



# THE EIGHT PILLARS OF A SUSTAINABLE COMMUNITY

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## INTRODUCTION

Much has been written and said on “sustainable communities” in the past 15 years. Many projects around the world have taken up the challenge of becoming more sustainable – some driven by the public sector and others by private developers. When these examples are examined closely, they typically show some similarities but more differences. These differences are largely due to the unique conditions of the project – physically, financially, politically and otherwise.

The concept of “sustainable development” emerged from the United Nations Brundtland Report in the late 1980s, in recognition that we need to create prosperous economies and communities, but we cannot damage the planet while we do this, because our children need the same opportunities we have had.

The core sustainability issues that emerged from this report include climate change, energy security, water and wastewater management, solid waste management, environmental protection, food security, health, safety, economic opportunity and responsible business practices.



## APPLYING SUSTAINABILITY TO A COMMUNITY

There are many aspects to any community and in order for a community to make real progress on sustainability objectives, the issues of sustainability must be considered for every aspect of a community. As is immediately evident, this approach yields a matrix where one axis has sustainability issues on it, and the other has community aspects.

Our firm calls this the Sustainability Matrix® and on it we include the following:

### SUSTAINABILITY ISSUES OF THE MATRIX

#### STABLE AND DIVERSE LOCAL AND GLOBAL ECONOMIES

Sustainability recognizes the need for economic prosperity and resilience to maintain the health of the community, and notes that this involves both healthy local and global economic relationships. It encourages self-reliance, entrepreneurial activity and the generation of wealth and highlights the need for economic activity to occur in a manner that does not undermine the ability of individuals and communities anywhere to meet their basic needs.

#### SOCIAL AND COMMUNITY HEALTH.

At a local level, sustainability objectives highlight the need to provide a strong foundation for the economy by ensuring the provision of safe communities, healthy housing, employment, education, arts and culture, adequate access to health care and social support systems when needed, and a respect for other cultures, amongst other issues. Personal health issues including diet, exercise and other lifestyle choices are also important considerations with many economic linkages. At a larger scale, sustainability



## CLIMATE CHANGE AND AIR EMISSIONS

objectives also highlight the linkage the industrialized world has with the un/newly industrialized world and encourages ethical trade relationships that can be sustained and support the sustainability of the supply communities.

Sustainability objectives highlight the need to reduce negative air emissions associated with economic activity to reduce impacts and avoid economic costs of mitigation of health and climate change impacts. Most emissions are associated with the use or wastage of energy in one form or another.

## ENERGY SUPPLY

Sustainability objectives highlight the need to use energy more efficiently and to shift over time away from reliance on non-renewable sources in favour of more renewable sources, to reduce emissions, increase energy security and insulate the economy from energy price shocks associated with real or perceived energy constraints.

## WATER AND LIQUID WASTE

Sustainability objectives suggest the need to use water more efficiently in our homes, businesses and landscapes, to manage runoff in ways that maintain natural hydrological regimes and to manage liquid waste flows to minimize both the environmental and economic costs of pollution and infrastructure.

## RESOURCES AND SOLID WASTE

Sustainability objectives highlight the need to increase economic efficiency and performance by reducing the consumption of non-renewable scarce resources in favour of renewable resources, to reduce environmental and economic impacts of hazardous wastes and to essentially eliminate the concept of waste, in favour of principles of efficiency, re-use and recycling.

## ECOSYSTEM DISRUPTION

Sustainability objectives highlight the need to address ecosystem planning and biodiversity in our projects by protecting ecologically sensitive areas / species and by developing areas in a way that minimizes negative impact. Sustainability approaches often are more 'multiple objectives' in this area than conventional "environmentalist" agendas which can often oppose any economic activity.

## FOOD SUPPLY

Sustainability objectives highlight the need to maintain a healthy local food economy and supply, as well as to encourage food production and processing methods that enhance health, such as organic methods.



## COMMUNITY ASPECTS OF THE MATRIX

When planning a community, there are many considerations, and each community is unique. However, some items are often considered to be the core aspects of any community. They include:

- ***Land use, density and layout***
- ***Transportation (all aspects)***
- ***Buildings***
- ***Landscape and open space***
- ***Infrastructure***
  - » ***Energy infrastructure***
  - » ***Water infrastructure***
  - » ***Solid waste infrastructure***
- ***Food***
- ***Community process, facilities and programs***
- ***Economic investment, jobs and businesses***



## THE SUSTAINABILITY MATRIX<sup>®</sup> FOR (MORE) SUSTAINABLE COMMUNITIES:

Sustainable Communities Matrix	Energy & Emissions	Water, Stormwater & Liquid Waste	Resources & Solid Waste	Ecosystem integrity	Food	Individual & Community Health	Economic Vitality & Stability
Land Use & Site Layout							
Transportation, Parking & Streets							
Buildings							
Open Space / Landscape							
Infrastructure (energy, water, waste, integrated)							
Community facilities & programs							
Economic & commercial opportunity							

Any community pursuing sustainability can identify what sustainability “really means to them” by filling in each cell on this matrix as best as they can, with issues and Best Management Practices (BMPs). Where certain suggestions repeat themselves often, these should be considered the highest priority, as by pursuing them, many sustainability objectives will be met simultaneously.

Our firm has worked with this Matrix tool for many years and we are seeing a range of patterns emerging. We have clustered these and now call them, “The Eight Pillars of a Sustainable Community.” They are described starting on the next page.



### **PILLAR #1) – A COMPLETE COMMUNITY - LAND USE, DENSITY & SITE LAYOUT**

A sustainable community needs to be a complete, vibrant, mixed use community that offers its residents the opportunity to work, live, play, shop, learn and pray within a convenient walking or transit distance. The community should be structured to protect key riparian areas and other important natural features stable while respecting the challenges of developing on any particular site. The community should offer a diversity of housing for a range of incomes, family sizes and ages. Commercial areas should offer office, retail, commercial space, in addition to residential and community amenities. For new communities, the issue of providing land use structures that can offer “real jobs” (not just retail) is critical for the long term prosperity of the community. The landscape in the community also needs to offer a wide range of recreational opportunities to provide a great quality of life to residents and visitors.

### **PILLAR #2) – AN ENVIRONMENTALLY-FRIENDLY AND COMMUNITY-ORIENTED TRANSPORTATION SYSTEM**

A sustainable community should prioritize pedestrian and cyclist modes of mobility and provide as many alternatives to the automobile as possible, including planning in advance for convenient transit service, and providing shared cars / auto co-ops to reduce the need for single person auto use. Parking strategies should minimize negative landscape disruption wherever possible (underground or ecologically sensitive design). A fine-grained pedestrian / cyclist path network should link all areas to each other to permit pedestrians to move in as straight a line as possible to their destinations.

The streets in a sustainable community should be designed with multiple objectives in mind, unlike conventional streets which are designed solely for moving and storing cars. More sustainable streets support vehicle movement and parking, but offer many other things as well as to contribute to environmental and social values, such as stormwater management, trees, bird habitat, play ground areas and other community uses. The Dutch woonerf (“play street”) is a good example of this approach.

### **PILLAR #3) – GREEN BUILDINGS**

A sustainable community should be populated by green buildings. Buildings stand for 50-100 years or more and their design greatly determines the impact their occupants have on the planet as they live their daily lives. A green building strategy needs to be created for each community that establishes a logical approach to promoting green buildings including addressing issues such as:

- » Energy efficiency;
- » Renewable, clean and highly efficiency energy supply (such as geexchange);
- » Passive solar oriented design;
- » The Eight Pillars of a Sustainable Community
- » Indoor air quality;
- » Green roofs;
- » Water efficient fixtures; and
- » Many others.





Green buildings can be promoted either through green design guidelines which set a standard everyone must meet. These are easy to introduce into regulation but few will exceed their minimum standards. In alternative, green buildings can be promoted through green building rating systems which promote flexibility in choice of many things one can do to make a building greener. This approach has been popularized widely in the USGBC/CaGBC's LEED system. A rating system stimulates competition to do better, but is very difficult to regulate.

#### **PILLAR #4) – MULTI-TASKED OPEN SPACE**

A sustainable community should offer a wide range of opportunities in its open space design, to accommodate both community and ecological needs. Key environmental areas such as riparian corridors, important natural features, groves, and forested areas should be protected where possible, although impact will occur and possibly the more important question is how the disturbed ecosystem will be rehabilitated through ecological design after development. This is because forests force many trade-offs with human habitat. Beyond protection of critically sensitive areas, the landscape should be designed with ecological enhancement in mind, including enhancing the habitat for songbirds and butterflies through using native plants and native-compatible plants. Landscape design should also minimize or eliminate the need for irrigation and the use of pesticides.

Food should be celebrated in the landscape, particularly through the provision of community garden space where appropriate in multi-family areas to provide an opportunity for residents to grow food and meet each other.

Health, social networks and fun in the community should be enhanced through the provision of active and passive recreation opportunities throughout the neighbourhood. Great efforts should be undertaken to provide as many facilities and opportunities for all imaginable outdoor activities in the centre of the community. These animate the public realm, greatly increase health and quality of life, and can significantly reduce transportation impacts from people leaving the community to play. It is also important to recognize that in an increasingly diverse population, good landscape programming involves adding new facilities and activities over time, as the desires and activities driven by the market continue to change.

#### **PILLAR #5) – GREEN INFRASTRUCTURE**

A sustainable community should pursue innovative and green infrastructure wherever it can. "Green" infrastructure strategies should be created for every sustainable community to address sustainability objectives in the supply and management of energy, water, waste water, materials, solid waste, and others.

- **A Community Energy and Emissions Strategy** – A sustainable community should develop an energy and emissions strategy to look at ways to increase energy efficiency, reduce emissions and support local, clean and renewable energy sources.
- **A Water and Waste Water Management Strategy** – A sustainable community should develop an innovative water and waste water management strategy to consider the water supply and treatment management systems with an eye to reducing demand for potable



water, finding benign treatment systems, recycling and reusing treated water where possible to reduce potable water demand, and others.

- **A Stormwater Management Strategy** – A sustainable community should develop a coordinated stormwater management strategy that addresses issues such as street design to minimize runoff, emergency flood management, stormwater retention and re-use, stormwater quality management through swales and natural treatment systems, the integration of stormwater runoff into artistic characteristics or public art in the neighbourhood, and other issues.
- **A Solid Waste Management Strategy** – A sustainable community should develop an innovative solid waste management strategy to ensure it diverts as much waste from the landfill as possible, and turns wastes into resources where possible. Waste is really a verb rather than a noun. Issues to consider in such a strategy may include construction waste management, design to accommodate recycling and organic compost diversion (three stream separation) both at the scale of the unit (e.g.: kitchen design) and at the building (e.g.: garbage room design) in multi-family buildings, the provision of “share shelves” in the garbage rooms of each multi-family building to encourage the sharing amongst residents of items that have a lot of useful life left in them, site clearing waste management, such as composting wood waste, making bark mulch, re-use of clearing wood by local artists , or others, plant salvage from construction areas for reuse as landscaping vegetation, and others.
- **An integrated system strategy: Eco-Industrial Networking** – A sustainable community explores opportunities to integrate their infrastructure systems to increase their efficiencies, but also to increase environmental performance. For instance, often significant heat can be drawn from a sewage pumping station flows – enough to heat hundreds of nearby homes. Parking and transportation facilities can often be shared amongst land uses or businesses to reduce impact and cost. The practice of designing these integrated systems is known as Industrial Ecology and its practice is known as Eco-Industrial Networking. The term “industrial” is merely a reference to where the practice emerged – in industrial and chemical plants where models of the “ecosystem” are now being used as templates from plants and industrial parks.



## PILLAR #6) – A HEALTHY FOOD SYSTEM

A sustainable community should recognize both the importance of a healthy food supply for the community, but also the great opportunities for culture and community spirit that food can offer. Food is like any other flow in a community such as energy, water or materials. Moreover, it is a major element of every household’s expenditures and the food supply has a significant impact on the planet. The community should encourage the development of a food store and restaurants within convenient distances of all residents to reduce driving, increase local economic activity and increase the quality of life. Village areas should be designed to support a farmer’s market, including the provision of necessary infrastructure such as power, water and washrooms. Community garden space should be provided where possible in multi-family areas to permit the growing of



some food. Celebration of food throughout the season will be encouraged, such as through the establishment of an apple festival or other events, in a partnership with the local homeowners or business owners associations. Organic food supplies should be encouraged as they not only taste better and are healthier, but they also significantly reduce the impact on the planet of producing food.

### **PILLAR #7) – COMMUNITY FACILITIES AND PROGRAMS**

A sustainable community should provide key community facilities to support a healthy lifestyle and the creation of a vibrant social community including a high quality public realm design that promotes safety and encourages residents to meet each other and build relationships. These facilities and programs vary for each community and a strategy to provide amenities and facilities for all age groups needs to be developed to support a good quality of life for people of all ages and to support “Aging in Place” opportunities.

### **PILLAR #8) – ECONOMIC DEVELOPMENT**

A sustainable community should offer many economic opportunities for investment, businesses and employment that can support an economically diverse and prosperous community. Commercial and village areas should offer a range of commercial (retail and local office) facilities to maximize working and shopping opportunities. The commercial areas should not only focus on retail jobs, but also on encouraging the development of real job opportunities appropriate to the income level of the neighbourhood, including live/work opportunities. The pursuit of greener buildings in a commercial area may also reduce energy and other costs for its businesses making the village a desirable and competitive place to locate. Greener buildings also have marked increases in employee satisfaction which also supports prosperous businesses. Opportunities to leverage a community’s natural locations adjacent natural or recreational areas or as part of a rich history of past activity needs to be identified and leveraged. Finally, a sustainable community works to encourage the adoption of green business practices and other systems that enhance both the environmental and economic performance of businesses in the community.

### **THE FOUNDATION**

Finally, underpinning all the above pillars is a foundation – the foundation of effective management systems and resources. Little can be achieved in any project or community around the eight pillars unless a person or team is tasked with the responsibility of making it happen and are given the resources and empowered to make it happen. The management systems include the people, their expertise, policies, protocols, a paper trail of accountability, tools to assist in taking action and a full network of participants. This institutional dimension can be seen as the “seat” of the three legged stool of sustainability(economic, social, environmental legs) – without a strong “seat,” we don’t have a piece of useful furniture. Interestingly, this institutional dimension is increasingly becoming the front line of sustainable development work as many of the best practices for each pillar are being worked out and becoming more mainstream in leading communities.



## CONCLUSION

The Eight Pillars of a Sustainable Community is offered as a summary of the many opportunities a community can pursue to become more sustainable. By pursuing these, a community will not only increase its livability and prosperity, it will reduce the ecological footprint of its residents and increase human and ecological health, both locally and globally.

Each community is unique and not all the BMPs noted above will be appropriate. Through using the Sustainability Matrix, a community can build a personalized “hand-in-glove” sustainability strategy, tailored to their specific needs, challenges and opportunities.