this research to determine or quantify, how much of each form of capital will be present in a sustainable city, the results indicate that developing all forms of capital builds diversity in the city, making it
less vulnerable to future uncertainties and risk. Evidence that cities are utilizing the whole systems perspective offered by the FSSD (thus understanding the complexity and interrelations between city systems) is seen in the experienced benefits, which broadly cover all areas of community capital returns on investment.

4.1.5 The Resource Guide as a Strategic Tool

An aim of this thesis was to develop the community capital returns on investment, experienced by cities interviewed, into a resource guide (Appendix G) for engaging with senior level officials. The guide can be used as a tool at the strategic level of the FSSD, to facilitate prioritizing actions towards sustainability. In particular, the guide can assist in answering the third prioritization question, “does the measure provide adequate return on investment to seed future enhancements towards the vision?” Realized returns on investments are presented to provide an evidence base which supports initiatives that enhance the seven forms of community capital. For senior level decision makers, providing examples of on the ground success facilitates buy-in to sustainability initiatives.

Demonstrating improvements to the financial bottom line as a result of sustainability was noted by practitioners (Klasson 2009; Leung 2009) and city representatives (Pincott 2009; Statz 2009) as a major factor in engaging key municipal decision makers. It was therefore, a success that the survey results highlighted a high number of positive responses to economic/financial returns on investments experienced in cities as a result of sustainability initiatives. While expenditures related to sustainability measures may cost more initially, cities have found that operating and maintenance costs are expected to be lower (especially in the case of energy efficient buildings), giving long-term savings and paying back the initial investment over a short period of time. The resource guide will emphasize the potential economic/financial benefits achievable in a city moving towards sustainability, by including specific examples of positive returns in both municipal operations and the wider community.

Though economic/financial benefits were cited earliest in interviews with practitioners and city staff, discussion around demonstrating a link between sustainability, community engagement, and the quality of life and health of citizens was also highlighted as a means of achieving senior-level buy-in with cities. One city representative emphasized that a mindset shift is
occurring in cities, moving attention away from pursuing financial goals to developing more social wealth (Pincott 2009). As this shift continues, municipal leaders may come to recognize that fostering community development is critical for moving towards sustainability. The authors found a growing recognition among city staff interviewed that human, social and cultural capitals may become the most important assets amongst cities on their move towards sustainability (Ascroft 2009; Caudill 2009; Johnson 2009; Jose 2009). Each of these forms of capital require continuous enhancement efforts, and are long-term investments in changing norms, increasing competencies and building social fabric (Roseland 2005, 9-13). The resource guide demonstrates positive human, social and cultural returns on investment achievable in a city moving towards sustainability, to provide an evidence base in support of full integration of sustainability into municipal operations.

Cities are complex systems with dynamic interrelationships between all aspects of community assets. Therefore, they require a multi-scale response to move strategically towards sustainability. The resource guide introduces the global sustainability challenge, emphasizes the importance of backcasting from a vision constrained by the four SPs, and links forms of community capital in a whole systems approach to move towards sustainability. When sustainability is incorporated holistically into municipal policies and strategies, collaborations among city departments can emerge that allow the organization to deal with potential trade-offs and grey areas of decision-making (Leung 2009). Incorporating sustainability provides a greater understanding of the full cost and potential benefit of decisions to each form of community capital. Cities should aim for balanced development of the forms of community capital, creating a diversity of community programs to enhance the municipality’s resiliency when faced with future uncertainties and challenges (Haughton 1997; Roseland 2005, 6-12). The resource guide aims to address vulnerability and barriers within cities, by building a case for community capital development that emphasizes the link between capital assets and city resiliency.

Sustainability initiatives are more likely to meet the city’s goals if they integrate and strengthen more than one form of community capital (Hancock 2001). The guidebook emphasizes this point by sharing valid examples of cities realizing multiple returns on investments as a result of measures, which balance the forms of community capital. For example, in Pickering, collaboration between the construction industry and the
municipality was established in order to achieve a sustainable development strategy for a centrally located greenfield area, the Seaton Community (Melymuk et al. 2009; City of Pickering 2007). By working with industry, Pickering is building human capital and social capital within the municipality and business, by developing collaboration between public and private groups. In developing the Seaton Community, Pickering expects improvements in physical capital through more sustainable infrastructure, improving the urban form of the city while reducing demands on natural capital.

4.2 Validity of Results

The diversity of responses from interviews conducted with 36 sustainability practitioners, city staff members and current and former city officials give the authors confidence that the results, especially the motivators and drivers encouraging cities to consider sustainability and the barriers and challenges cities face when moving towards sustainability, are valid. The commonalities between cities, despite their diverse situations and different levels of experience with sustainability, demonstrate that there has been coverage of many of the relevant issues. In addition, the authors were able to identify and present unique motivators and drivers and barriers and challenges based on the broad research range of city sizes and situations.

The results obtained from the representatives in 17 cities provided the information to build our list of benefits, and enabled us to link these benefits to the seven forms of community capital. Each individual that filled out a survey had an accompanying interview for clarification and to elaborate on the information provided regarding the benefits the city has experienced as a result of moving towards sustainability. There may be some inconsistencies on how individuals responded to the survey, depending on how they interpreted the questions. For example, some respondents replied positively to results for which they had only anecdotal supporting evidence, while other individuals replied positively only to items in which they could present numerical supporting evidence. Though the authors attempted to accurately portray each interviewed city, they are not confident enough in the responses to conduct a statistical analysis of results. To address this, the benefits were presented qualitatively and represent general conclusions when making claims regarding differences and commonalities.
The economic recession at the time of writing (2009) affected all of the cities interviewed to various degrees. This may have impacted the validity of some of our community capital return results. The contraction in local and national economies has resulted in lower employment levels, less economic resiliency, and many businesses scaling back or ceasing operations. Tourism has also been affected. Cities are also experiencing an greater demands on municipal operations as a result of the recession. While cities aim to maintain high quality services to citizens, they must do so with reduced resources, meaning there is less money to invest in sustainability measures and planning, and less staff time to implement initiatives (Klasson 2009; Lahti 2009). At the same time, other departments face the challenge of declining work load or revenue generation (i.e. permitting departments are likely to face reductions in building permit requests).

Another challenge to the validity of the results comes from the relative novelty of sustainability initiatives in many of the cities we have interviewed. Six of the cities interviewed were in either the first or second year of implementing and monitoring sustainability measures. Though these cities have gained recognition for their sustainability progress, they are either too early in the process to have noted benefits, or have not been able to support the anecdotal benefits they claim with monitoring data. Therefore, some of the negative responses do not necessarily represent a lack of improvements from sustainability initiatives, but are the result of a deficiency in evidence due to insufficient progress on the measure. Despite not having concrete evidence of benefits, it is encouraging to note that these cities are generating momentum towards sustainability and are continuing to develop measures to build upon their early successes.

4.3 Weaknesses

There are a couple of gaps in the research undertaken. The authors’ wished to speak with a diverse range of cities, representing differing economic, social and environmental situations. While the authors are confident in the base of information gathered through interviews with 17 cities, the range between developed and developing situations was not as diverse as hoped. The city represented are mostly from North America (largely Canada), Europe (largely Sweden) and Australia. Efforts to contact cities in Asia were not successful, and there was only peripheral success in reaching Latin American and African cities, through second-hand discussions. The
resource guide is intended to be applicable across every situation; however, the lack of representation from all regions of the world may limit its flexibility. During initial interviews with practitioners with global work experience, resulting from projects set in many regions of the world (e.g. Nyoni 2009; Greenhow 2009; Klasson 2009; Kruger 2009; Lahti 2009), it was noted that it may not be possible to put together a guide which is practical for every country or city globally. This hesitation was borne from knowledge of varying country policies, structures and finances available to cities, leading to an extreme array of circumstances.

Another potential weakness is the lack of depth and breadth of information collected from responding cities. The individuals interviewed gave between one and four hours of time for interviews, responding to surveys and confirming results. While the contributions benefitted the research tremendously, the short contact period did not allow for depth in information, and the results remain very high level. The authors wished to retrieve detailed data to support on-the-ground examples, and generate strong evidence for claims made regarding community capital returns on investment experienced. The lack of specific details could lessen the efficacy of the resource guide, and may solely provide practitioners with an overview of best practices and results of sustainability initiatives.

Many cities are in the early stages of implementing and monitoring sustainability initiatives. The authors believe that the results provide a snapshot of some of the early benefits that cities are currently noticing, and are not representative of the full benefits that municipalities will witness as sustainability momentum builds and programs progress. City representatives mentioned that providing on the ground, relevant examples of success is a critical component of achieving senior-level buy-in. It remains unclear if the early rewards that have been reported will be compelling enough to interest senior level officials.

4.4 Recommendations for Further Research

Cities in less developed countries face different challenges to enhancing the seven forms of community capital, and, therefore research of the barriers and challenges specific to these conditions would add value to the existing body of work. In addition, the strategies and best practices for overcoming these barriers would be of particular interest. Demonstrating a range of benefits these cities have experienced as a result of moving towards
sustainability would add evidence that could engage senior level officials facing similar positions.

Two leverage points within cities were recognized in this research: citizen engagement, empowerment and action; and actions by the municipal authority in charge of implementing policies and practices. This research focused predominantly on leverage existing within municipal operations, and practitioners would benefit from further research regarding techniques for engaging local authorities to change specific policies or adopt particular best practices. This could include an understanding of how to preserve the forms of capital once they are built, and whether certain capital areas erode more quickly than others if not actively maintained. Further research exploring the details of best practices adopted by cities to build and maintain capital would add depth and applicability to the findings.

This study attempted to cover the benefits that cities are experiencing both within municipal operations and more broadly within the whole community. The business and economic benefits were considered as part of the community benefits. Nyoni (2009) stated that businesses within a city rarely design their production to link with the resource and development needs of the city. Therefore, future research into the mechanisms of interaction between cities and business stakeholders is warranted. As well, an increased understanding of the potential that lies within networks of stakeholders to move cities towards sustainability would support the findings regarding enhancing human and social capital.

The Real Change program currently being initiated through The Natural Step International, Blekinge Institute of Technology, and Lund University (BTH 2009), was established to support sustainability research. The global sustainability challenge that faces society is larger than a single issue and no problem can be addressed in isolation from the others (BTH 2009). The sustainability challenge in cities results, at least in part, from the fraying of formerly close ties between cities and surrounding regions (Haughton 1997). The current unsustainable city system relies heavily on external resources to meet the needs of society, and has lead to an increasingly vulnerable situation where the city’s ability to deal with future uncertainties and risks is minimized. In addition, many cities do not yet recognize the links between sustainability and local resiliency. The authors feel that this research was an important step towards assisting cities in both reducing their vulnerability and in developing and balancing the multiple forms of community capital.
Attempts to move towards sustainability without considering the external impacts of urban behaviour on surrounding areas will not be sufficient to achieve a sustainable society. In this context, sustainable urban development requires strategic decision making that originates from and understanding of the interrelationships among and between systems (BTH 2009). Assessing the relationships between cities and surrounding regions was beyond the scope of this thesis. The authors feel that the forms of community capital could be linked to the regional development petal of the Real Change Program, by developing projects that consider city and city-region sustainability as a way to address the global sustainability challenge. A research question could be: “How can cities and regions plan, using the community capital model, to decrease local vulnerability?”
5 Conclusion

This thesis studied the forms of community capital as a component of sustainable city development. The research was conducted within the city scope of internal municipal operations as well as the wider community. Motivators and drivers were sought to understand the forces behind the sustainability movements in cities. Challenges and barriers were discovered in order to develop support and evidence to overcome these issues. While financial considerations were expected to be among the largest driving forces (and for some cities they were), human and political capitals appeared to be both the strongest driving forces towards and biggest barrier against sustainability momentum in cities. This result reflects the fact that for sustainable city development to occur, the knowledge and efforts of residents and municipal staff are essential, and highlights the importance of citizen engagement and of democratizing the decision-making process within municipalities (Bridger and Luloff 2001).

Cities experienced the full range of community capital returns on investment as a result of sustainability initiatives. Therefore, it can be concluded that considering community capital was an appropriate model for discovering the benefits achievable by a city on its move towards sustainability. Critical links between the forms of community capital were established, and it was discovered that successful and rewarding initiatives were often those which strengthened and nurtured multiple forms of community capital. These finding are supported in the literature (Hancock 2001; Roseland 2005, 14), and so it can be recommended that local government decisions, programs and policies should be reviewed to ensure that community capital is properly considered (Roseland 2005, 14).

Enhancing multiple forms of community capital was also established as a potential way to increase a community’s resiliency. An analysis of cities using the FSSD to move towards sustainability found that these cities were more likely to realize balanced returns on investments among community capitals, compared with cities using other models or frameworks. This result is partially attributed to the whole systems perspective offered by backcasting from a shared vision of success that is constrained by the four SPs. In addition, some cities (Madison and Whistler) recognize that a shared community vision adds value to the human, social and cultural capitals, including a common language for exciting and engaging citizens and stakeholders for greater collaboration (Statz 2009; MacKay 2009).
Many cities have already begun the process towards sustainability, and are discovering early rewards along the way for doing so. Through the development of a resource guide for practitioners to engage with senior level officials on sustainability issues, this thesis targets the leverage that can be achieved within municipal operations. The resource guide provides compelling examples and demonstrates the community capital returns on investment achievable by cities moving towards sustainability. The resource guide incorporates many of the results gathered through this thesis and aims to be a strategic tool by aiding the facilitation of prioritizing actions towards sustainability.

Cities hold the potential to drive movement towards global sustainability with a mobilizing force of engaged citizens; an understanding of local issues; and by being centres for innovation and creativity. Global sustainability calls for a fundamental change in the way societies manage and govern urban centres. Each city will require specific solutions and practices to address their challenges and barriers. Future steps towards global sustainability will call for cities to establish links locally between government, citizens and stakeholders as well as externally with other levels of government and neighbouring regions. Cities can contribute to a sustainable society by improving their own long term survival within a regional context, using resources and materials more effectively and becoming more resilient and self-reliant. The results gathered through this thesis build a case for cities to consider sustainability and demonstrate the rewards to the community in forms of natural, physical/built, economic/financial, social, human, cultural and political aspects.
References


Ascroft, C. 2009. Project Manager, Triple Bottom Line, City of Calgary. Interview with the authors, Calgary, Alberta, 20 March 2009.

Bekkering, M. 2009. Manager, Implementation & Support, Toronto Environment Office. Interview with the authors, Toronto, ON and Karlskrona, Sweden, 31 March 2009.


Deacoff, C. and P. Townsend. 2009. Environmental Performance Officer (Deacoff) and Acting Director, Infrastructure and Asset Management (Townsend), Halifax Regional Municipality. Interview with the authors, Halifax, NS and Karlskrona, Sweden, 1 April 2009.


Freudenthal, E. 2009. Director of Communications, GlasHus Ett. Interview with the authors, Stockholm and Karlskrona, Sweden, 1 April 2009.

Gleeson, D. and K. Kofoed. 2009. Head, Planning Department (Gleeson) and Fulbright Exchange with City of Dublin - Senior Urban Planner, City
of Seattle (Kofoed). Interview with the authors, Dublin, Ireland and Karlskrona, Sweden, 27 March 2009.


Harrington, J. 2009. Partner, RealEyes Sustainability Ltd. Interview with the authors, Dublin, Ireland and Karlskrona, Sweden, 18 February 2009.


Jose, J. 2009. Senior Strategist, City of Sydney. Interview with the authors, Sydney, NSW, Australia and Karlskrona Sweden, 8 April 2009.


McGinnis, J. 2009. Chair, Durham Sustain Ability. Interview with the authors, Brougham, Ontario and Karlskrona, Sweden. 11 February 2009.


Melymuk, T., R. Taylor and C. Whitaker. 2009. Acting Chief Administrative Officer and Director, Office of Sustainability (Melymuk); Coordinator, City Development (Taylor); and Coordinator, Sustainability (Whitaker). Interview with the authors, Pickering, ON and Karlskrona, Sweden. 13 March 2009.


Mogavero, S. 2009. Project Manager, Morbegno 2020. Interview with the authors, Morbegno, Italy and Karlskrona, Sweden, 19 March 2009.


Taylor, D.M. 1994. Ch. 7 - The Transition to a Sustainable Canadian Society. In Off Course - Restoring Balance between Canadian Society and


Appendix A

The History of Sustainability in Cities

The roots of the concept of sustainability, using a triple bottom line concept of social, environmental and economic sustainability, can be traced to Hans Carl von Carlowitz, who noted the impacts of the unsustainability of the German forestry industry in 1713 (Edinger and Kaul 2003, 5). Attempts to conceive cities as environmentally, socially and economically sustainable places began form through the late 1950’s and the 1960’s by Jane Jacobs (2009), Ian McHarg (2009) and William H. Whyte (Whyte and LaFarge 2000, 123-140). These individuals were critical of suburbanisation and of the model of urban renewal being practiced at that time, which reduced density, increased automotive dominance in urban areas, and lead to the razing of existing urban neighbourhoods. The Club of Rome (Meadows et al. 2009) brought sustainable development to the fore in 1972 with “The Limits to Growth,” and provided language around sustainability. This was later developed and popularized by the United Nations’ World Commission on Environment and Development (WCED 1987, 8-9), which also undertook an analysis of cities and their role in sustainability (WCED 1987, 235-258).

Following up on the WCED, the United Nations held the Conference on Environment and Development (UNCED, or the Rio Conference) in 1992. Here, the UN established Agenda 21, a sustainable development action plan for the 21st century. Under Agenda 21, the International Council for Local Environmental Initiatives (ICLEI) established a program to support local governments to develop their own Local Agenda 21 (LA21) strategies (Roseland 2005, 211), one of the first major initiatives to encourage sustainability at the city level. Between 1992 and 2001, over 6,400 local governments in 113 countries either made a formal commitment to LA21 campaigns or were actively moving towards this commitment (ICLEI 2002). Agenda 21’s focus on local governance was outlined in Chapter 28 of the Agenda 21 resolution (United Nations Environment Programme 2000):

Local authorities construct, operate, and maintain economic, social and environmental infrastructure, oversee planning processes, establish local environmental policies and regulations, and assist in implementing national and subnational environmental policies. As the level of governance closest to the people, they play a vital role in educating, mobilizing, and responding to the public to promote sustainable development.
Appendix B

Lists of Interviewees and Expert Panel Members

Through this project, sustainability practitioners and city representatives were contacted to provide information relating to sustainability in cities. The authors are grateful for the time and the knowledge provided by these practitioners. Table B-1, Table B-2 and Table B-3 list the people interviewed in compiling this report and the expert panel members who provided feedback to improve the resource guide.

Table B-1. List of sustainability practitioners consulted

<table>
<thead>
<tr>
<th>Contact Person</th>
<th>Organization</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alaya Boisvert</td>
<td>The Natural Step Canada</td>
<td>Vancouver, BC, Canada</td>
</tr>
<tr>
<td>Chris Lindberg</td>
<td>The Natural Step Canada</td>
<td>Ottawa, ON, Canada</td>
</tr>
<tr>
<td>Stanley Nyoni</td>
<td>The Natural Step International</td>
<td>Stockholm, Sweden</td>
</tr>
<tr>
<td>Bob Willard</td>
<td>Independent Consultant</td>
<td>Whitby, ON, Canada</td>
</tr>
<tr>
<td>Eric Ezechieli</td>
<td>The Natural Step Italy</td>
<td>Morbegno, Italy</td>
</tr>
<tr>
<td>Torbjörn Lahti</td>
<td>Sustainable Sweden Association</td>
<td>Umeå, Sweden</td>
</tr>
<tr>
<td>Helen Clarkson</td>
<td>Forum For The Future</td>
<td>London, UK</td>
</tr>
<tr>
<td>Jack McGinnis</td>
<td>Durham SustainAbility</td>
<td>Pickering, ON, Canada</td>
</tr>
<tr>
<td>Tim Greenhow</td>
<td>Sustainable Sweden Association</td>
<td>Stockholm, Sweden</td>
</tr>
<tr>
<td>John Harrington</td>
<td>RealEyes Sustainability</td>
<td>Dublin, Ireland</td>
</tr>
<tr>
<td>Anna Linell</td>
<td>Sveriges Ekokommuner</td>
<td>Helsingborg, Sweden</td>
</tr>
<tr>
<td>Lars Thunberg</td>
<td>Sveriges Ekokommuner</td>
<td>Helsingborg, Sweden</td>
</tr>
<tr>
<td>Ruan Kruger</td>
<td>The Development Bank of Southern Africa</td>
<td>Johannesburg, South Africa</td>
</tr>
<tr>
<td>Klas Klasson</td>
<td>Stockholms Län</td>
<td>Stockholm, Sweden</td>
</tr>
<tr>
<td>Pong Leung</td>
<td>The Natural Step Canada</td>
<td>Vancouver, BC, Canada</td>
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</tbody>
</table>

78
<table>
<thead>
<tr>
<th>Interview Participant</th>
<th>Position</th>
<th>City, Region, Country</th>
</tr>
</thead>
<tbody>
<tr>
<td>Laura MacKay</td>
<td>Manager, Community Planning and Business Strategies</td>
<td>Whistler, BC, Canada</td>
</tr>
<tr>
<td>Sarah Nilsson</td>
<td>Head of Strategic Environmental Issues</td>
<td>Växjö, Kronoberg, Sweden</td>
</tr>
<tr>
<td>Tom Melymuk</td>
<td>Acting Chief Administrative Officer; Director, Office of Sustainability</td>
<td>Pickering, ON, Canada</td>
</tr>
<tr>
<td>Ron Taylor</td>
<td>Coordinator, City Development</td>
<td>Pickering, ON, Canada</td>
</tr>
<tr>
<td>Chantal Whitaker</td>
<td>Coordinator, Sustainability</td>
<td>Pickering, ON, Canada</td>
</tr>
<tr>
<td>Lisa Wälitalo</td>
<td>Energy Coordinator and Project Manager</td>
<td>Karlskrona, Blekinge, Sweden</td>
</tr>
<tr>
<td>Andrew Statz</td>
<td>Fiscal Efficiency Auditor</td>
<td>Madison, WI, USA</td>
</tr>
<tr>
<td>Stefano Mogavero</td>
<td>Project Manager</td>
<td>Morbegno, Lombardia, Italy</td>
</tr>
<tr>
<td>Cathy Ascroft</td>
<td>Project Manager, Triple Bottom Line</td>
<td>Calgary, AB, Canada</td>
</tr>
<tr>
<td>Brian Pincott</td>
<td>Alderman, Ward 11</td>
<td>Calgary, AB, Canada</td>
</tr>
<tr>
<td>Sally Caudill</td>
<td>Communication and Environmental Care Coordinator</td>
<td>Canmore, AB, Canada</td>
</tr>
<tr>
<td>Paul MacLatchy</td>
<td>Director, Sustainability &amp; Growth, Strategy, Environment &amp; Communications</td>
<td>Kingston, ON, Canada</td>
</tr>
<tr>
<td>Dick Gleeson</td>
<td>Head, Planning Department</td>
<td>Dublin, Ireland</td>
</tr>
<tr>
<td>Kristian Kofoed</td>
<td>Fulbright Exchange with City of Dublin / Senior Urban Planner, City of Seattle</td>
<td>Dublin, Ireland</td>
</tr>
<tr>
<td>Sara Blenkhorn</td>
<td>Project Manager for International Centre for Sustainable Cities, Dar Es Salaam</td>
<td>Karlskrona, Sweden (formerly of Dar Es Salaam, Tanzania)</td>
</tr>
<tr>
<td>Mark Bekkering</td>
<td>Manager, Implementation &amp; Support</td>
<td>Toronto, ON, Canada</td>
</tr>
<tr>
<td>Jan-Olof Andersson</td>
<td>Coordinator of Sustainable Development</td>
<td>Falkenberg, Halland, Sweden</td>
</tr>
<tr>
<td>Erik Freudenthal</td>
<td>Director of Communications, GlasHus Ett, Hammarby Sjöstad</td>
<td>Stockholm, Sweden</td>
</tr>
<tr>
<td>Ingmarie Ahlberg</td>
<td>Head of Environment, Planning Administration</td>
<td>Stockholm, Sweden</td>
</tr>
<tr>
<td>Cameron Deacoff</td>
<td>Environmental Performance Officer</td>
<td>Halifax, NS, Canada</td>
</tr>
<tr>
<td>Philip Townsend</td>
<td>Acting Director, Infrastructure and Asset Management</td>
<td>Halifax, NS, Canada</td>
</tr>
<tr>
<td>Greg Johnson</td>
<td>Former Mayor and Councillor, Nillumbik Shire Council</td>
<td>Melbourne, Victoria, Australia</td>
</tr>
<tr>
<td>Jane Jose</td>
<td>Senior Strategist</td>
<td>Sydney, NSW, Australia</td>
</tr>
</tbody>
</table>
Table B-3. Expert panel members and affiliations

<table>
<thead>
<tr>
<th>Expert Panel Member</th>
<th>Organization</th>
<th>Location</th>
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<tbody>
<tr>
<td>Stanley Nyoni</td>
<td>The Natural Step International</td>
<td>Stockholm, Sweden</td>
</tr>
<tr>
<td>Pong Leung</td>
<td>The Natural Step Canada</td>
<td>Vancouver, BC, Canada</td>
</tr>
<tr>
<td>Bob Willard</td>
<td>Independent Consultant</td>
<td>Whitby, ON, Canada</td>
</tr>
<tr>
<td>Jack McGinnis</td>
<td>Durham SustainAbility</td>
<td>Pickering, ON, Canada</td>
</tr>
<tr>
<td>Antoine Belaieff</td>
<td>Clinton Climate Initiative</td>
<td>Toronto, ON, Canada</td>
</tr>
<tr>
<td>Anna Linell</td>
<td>Sveriges Ekokommuner</td>
<td>Helsingborg, Sweden</td>
</tr>
<tr>
<td>Ruan Kruger</td>
<td>The Development Bank of Southern Africa</td>
<td>Johannesburg, South Africa</td>
</tr>
<tr>
<td>Tamara Connell</td>
<td>Blekinge Institute of Technology</td>
<td>Karlskrona, Sweden</td>
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</table>
Appendix C

Questions for Sustainability Practitioners

The authors conducted interviews with 13 sustainability practitioners through the course of this thesis. To engage the practitioners and to direct the responses so that they were useful, the authors developed this set of questions (note that, for the first three interviews (e.g. with Alaya Boisvert, Stanley Nyoni and Bob Willard, this template was not in place). The questionnaire was sent to each practitioner in advance of the interview, in order to prepare practitioners for the interview and give them an understanding of the request.

1. When you begin working with a city, do you typically approach them, or do they approach you?
2. We recognize that the goals and operations of a municipality are different than those of business. When you are in conversation with cities, what type of language do you use to engage them in sustainability?
3. In your experience, what are three to five of the main reasons that cities are moving towards sustainability? What or who are the biggest drivers behind these reasons? (E.g. Energy costs, environmental crises, citizen demand)
4. In contrast, what are three to five of the barriers that you find that hamper cities from progressing towards sustainability? (E.g. Senior level buy in, lack of time and resources, short term planning)
5. How would a good 'case' for sustainability address the barriers and support the drivers you identified? What five to seven benefits of implementing sustainability initiatives in cities would you include? (e.g. Return on investments: economic, natural, physical/built, human, social and cultural)
6. As part of our thesis topic, we aim to develop a vision of a sustainable city so that we can be confident that the 'sustainability case(s) for cities' developed will move them in the right direction. What are some the key 'success' criteria that you believe will be demonstrated by a city that is moving towards sustainability?
Appendix D

Questions for City Officials and Politicians

The authors conducted interviews with 23 city representatives, in 19 interviews over 17 cities through the course of this thesis. To engage the city officials and politicians and to collect responses that would assist in building our results, the authors developed this set of questions. The questionnaire was sent to each official in advance of the interview, in order to prepare them for the interview and give them an understanding of the request.

1. As mentioned, we're contacting you because of your city's reputation and its measures towards sustainability. Could you list four to six of the drivers that encouraged your city to move towards sustainability? Examples of drivers include energy savings, environmental damage, citizen demand, and a charismatic leader who believed passionately in sustainability.

2. In contrast, could you list four to six of the biggest barriers for your city in its progression towards sustainability? Examples of barriers include staff buy in, lack of resources, or time restrictions.

3. What are your four to six of your city's largest expenses? Do you feel that these expenses can be reduced by implementing sustainability measures, and if so, how?

4. We are trying to understand what the biggest benefits are for cities when they incorporate sustainability into all aspects of operations and services. In the following survey (Appendix E), please mark the items which you feel your city has benefited from as a result of sustainability initiatives already implemented in your city?

5. How would you rate your cities progress towards sustainability?

6. Based on your experiences and successes, how would you convince other cities about the importance of sustainability?
Appendix E

Survey of Benefits of Moving towards Sustainability for Cities

The following survey was developed to assess progress in cities that have begun their move towards sustainability.

1) Please provide your name, your position and the city you work for.

2) From the following list, please mark the items that you feel your city has benefited from as a result of sustainability initiatives already implemented.

<table>
<thead>
<tr>
<th>Benefit accrued</th>
<th>Yes</th>
<th>No</th>
<th>Unsure / Do Not Monitor</th>
</tr>
</thead>
<tbody>
<tr>
<td>Improved air quality</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Improved water resource access (quality and quantity)</td>
<td></td>
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<tr>
<td>Reduced ecological footprint (e.g. fewer greenhouse gas emissions, less water waste, less solid waste generated, greater percentage of food demand met from local sources)</td>
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<tr>
<td>Reduced exposure to future uncertainties and risks (e.g. resource constraints, insurance costs, preparedness for natural disasters)</td>
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<td>Increased waste diversion rates (e.g. recycling, compost)</td>
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<tr>
<td>Increased number of green buildings (e.g. LEED certification, green roofs, district heating/cooling)</td>
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<tr>
<td>Increase in use of public transit/reduction in private vehicle use</td>
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<td>Savings through project sharing (i.e. through realizing project overlaps and collaborating on joint initiatives)</td>
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<tr>
<td>Increased citizen engagement through greater number of community sustainability initiatives</td>
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<tr>
<td>Increased citizen loyalty, trust and satisfaction; attracting and retaining citizens, esp. skilled workforce</td>
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<tr>
<td>Improved/sufficient affordable housing opportunities</td>
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</tbody>
</table>
**Benefit accrued** | Yes | No | Unsure / Do Not Monitor
--- | --- | --- | ---
Reduced crime rates
Strengthened culture of creativity and innovation (both within and external to municipal operations)
Increasingly diverse and resilient local economy (e.g. attracting innovative businesses)
Higher employment levels
Improved citizen health and quality of life
Greater tourism market share
New revenue opportunities (e.g. easier financing) and increased market share (e.g. increased investment in city from external sources)

Other benefits (please specify):

3) From the following list, please mark the items that you feel your municipal operations have benefited from as a result of sustainability initiatives already implemented.

<table>
<thead>
<tr>
<th>Benefit accrued</th>
<th>Yes</th>
<th>No</th>
<th>Unsure / Do Not Monitor</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cost savings in energy use in municipal buildings</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cost savings in water use in municipal buildings</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cost savings for solid waste management (e.g. waste collection and disposal, landfills)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cost savings in transportation (fleet costs and fuel costs)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cost savings on road/water/energy infrastructure (development, operation, maintenance)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>City employee loyalty and trust (e.g. productivity, staff retention, ease of recruitment)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Staying ahead of new externally imposed environmental laws or taxes</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Improved internal decision-making process</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Benefit accrued</td>
<td>Yes</td>
<td>No</td>
<td>Unsure / Do Not Monitor</td>
</tr>
<tr>
<td>--------------------------------------------------------------------------------</td>
<td>-----</td>
<td>----</td>
<td>-------------------------</td>
</tr>
<tr>
<td>Integration of sustainability into all departments for greater collaboration between departments</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cohesive and innovative policy decisions (e.g. capital investment guidelines, environmental management systems, green procurement strategy)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Long term planning that also addresses current issues</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Other benefits (please specify):

4) For any of the items in questions 2 or 3 that you marked ‘Unsure/Do not monitor’, can you please provide the contact details for the person who is able to access this information?
## Appendix F

### Information about cities interviewed

Table F-1 contains geographical and population facts about the cities interviewed during this project.

*Table F-1. List of cities interviewed and brief geographical synopsis*

<table>
<thead>
<tr>
<th>Location</th>
<th>Country</th>
<th>Location</th>
<th>Population</th>
</tr>
</thead>
<tbody>
<tr>
<td>Växjö Kommun</td>
<td>Sweden</td>
<td>Southeastern (inland, lake region; Småland)</td>
<td>80,000</td>
</tr>
<tr>
<td>Karlskrona Kommun</td>
<td>Sweden</td>
<td>Southeastern (coastal; Blekinge)</td>
<td>60,000</td>
</tr>
<tr>
<td>Falkenberg Kommun</td>
<td>Sweden</td>
<td>Southeastern (coastal; Halland)</td>
<td>40,000</td>
</tr>
<tr>
<td>Hammarby Sjöstad</td>
<td>Sweden</td>
<td>Neighbourhood in Stockholm</td>
<td>10,000</td>
</tr>
<tr>
<td>Stockholms Kommun</td>
<td>Sweden</td>
<td>Eastern (coastal, archipelago)</td>
<td>800,000</td>
</tr>
<tr>
<td>City of Kingston</td>
<td>Canada</td>
<td>Southeastern Ontario (coastal, lake)</td>
<td>117,000</td>
</tr>
<tr>
<td>City of Toronto</td>
<td>Canada</td>
<td>Southern Central Ontario (coastal, lake)</td>
<td>2,500,000</td>
</tr>
<tr>
<td>City of Pickering</td>
<td>Canada</td>
<td>Southern Central Ontario (coastal, lake)</td>
<td>100,000</td>
</tr>
<tr>
<td>Town of Canmore</td>
<td>Canada</td>
<td>Southwestern Alberta</td>
<td>12,000</td>
</tr>
<tr>
<td>City of Calgary</td>
<td>Canada</td>
<td>Southern Central Alberta (plains/prairies)</td>
<td>1,040,000</td>
</tr>
<tr>
<td>Resort Municipality of Whistler</td>
<td>Canada</td>
<td>Southwestern British Columbia (valley in the Rocky Mountains)</td>
<td>10,000</td>
</tr>
<tr>
<td>Halifax Regional Municipality</td>
<td>Canada</td>
<td>Southeastern Nova Scotia (coastal, ocean)</td>
<td>373,000</td>
</tr>
<tr>
<td>City of Madison</td>
<td>USA</td>
<td>Southern Central Wisconsin (inland, lake region)</td>
<td>223,000</td>
</tr>
<tr>
<td>Town of Morbegno</td>
<td>Italy</td>
<td>North central Italy, near border with Switzerland (valley in the Alps)</td>
<td>11,000</td>
</tr>
<tr>
<td>Nillumbik Shire</td>
<td>Australia</td>
<td>Southern Victoria (near coast of a bay; outer suburb of Melbourne)</td>
<td>60,000</td>
</tr>
<tr>
<td>City of Sydney</td>
<td>Australia</td>
<td>Eastern New South Wales (coastal, bay)</td>
<td>168,000</td>
</tr>
<tr>
<td>City of Dublin</td>
<td>Ireland</td>
<td>Eastern (coastal, sea)</td>
<td>1,050,000</td>
</tr>
<tr>
<td>City of Dar Es Salaam</td>
<td>Tanzania</td>
<td>Eastern (coastal, sea)</td>
<td>2,500,000</td>
</tr>
</tbody>
</table>
Appendix G

Resource Guide for Practitioners

Due to page limitations, the resource guide is presented in a separate document, which can be found on the Blekinge Tekniska Högskola Arkiv EX website, uploaded with this thesis.
Appendix H

Results of survey – Positive Responses

Tables H-1 and H-2 disaggregate the positive responses to the survey question by cities into two categories – cities that have been using the FSSD to guide their move towards sustainability and cities that used other frameworks to integrating sustainability into their operations.

*Table H-1. Survey responses for community benefits for the two categories of cities*

<table>
<thead>
<tr>
<th>Community Benefits</th>
<th>FSSD</th>
<th>Other framework</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>%</td>
<td>%</td>
</tr>
<tr>
<td>Air quality</td>
<td>63</td>
<td>43</td>
</tr>
<tr>
<td>Improved water resource access (quality and quantity)</td>
<td>63</td>
<td>86</td>
</tr>
<tr>
<td>Reduced ecological footprint</td>
<td>50</td>
<td>86</td>
</tr>
<tr>
<td>Reduced exposure to future uncertainties and risk</td>
<td>38</td>
<td>86</td>
</tr>
<tr>
<td>Increased waste diversion rates</td>
<td>75</td>
<td>86</td>
</tr>
<tr>
<td>Increased number of green buildings</td>
<td>88</td>
<td>86</td>
</tr>
<tr>
<td>Increase in use of public transit/reduction in private vehicle use</td>
<td>50</td>
<td>58</td>
</tr>
<tr>
<td>Savings through project sharing</td>
<td>63</td>
<td>57</td>
</tr>
<tr>
<td>Increased citizen engagement though increased outreach activities</td>
<td>75</td>
<td>71</td>
</tr>
<tr>
<td>Increased citizen loyalty, trust and satisfaction; attracting and retaining citizens</td>
<td>38</td>
<td>29</td>
</tr>
<tr>
<td>Improved/sufficient affordable housing opportunities</td>
<td>38</td>
<td>29</td>
</tr>
<tr>
<td>Reduced crime rates</td>
<td>0</td>
<td>14</td>
</tr>
<tr>
<td>Strengthened culture of creativity and innovation</td>
<td>88</td>
<td>86</td>
</tr>
<tr>
<td>Increasingly diverse and resilient local economy</td>
<td>50</td>
<td>42</td>
</tr>
<tr>
<td>Higher employment levels</td>
<td>38</td>
<td>42</td>
</tr>
<tr>
<td>Improved citizen health and quality of life</td>
<td>63</td>
<td>14</td>
</tr>
<tr>
<td>Greater tourism market share</td>
<td>63</td>
<td>14</td>
</tr>
<tr>
<td>New revenue opportunities and increased market share</td>
<td>88</td>
<td>71</td>
</tr>
</tbody>
</table>
Table H-2. Survey responses on benefits to municipal operations for the two categories of cities

<table>
<thead>
<tr>
<th>Benefits to Municipal Operations</th>
<th>FSSD</th>
<th>Other Framework</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cost savings in energy use in municipal buildings</td>
<td>88</td>
<td>100</td>
</tr>
<tr>
<td>Cost savings in water use in municipal buildings</td>
<td>38</td>
<td>57</td>
</tr>
<tr>
<td>Cost savings for solid waste management</td>
<td>50</td>
<td>57</td>
</tr>
<tr>
<td>Cost savings in transportation</td>
<td>88</td>
<td>71</td>
</tr>
<tr>
<td>Cost savings on the development, operations and maintenance of infrastructure</td>
<td>38</td>
<td>42</td>
</tr>
<tr>
<td>City employee loyalty and trust</td>
<td>63</td>
<td>57</td>
</tr>
<tr>
<td>Staying ahead of new externally imposed environmental laws or taxes</td>
<td>88</td>
<td>86</td>
</tr>
<tr>
<td>Improved internal decision-making process</td>
<td>100</td>
<td>100</td>
</tr>
<tr>
<td>Integration of sustainability into operations for improved collaborations between departments</td>
<td>100</td>
<td>100</td>
</tr>
<tr>
<td>Cohesive and innovative policy decisions</td>
<td>100</td>
<td>100</td>
</tr>
<tr>
<td>Long term planning that also addresses current issues</td>
<td>100</td>
<td>100</td>
</tr>
</tbody>
</table>