

# Sustainability Planning: Frameworks, Principles & Management Tools

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# BIOS

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# ABSTRACT

Since the mid-nineties municipalities have increasingly taken on the challenge of developing practices that will ensure the long term sustainability of their communities. There are a variety of approaches that can be used to develop sustainability plans and a multitude of tools that can support the implementation of the plans. This paper reviews some of the most well known sustainability planning frameworks, principles and management tools used across Canada and internationally. Twelve examples are presented; three examples of sustainability frameworks, three examples of sustainability principles and six examples of sustainability management tools. For each of the examples, their core concepts are introduced along with their strengths and weaknesses. A few applications for each are also provided. The purpose of this paper is to outline the leading approaches and tools that should be considered when developing a sustainability planning process.

# INTRODUCTION

Traditionally, municipal planning is the result of short term decision making cycles driven by council priorities, fiscal budgets, stakeholder interests and public opinion. These drivers have made it challenging to consider the impact of these decisions in the future since the immediate needs and concerns take precedence. The net result of short term planning has both local and global impacts: compromised ecosystems, changing climate patterns, disconnected communities, rising health issues and people surrounded in wealth unable to meet their basic needs.

Since the mid nineties municipalities have increasingly taken on the challenge of developing practices that will ensure the long term sustainability of their communities. Several planning frameworks, sustainability principles and tools have been developed by organizations and companies to assist municipalities in their long term sustainability planning efforts. These efforts differ from conventional planning in so much as they ask communities to consider the impact of current trends continuing into the future. They also identify alternative and new approaches that not only address the impacts of current trends but also meet the community's desires for the future.

This paper reviews some of the most well known sustainability planning frameworks, principles and management tools used across Canada and Internationally.

# SUSTAINABILITY PLANNING FRAMEWORKS

Sustainability planning frameworks direct planning processes and provide a guiding structure for developing sustainability plans. They are used to provide a structure for setting the direction and aligning the community's existing policies, plans & actions onto a common, more sustainable path.

## Sheltair Adaptive Management Framework



### Concepts

The *Sheltair Adaptive Management Framework* (AMF) integrates the concept of adaptive management with a strategic planning framework. The AMF was developed by The Sheltair Group.<sup>1</sup> Municipalities use the framework as a means of organizing their Strategic Planning Process, Sustainability Plans, Energy and Emissions Plans, Official Plans, Sustainability Monitoring, State of the Environment Reporting, etc.

The Sheltair AMF can be conceptualized as a pyramid, made up of 6 core components and 3 adaptive elements. At the top of the pyramid is the vision, which describes how the community sees itself in the future. The layers underneath the vision substantiate how the community can achieve the vision. Being an 'adaptive framework', it recognizes that sustainability planning is an iterative process (feedback) and therefore assesses progress (monitoring) and modifies (alignment) the long-term direction as more information becomes evident.

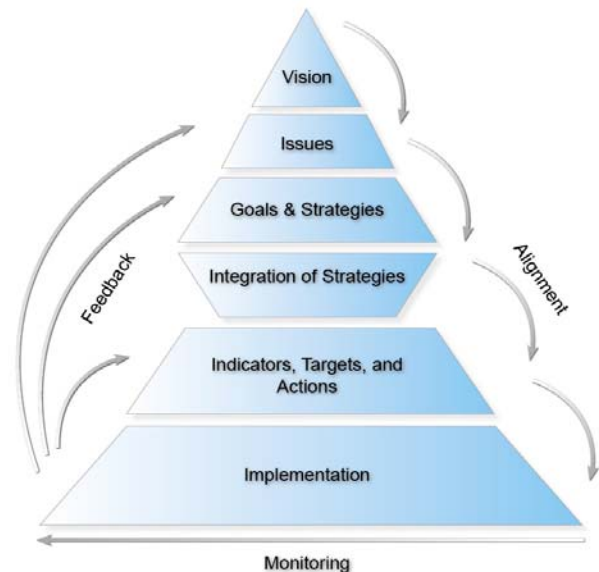


Figure 1. The Sheltair Adaptive Management Framework

**Vision:** The vision represents the starting point for the framework and sets the destination of what can be achieved through emissions reductions.

**Issues, Goals & Strategies** – *Goals* outline what the community is working towards to meet its long term vision. Goals are defined for specific *issue areas* that relate to core community systems, such as land use, energy use, natural areas, transportation, etc. Key *strategies* explore and identify the basic approaches or the best practices that can be implemented in order to achieve each goal.

**Integration** – The “integration” stage identifies and consolidates the synergies or conflicts prior to committing to actions. This is an essential stage when dealing with long-term planning, seeing that it allows the opportunity to simplify the complexities found in the collaborative efforts, various perspectives, multiple systems, and extended time horizons.

**Indicators, Targets & Actions** – *Indicators* and *targets* can be identified for each “strategy”. These form the quantifiable measurement of performance and tell us how well we are performing. Specific *actions* or detailed action plans provide a range of activities that can be implemented to achieve the vision, goals and targets.

**Implementation & Monitoring** – Implementation is the final stage in the Framework, and involves aligning policies to achieve desired actions that allow change to happen on the ground. Monitoring also begins at this point to track the community's performances in meeting their goals and targets in working towards achieving the plans vision.

<sup>1</sup> The Sheltair Group is a consulting firm based in Vancouver, BC and is now operating as part of Stantec Consulting.

## Strengths and Weaknesses

**Managing Complexities:** The Sheltair AMF helps solve the problem of organizing and communicating the complexities underlying collaborative long-term sustainability planning. The benefit of using this approach is that it aids in aligning the various levels of planning so that high-level, long-term direction is connected with specific, short-term actions.

**Monitoring & Learning:** It also allows the opportunity to monitor performance and to update plans and to adapt to changes without losing sight of the original intentions and the connections flowing from that. For example, if the vision changes over time, then all subsequent layers of the framework can be adjusted accordingly.

**A Guiding Framework not a Principle-based Framework:** One of its key strengths can also be seen as a weakness. The framework does not prescribe or define sustainability principles however it can incorporate any principle, goal or strategy that the user desires and it can be easily molded to fit any current planning framework, methods, and terminology. The framework is intended to be used as a guiding framework used to structure a planning process and implementation.

## Applications

The Sheltair Adaptive Management Framework can be applied at almost any scale or sustainability planning context – at a building design scale, at a community planning scale, for a comprehensive sustainability plan or detailed environmental master plan. One of the most comprehensive examples of using the Sheltair AMF was during the *citiesPLUS project* (cities Planning for Long-term Urban Sustainability). The AMF was used for this project to develop a 100-year Long-term plan for the Greater Vancouver Regional District. This was a 2-year long process that addressed the urban systems as one integrated system.

Other communities that have used the Sheltair AMF include University of British Columbia's Climate Action Plan, City of Fort St. John Community Energy and Emissions Plan, the City of Rossland's Sustainability Strategy, City of Victoria's Sustainability Framework and Dockside Green Monitoring Program.

### Concepts

ICLEI (International Council for Local Environmental Initiatives) launched Local Agenda 21 (LA21) Campaign as a participatory, long-term, strategic planning process to help municipalities identify local sustainability priorities and implement action plans at the local level.

LA21 was endorsed as part of Agenda 21. Chapter 28 of Agenda 21 identifies municipalities as the sphere of government closest to the people, and calls upon local authorities to consult with their communities, and develop and implement a local plan for sustainability.<sup>2</sup>

The LA21 process begins when a city endorses ICLEI's Local Agenda 21 Declaration, the Aalborg Charter, or other equivalent regional charters. Through this commitment they agree to undertake participatory planning processes aimed at creating and implementing a sustainability plan. Municipal councils commit to completing five milestones that gauge the progress of the participants in meeting the campaign objectives (see textbox for LA21 Campaign Milestones).

#### **LA 21 Campaign Milestones:**

1. **Establish stakeholder groups**, consisting of representatives from all sectors of the community, that will be develop and implement the LA21 Campaign milestones.
2. **Complete a sustainability audit** considering social, economic, and environmental conditions and trends in the community.
3. **Complete a sustainable community vision** for the future, based on community review of the audit and assessment of priorities.
4. **Create an LA21 action plan**, identifying clear goals, priorities, measurable targets, roles and responsibilities, funding sources, and work activities.
5. **Establish a community-based monitoring program** that reports on performance in achieving the LA21 action plan, using locally appropriate indicators.

Source: [www.iclei.org](http://www.iclei.org)

### Strengths and Weaknesses

**Participatory Planning Model:** LA21 process uses an inclusive approach to developing action plans which is led by stakeholder groups. This helps to assure the plan is not only supported by the community but will also help identify community leaders who will work with the local government to implement the plan.

**Sustainability Commitment:** Cities begin the LA21 planning process by endorsing a relevant sustainability charter or declaration. This first step establishes the community's commitment to building a sustainable future. Having a Council commitment helps to ensure the required support for sustainability planning is continued through the planning process.

**High Level Process with Supporting Tools:** The planning process outlines high level milestones that can be met with the help of various supporting tools developed by ICLEI, including Sustainability Assessment Survey, Triple Bottom Line Assessments, and EcoBudget. The planning process itself is quite broad and non-prescriptive, this allows communities to define how their own planning process.

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<sup>2</sup> [www.iclei.org](http://www.iclei.org) -see Local Agenda 21

## Applications

Hamilton's Vision 2020, an early sustainable-community plan that has been updated every five years since 1992, is an example of a Local Agenda 21 community planning process. The City of Montreal's Strategic Sustainable Development Plan is also based on Agenda 21.

## The Natural Step Framework

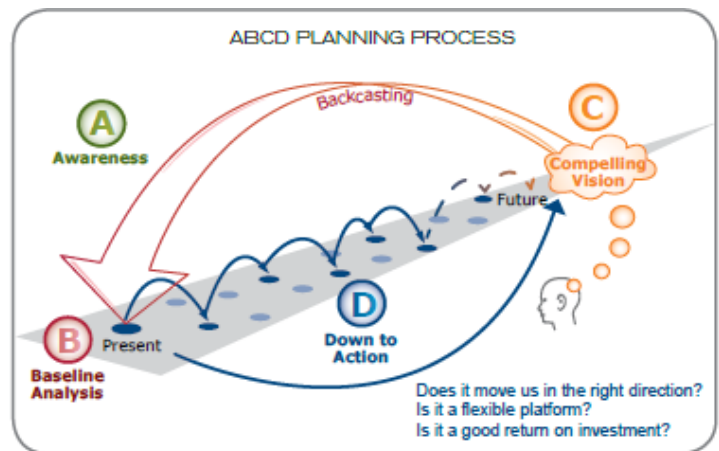


### Concepts

The Natural Step (TNS) was developed in Sweden in the 1980s. The TNS framework combines a science-based understanding of sustainability with a strategic planning approach for developing community sustainability plans. The science behind the TNS Framework is the *four system conditions for sustainability* that are used to guide communities in their planning process (see section on Sustainability Principles for more detail). The four system conditions are used to help communities recognize their current sustainability challenges and use this understanding to make decisions and plan strategically toward sustainability.<sup>3</sup>

The TNS framework is used to guide communities through a planning process called 'backcasting' that begins with the end in mind. Backcasting is a process of defining what a sustainable future is and then deciding what needs to be done to get there. Key steps in the TNS framework are<sup>4</sup>:

- **Awareness:** A shared language and understanding of sustainability (based on the four system conditions).
- **Baseline:** An assessment of the current sustainability challenges.
- **Compelling Vision:** The creation of community vision and goals that describes what the community will look like if it meets the four system conditions.
- **Down to Action:** Defining key transition strategies and actions to realize the community's goals and vision.



**Figure 2. TNS Planning Process**

Source: Natural Step Canada

<sup>3</sup> The Natural Step Canada, Integrated Community Sustainability Guide, 2009.

<sup>4</sup> The Natural Step Canada, Integrated Community Sustainability Guide, 2009

## Strengths and Weaknesses

**Common Understanding:** One of the key objectives of the TNS Framework is to create a common understanding of sustainability within an organization or community. The four system conditions are used to guide communities to understand their current sustainability challenges and how to overcome them.

**Strong Environmental Sustainability:** TNS's science-based approach to sustainability is focused more on environmental sustainability than social sustainability. Three of the four system conditions are environmental conditions while the fourth is about society. It is challenging to conceptualize how to create sustainable conditions with only one system condition defining what it means to be a sustainable society.

## Applications

TNS Canada has worked with many communities across Canada including the Resort Municipality of Whistler's, the City of Ottawa and the Town of Canmore, Town of Olds, and the City of Airdrie. TNS Canada also developed a guidebook on municipal sustainability planning for the Alberta Urban Municipalities Association (AUMA).



# SUSTAINABILITY PRINCIPLES

Sustainability principles are broad statements that are intended to set the direction for all sustainability planning activities. There are two basic types of principles discussed in this section: those that define at a high level what sustainability is (e.g. The Natural Step Principles), and those that provide a more detailed description of what a sustainable city is along with objectives of a planning processes (e.g. the Melbourne Principles and Smart Growth Principles). Some communities choose to adopt sustainability principles to guide their planning processes, while others do not. The choice is often based on the approach used to develop sustainability plans and the desire to anchor the process with guiding statements.

## The Natural Step Principles

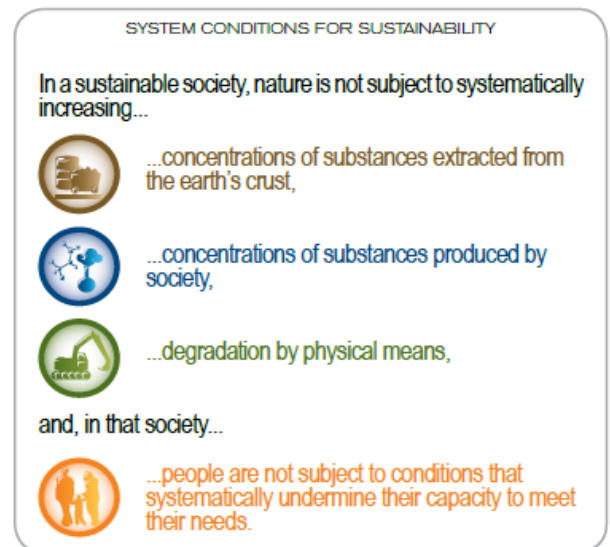
### Concepts

The Natural Step Framework is based on four sustainability principles, also known as 'system conditions for a sustainable society'. These conditions were derived by an international network of scientists.<sup>5</sup> They were developed specifically to assist with backcasting by helping communities define what will be necessary to create a sustainable community.

Backcasting from the sustainability principles suggests that to move toward sustainability we must<sup>6</sup>:

- Reduce and eventually eliminate the extraction of substances from the earth's crust (i.e. fossil fuels, mined minerals, etc...)
- Reduce and eliminate the use chemicals that are persistent and unnatural (i.e. synthetic chemicals).
- Reduce and eliminate our contribution to the ongoing physical degradation of nature (i.e physical encroachment on nature).
- Reduce and eliminate our contribution to conditions that systematically undermine people's ability to meet their basic needs. (i.e. human rights, safe and healthy communities, ability to provide for individuals and families, etc..)

The four principles define the basic criteria for a sustainable society, and are used to evaluate potential goals, strategies and actions when developing a sustainability plan.



**Figure 3. TNS Planning Process**

Source: Natural Step Canada

<sup>5</sup> The Natural Step Canada, Planning for Sustainability – A Starter Guide, 2009.

<sup>6</sup> The Natural Step Canada, Planning for Sustainability – A Starter Guide, 2009.

## Strengths and Weaknesses

**High level Principles:** The principles provide high level guidance for assessing and identifying impacts, issues, strategies and actions. They can also be used in conjunction with other principles that are more process oriented, such as the Melbourne Principles.

**Precise and Scientific Language:** The language of the principles is very precise and scientific due to their academic roots. As a result, they can be difficult to grasp initially and may be met with some skepticism or resistance.

## Applications

TNS Canada has worked with many communities across Canada including the Resort Municipality of Whistler's, the City of Ottawa and the Town of Canmore, Town of Olds, and the City of Airdrie. The principles are also used with organizations and companies in both the private and public sector.

## **Smart Growth Principles**

### Concepts

Smart Growth Principles are used to guide land use decisions towards more sustainable development choices. They promote compact, mixed use development, encourage the provision of a variety of transportation options, advocate for green building and the preservation of open space. The principles also encourage effective community involvement to develop and implement smart growth solutions.

### Smart Growth Principles<sup>7</sup>

1. **Housing Choice:** Create a range of affordable, quality housing choices
2. **Vibrant, Walkable Complete Communities:** Foster development that creates vibrant, unique, walkable complete communities where uses like residential and commercial are mixed to create attractive places to live, work and play.
3. **Smart Building Design:** Encourage building designs that contribute to the context of a pedestrian-oriented neighbourhood and use green building technologies
4. **Renew Existing Communities:** Direct development away from unsettled areas and encourage growth and renewal in existing communities
5. **Green Infrastructure:** Utilize green infrastructure to save money and protect the environment.
6. **Green Space, Farmland and Ecologically Sensitive Areas:** Preserve and enhance green spaces, farmland and environmentally sensitive areas.

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<sup>7</sup> Smart Growth Canada Network – [www.smartgrowth.ca](http://www.smartgrowth.ca)

7. **Broad-Scale, Integrated Planning:** Undertake broad-scale planning for cities and towns in adjacent regions and towns in adjacent regions and towns in a way that integrates land use and transportation planning for the entire region
8. **Transportation Options:** Provide varied transportation options and infrastructure for walking, bicycling, car pooling, car sharing, scooters, public transit and others
9. **Community Involvement:** Encourage effective community involvement early in the process to find unique solutions that fit with the community's vision of itself
10. **Focus on Implementation:** Utilize planning processes, tools and incentives to facilitate private sector investment and ease of navigation in achieving smart growth solutions

### Strengths and Weaknesses

**Land Use Focused:** The Smart Growth Principles are centred on land use planning; social and economic principles are not strongly represented. The principles are useful for guiding the development of alternative design standards and regulations in communities.

**Advocates for a Sustainable Built Environment:** Smart Growth is more of a movement than a planning model. Smart Growth advocates focus on developing and promoting resources for communities to apply the principles.

### Applications

Smart Growth Principles have been widely adopted across Canada. Several communities in British Columbia have incorporated the principles into their community land use plans. Smart Growth Principles have also been applied in the City of Edmonton as part their Smart Choices Development in Edmonton Program.

## Melbourne Principles

### Concepts

The Melbourne Principles were developed by over 40 municipal and civic representatives from around the world through an international charrette held in Melbourne, Australia in 2002. Local governments at the Johannesburg Earth Summit in 2002 endorsed these principles.<sup>8</sup>

The Principles provide a set of statements on how a sustainable city would function and are intended to guide thinking at all levels of planning, management and decision making and provide a strategic framework for action. They were designed to be flexible enough to be adopted by cities around the world. The principles are as follows<sup>9</sup>:

1. **Vision:** Provide a long-term vision for cities based on: intergenerational, social, economic and political equity, and their individuality.
2. **Economy and society:** Achieve long-term economic and social security.
3. **Biodiversity:** Recognize the intrinsic value of biodiversity and natural ecosystems, and protect and restore them.
4. **Ecological footprint:** Enable communities to minimize their ecological footprint.
5. **Model cities on ecosystems:** Build on the characteristics of ecosystems in the development and nurturing of healthy and sustainable cities.
6. **Sense of place:** Recognize and build on the distinctive characteristics of cities, including their human and cultural values, history and natural systems.
7. **Empowerment:** Empower people and foster participation.
8. **Partnerships:** Expand and enable co-operative networks to work towards a common, sustainable future.
9. **Technology:** Promote sustainable production and consumption, through appropriate use of environmentally sound technologies and effective demand management.
10. **Governance and hope:** Enable continual improvement, based on accountability, transparency and good governance.

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<sup>8</sup> Marbek Resource Consultants and Ray Tomalty, Sustainable Community Planning in Canada: Status & Best Practices, 2009.

<sup>9</sup> <http://www.iclei.org/index.php?id=4490>

## Strengths and Weaknesses

**Global Buy-In:** The Melbourne Principles for Sustainable Cities are the only internationally ratified set of sustainability principles for cities. The wide support for the principles makes it easier for communities to adopt them.

**Guiding Principles:** The Melbourne Principles provide guidance on how a sustainable community would function they are not prescriptive but rather can be used to inform various goals, strategies and actions of a sustainability plan.

## Applications

A number of communities across Canada have adopted the Melbourne Principles, including Severn Sound, Rainy River First Nations, and the Niagara Region in Ontario, as well as the Calgary Regional Partnership.

# SUSTAINABILITY MANAGEMENT TOOLS

There are a myriad of management and decision making tools available to support communities through their efforts to become more sustainable. The following describes a variety of tools starting with: 1) tools that are used to monitor and report on organizational activities and 2) tools that are used to assist in decision making.

## ISO 14001

### Concepts

Like private companies, a city or municipality have the potential to impact the environment's air, land, biodiversity, water and people of their community or region. As a result, many cities are committed to managing the array of impacts through an Environmental Management System (EMS). An EMS can be developed to be either registered or in conformance to the International Organization for Standardization (ISO) 14001 EMS standard.

The basis of the EMS framework originates from the Deming philosophy of “**Plan, Do, Check and Act**” and becomes the means with which to identify and manage diverse environmental issues in a systematic way.

There are five basic components or elements of ISO 14001 EMS: a) commitment and policy; b) planning; c) implementation and operation; d) checking and corrective action; and e) management review. The elements are built upon each other with commitment and policy being the base, which supports the entire framework for the EMS.

Typically, cities begin with developing an EMS that focuses on those activities, which it directly influences. This usually includes specific city departments or facilities like a water treatment plant, the solid waste department or it can include the entire administration, products and services of the city.

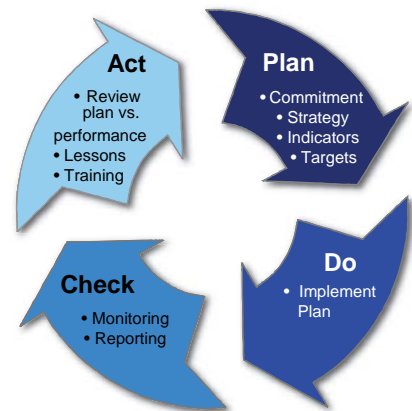


Figure 4. Plan, Do, Check, Act Cycle

### Strengths and Weaknesses

**Systematic Approach to Environmental Management:** Developing and implementing an EMS requires the organization to take a holistic approach to environmental management. The limitation with this however, is that the system is focused on environment aspects, without any interaction/synergy/trade-offs between environment, social and economic concerns. For municipalities in particular, an EMS works best for those matters over which the municipality has direct influence, such as internal operations, and is not well suited for managing environment impacts related to residential and commercial lands, buildings and behaviours.

**Continual Improvement:** Periodic audits are a requirement of the ISO 14001 standard which ensures that the system is functioning and that a framework for continual improvement has been

established. Successful implementation of an EMS requires senior management buy-in and commitment, shared responsibility and understanding of roles, champion possessing knowledge and authority, frequent communication, sufficient resources

**Stakeholder Engagement:** ISO 14001 does not require external stakeholder input or feedback for the development of an EMS.

### Applications

The ISO 14001 standard has been widely adopted across Canada. Enviro is name of the City of Edmonton's environmental management system<sup>10 11</sup>. The Enviro implementation has proceeded in branches deemed to have the highest environmental risks, including but not limited to: roads and design, corporate properties, parks, transit, drainage services and waste management. Other cities that have developed an ISO 14001 EMS include the City of Calgary<sup>12</sup>, City of Saskatoon (in development). In addition, the Halifax Regional Water Commission and other utilities have benefited from developing and implementing EMS.

### Global Reporting Initiative



### Concepts

The Global Reporting Initiative (GRI) is the world's most widely used sustainability reporting framework<sup>13</sup>. Sustainability reporting in the public sector is still in its infancy compared to other sectors (only 1.7%<sup>14</sup> of GRI reports published in 2009 were from public agencies).

The voluntary GRI framework sets out 10 principles classified in 2 categories:

- **Principles for Defining Report Content:** Materiality, Stakeholder inclusiveness, Sustainability context and completeness.

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<sup>10</sup> [http://www.edmonton.ca/environmental/enviro\\_iso14001/enviro-implementation.aspx](http://www.edmonton.ca/environmental/enviro_iso14001/enviro-implementation.aspx)

<sup>11</sup> [http://www.edmonton.ca/environmental/enviro\\_iso14001/enviro-implementation.aspx](http://www.edmonton.ca/environmental/enviro_iso14001/enviro-implementation.aspx)

<sup>12</sup>

[www.calgary.ca/portal/server.pt/gateway/PTARGS\\_0\\_0\\_104\\_0\\_0\\_35/http%3B/content.calgary.ca/CCA/City+Hall/Business+Units/Environmental+Management/Our+Environmental+Management+System/EnviroSystem.htm](http://www.calgary.ca/portal/server.pt/gateway/PTARGS_0_0_104_0_0_35/http%3B/content.calgary.ca/CCA/City+Hall/Business+Units/Environmental+Management/Our+Environmental+Management+System/EnviroSystem.htm)

<sup>13</sup> <http://www.globalreporting.org/Home>

<sup>14</sup> <http://www.globalreporting.org/NR/rdonlyres/13865428-9EAC-4EB0-A8E3-A31AA2F5C38C/3861/GRIReportinginGovernmentAgencies.pdf>

- **Principles for Ensuring Report Quality:** Balance, Comparability, Accuracy, Timeliness, Clarity and Reliability.

There are 79 indicators that organizations can use to measure and report their economic, environmental, social performance, and integrated performance indicators for the purpose of creating a global picture of the firm's sustainability. Some of the indicators are compulsory, others optional, according to their meaning and relevance for the organization. The reporting organization can select from various application levels (A, B or C), to allow for progressive reporting.

### Strengths and Weaknesses

**Assessing Materiality and Indicator Selection:** Some of the main strengths of GRI reporting include the requirement to assess material relevance assessment and the requirement of indicators, data and targets. This is also one of the biggest challenges because of the time required for indicator selection and supporting data collection. The process requires gaining and retaining support, which can be difficult with competing priorities.

**Transparency:** The GRI process is rooted in inclusiveness, transparency, neutrality, and continual enhancement. The benefits of transparency include: improved reputation and brand value, enhance the public value of the company or organization and recruit and retain excellent people.

**Operations Focused:** The GRI can be used by municipalities to report on internal operations. The reporting is not well suited for monitoring and reporting at a community scale.

### Applications

Very few public agencies to date have embraced the form of sustainability reporting represented by the GRI framework. This necessitates that agencies embrace a “corporate” style of reporting, based on indicators that focus primarily on internal or organizational performance<sup>15</sup>.

Municipalities that have based their sustainability programs on GRI include Metro Vancouver<sup>16</sup> and the City of Melbourne<sup>17</sup>.

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<sup>15</sup> <http://www.globalreporting.org/NR/rdonlyres/FAFD9A06-702A-4AA8-988C-979DBCCBC948/0/LeesonEtAlSustReortingByPublicSector.pdf>

<sup>16</sup> <http://www.metrovancouver.org/about/sri/Pages/measuring.aspx>

<sup>17</sup> [http://www.melbourne.vic.gov.au/annualreport/performstat\\_GRI.shtml](http://www.melbourne.vic.gov.au/annualreport/performstat_GRI.shtml)



## Triple Bottom Line Assessment

### Concepts

A Triple Bottom Line (TBL) Assessment provides a framework to ensure that environmental, social and economic impacts are taken into consideration in all aspects of local government service delivery and operation. This approach is a way of implementing sustainability practically and methodically.

TBL is gaining recognition within local government as a means of reporting progress towards or away from sustainability and engaging communities over its implementation. The term Triple Bottom Line was invented by John Elkington in 1980s to highlight the importance of accounting for the non-market and nonfinancial aspects of performance in corporations, including social performance. Triple bottom line is therefore best seen as a process that includes managing, measuring and publicly reporting multi-dimensional performance and integrating with management process.<sup>18</sup>

The development of TBL reporting is inherently tied to the Local Agenda 21 process. TBL and sustainability strategies, however, require comprehensive reporting and assessment of the full range of economic, social and environmental issues, combined with integration of these factors into council operations and strategic planning.

### Strengths and Weaknesses

**Accountability:** Being accountable to stakeholders, employees and the broader community in terms of the implementation of sustainable development is important for local governments. This is relevant to Councils, being focused on the development and maintenance of social stability, economic property and environmental management and protection.

**Transparency:** Disclosing the results of TBL report to the community and generating support through consultation can be powerful forces to progress a Council towards sustainability.

**Integrated planning and management:** For an organization to deliver economic prosperity, environmental quality, and social wellbeing requires these dimensions to be reflected in strategic planning, operational management systems, policy development, and education systems.

**Committed to Stakeholder Engagement:** A core activity of a TBL approach is a commitment to considering stakeholder's perspectives and to developing strategies for engagement is embraced as. However, at the same time complexity can be generated if many assessment criteria and/or stakeholders are involved.

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<sup>18</sup> <http://www.environment.nsw.gov.au/resources/cee/tavisopotts.pdf>

## Applications

In 2001, the International Council for Local Environmental Initiatives (ICLEI) began working with local governments in applying TBL principles to local government and municipal management.<sup>19</sup> ICLEI is an international association of local governments: 476 members in 67 countries.

The City of Hamilton<sup>20</sup> was one of the first Canadian cities to utilize TBL as an assessment and decision-aiding tool that ensures the consideration of sustainability principles in the evaluation of growth options identified in the Growth Related Integrated Development Strategy (GRIDS). The Triple Bottom Line (TBL) Policy was adopted by The City of Calgary<sup>21</sup> which provides a clear, Council-approved statement that The City of Calgary is committed to a “triple bottom line” approach. This means that The City will incorporate sustainable development principles into its decisions and actions.

## Life Cycle Analysis

### Concepts

Life Cycle Assessment (LCA) is a technique for assessing the potential environmental aspects and potential aspects associated with a **product (or service)**, by:

- compiling an inventory of relevant inputs and outputs,
- evaluating the potential environmental impacts associated with those inputs and outputs,
- interpreting the results of the inventory and impact phases in relation to the objectives of the study.<sup>22</sup>



Figure 5. Example of a LCA Diagram: Interface Global

Source: <http://interfaceglobal.com>

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<sup>19</sup> <http://www.iclei.org/index.php?id=6337>

<sup>20</sup> <http://www.hamilton.ca/NR/rdonlyres/F988BA02-9B36-4534-918C-36DC96AF7F9F/0/BrochureTBL.pdf>

<sup>21</sup>

<http://content.calgary.ca/CCA/City+Hall/Business+Units/Environmental+Management/Strategic+Environmental+Initiatives/Triple+Bottom+Line/How+to+apply+TBL.htm>

<sup>22</sup> ISO 14040.2 Draft: Life Cycle Assessment - Principles and Guidelines

The "life-cycle" or "cradle-to-grave" impacts include the extraction of raw materials; the processing, manufacturing, and fabrication of the product; the transportation or distribution of the product to the consumer; the use of the product by the consumer; and the disposal or recovery of the product after its useful life.

In practice, LCAs are mainly used for evaluating:

- Environmental systems comparison;
- Manufacturing (as an improvement lever for the manufacturing phase);
- Commercial development; and
- Municipal infrastructure

### Strengths and Weaknesses

**Impacts of a Product or Service:** LCAs are most effective for addressing the impacts of a product system from raw material acquisition to final disposal and are not generally used for sustainability decision making.

**Timing and Cost:** LCAs can be costly and time-consuming, thus limiting their use as analysis techniques in both the public and private sectors. Streamlined techniques for conducting LCAs are needed to lower the cost and time involved with LCA and to encourage a broader audience to begin using LCA.

### Applications

Municipalities generally use LCA to assess a product or a service. Metro Vancouver evaluated the environment, social and economic impacts of diverting organic material from the solid waste stream. A LCA was conducted to evaluate the potential environmental impacts of several scenarios for organics diversion. In addition, LCA was used to evaluate the baseload electricity generation in Ontario. The Canadian Energy Research Institute (CERI) conducted a LCA of electricity generation from three alternative fuel sources: nuclear, coal and natural gas.

## **EcoBudget**

### Concepts

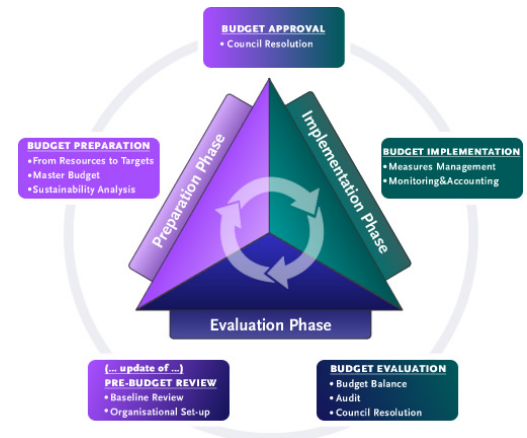
ecoBUDGET (eB) is a system for the management of natural resources and environmental quality by cities. Paralleling the financial budgeting system on a periodic (annual) basis, the system routinely integrates environmental target-setting, monitoring and reporting into municipal planning, decision making and management (ICLEI 2004)<sup>23</sup>.

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<sup>23</sup> [http://www.unep.org/urban\\_environment/PDFs/LiveableCities.pdf](http://www.unep.org/urban_environment/PDFs/LiveableCities.pdf)

Every year a budget for natural resources and environmental quality is developed and approved by the city council. The budget uses physical units, not monetary terms. During the budgetary year, all departments manage their “environmental expenditure”, i.e. the use or pollution of natural resources, within the “spending limits”. After the budgetary year a balance sheet is prepared and performance reported to the council and public.

Once established and becoming an annual routine, similarly to financial budgeting, ecoBUDGET ensures that environmental quality is managed on an ongoing, rational and transparent basis, thus supporting accountability.



**Figure 6. The ecoBudget Cycle**

Source: <http://www.ecobudget.com>

## Strengths and Weaknesses

### **Comprehensive Approach to Local Sustainability:**

Through the ecoBUDGET framework, the state of the environment can be presented to politicians and the public and decisions makers can set priorities for environmental protection. This system requires planning and control of the consumption of environmental goods throughout the budgeting period. One of the challenges associated is that ecoBUDGET involves technical work as well as political decision-making. Its introduction and implementation therefore requires political will and needs to be formally established through a city council decision.<sup>24</sup>

## Applications

The City of Bologna<sup>25</sup> adopted ecoBudget as the core environmental management system for its institutional activities. The first goal was to use ecoBudget as a management and communication instrument within the city's Local Agenda 21 plan. However, Bologna found that there are multiple benefits to using the ecoBudget process. In addition, Guntur, India used ecoBudget to improve their air quality due to traffic congestion at important junctions caused by hawkers selling their wares especially during peak hours<sup>26</sup>.

<sup>24</sup> [http://www.unep.org/urban\\_environment/PDFs/LiveableCities.pdf](http://www.unep.org/urban_environment/PDFs/LiveableCities.pdf)

<sup>25</sup> <http://www.ecobudget.org/?id=7031>

<sup>26</sup> <http://www.ecobudget.org/?id=7029>

## Structured Decision Making

### Concepts

Structured decision making (SDM) is a general term for carefully organized analysis of problems in order to reach decisions that are focused clearly on achieving fundamental objectives. Based in decision theory and risk analysis, SDM encompasses a simple set of concepts and helpful steps, rather than a rigidly-prescribed approach for problem solving.<sup>27</sup>

#### Steps of Structured Decision Making (PrOACT):

Pr	Define the Problem
O	Specify the Objectives and Measures
A	Create Imaginative Alternatives
C	Identify Consequences
T	Clarify the Trade-offs

### Strengths and Weaknesses

#### **Structured and Disciplined Decision Making Process:**

The structured framework helps ensure a full range of factors are considered relating to a decision, in a logical and comprehensive manner. However, it is important to remember that structured decision making can help decide *what needs to be done*, it's often *how things are done* that characterizes effective decision making.

**Stakeholder Involvement:** Limitations of SDM occur when those who should be involved in the process aren't. It is important to ensure adequate participation of stakeholders in the decision making process. In addition, sufficient time is required to generate a range of possible solutions.

### Applications

For more than a decade, BC Hydro has been developing a more structured approach to decision-making, which was recently formalized as Structured Decision-Making (SDM)<sup>28</sup>. The goal is to help staff and the organization overall make better choices by generating options based on multiple (and sometimes competing) objectives and by clarifying tradeoffs, while remaining focused on the triple bottom line.



Figure 7. Steps of SDM

Source:

<http://www.structureddecisionmaking.org/steps.htm>

<sup>27</sup> [http://www.fws.gov/science/doc/structured\\_decision\\_making\\_factsheet.pdf](http://www.fws.gov/science/doc/structured_decision_making_factsheet.pdf)

<sup>28</sup> <http://www.corostrandberg.com/pdfs/Industry-Canada-SDM-Case-Study-Oct15.pdf>

# KEY CONSIDERATIONS FOR SUCCESSFUL SUSTAINABILITY PLANNING

**Clarity is the first step:** There are a variety of approaches that can be used to develop sustainability plans and even more tools that can support the implementation of the plans. Like most things in life, there are no wrong answers or approaches however, it is important to begin with a clear understanding of what the objectives and expectations are of the planning process. This clarity is needed to create a process that meets desired outcomes.

**Follow the Leader:** Leadership is a key driver of sustainability planning. The planning process will fail without a municipal champion(s) who is able to dedicate time and resources. If the planning process is not well supported by management and Council, it will be even less likely for the implementation of the plan to have any traction or support.

**Build Awareness and Understanding:** Sustainability planning takes time and should not be rushed. A successful process is one that is well supported by all the community players. It is important to take the time to build the support of community leaders, municipal staff, stakeholders and the public through awareness raising events. Without all on board it will be less likely to successfully create change in the community.

**Monitor and Adapt:** The right answers are hard to find and are constantly changing. It is therefore important to create a monitoring program that tracks outcomes of actions to determine whether or not goals are being achieved. Monitoring progress makes it possible to determine if actions are having their intended effect. Monitoring also helps to assess the need for change and can inform the future direction of policies and plans.

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