

VISION MANDATE:

A healthy and resilient environment is a “core need” integral to the livability of Richmond and contributes to:

- **“Build Community”:** Support community safety and well-being by developing a healthy and nourishing environment, strengthening resiliency to change and supporting environmentally sustainable lifestyle choices;
- **“Build Green”:** Provide adequate space for high functioning ecological servicing and support the wise use of natural resources;
- **“Build Economic Vitality”:** Preserve and develop natural capital, attract progressive businesses and visitors, reduce demand on infrastructure and minimize the economic impacts from changing environmental conditions;
- **“Build a Legacy”:** Develop a strong and resilient ecological base and long-term adaptability strategies.

“A City may be sustained by ecosystem services derived from an area up to 100x larger than itself”.

Millennium Ecosystem Assessment

The City has established “sustainability” as a corporate priority. As well, it has established a Sustainability Office to lead the City in establishing policies to address the many complex issues. These issues include improved eco-regeneration, connectivity, improved ecological services and functions, Eco-Plus+, LEED, a triple bottom line, a multi-objective development approach and adapting to climate change. Until more detailed policies are established, the City, developers and community stakeholders are encouraged to address these issues voluntarily and innovatively.

2.5 Ecology & Adaptability

ISSUE:

Richmond’s location - at the point where the Fraser River meets the Pacific Ocean - means that the island City is located within some of the most productive ecosystems in the world.

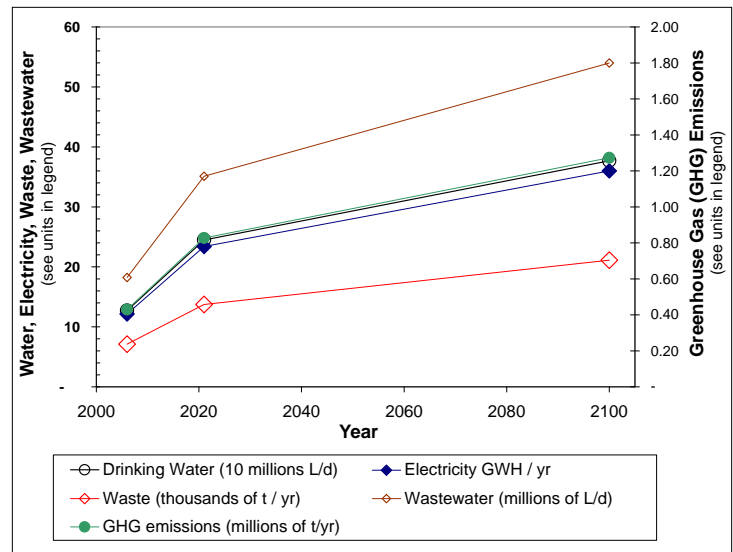
The Richmond community depends upon its local ecosystem and broader environment to provide its daily socio-economic needs – growing food, supplying water and clean air, providing material resources.

Increasing growth will place higher demands on already stretched ecological resources. Research about ecological sustainability indicates that the worldwide use of resources is exceeding the Earth’s capacity to renew and replenish them.

“If everyone lived like an average Canadian, we would need 4 Earths to support current lifestyles.”

At the same time, awareness is increasing that communities are likely to experience significant impacts from changing environmental conditions. Key concerns exist regarding the impacts of greenhouse gas emissions – the main contributor of climate change and the reduced availability of current core dependencies (e.g., fossil fuels, food supply).

Business As Usual Consumption Trends



The CCAP and other City initiatives aim to replace resource demands and address these issues.

OBJECTIVE:

Provide a framework for an “**eco-regenerative urban community**” that supports a cleaner, greener and healthier downtown and its ability to adapt to changing environmental conditions.

Strategy

The compact, transit- and pedestrian-oriented, urban form, outlined in this Plan, aspire to reduce pressure on natural resources and reduce per capita waste emissions. A compact urban form is a beginning and more can be done.

Accordingly, a new model of the urban environment is encouraged - one that aims to regenerate Richmond's ecological health rather than solely reduce impacts.

The four strategies: **Living Landscape, Greening the Built Environment, Adapting to Change** and **Greening the Community** aim to advance environmental sustainability.

Given the issue complexity, policies will be developed and strengthened over time to incorporate new knowledge and advancements in best practices.

Proposed CCAP Compact Urban Form

- Directs growth away from natural and agricultural lands.
- Reduces automobile dependency (e.g., through mixed-use development, densification near major transit, increase alternative transportation choice.).
- Maximizes the use of existing infrastructure and reduces the demand for new services.



PLUS

Example Eco-Regenerative Features

Over time, explore how to provide:

- high performing ecological services integrated throughout the City Centre;
- green building practices;
- strengthen community resiliency to climate and other environmental change;
- eco-amenities which increase green living practices.



*Example of integration of eco-regenerating features.
Credit: Lennart Johansson, Info-Bild, Stockholm.*

POLICIES	
2.5.1 Living Landscape	
a)	<p>Ensure an Adequate Long-Term Supply of Interconnected Ecological Service Areas</p> <ul style="list-style-type: none"> • All private development and City works will comply with the City's Environmentally Sensitive Areas (ESA) policies, the City's Riparian Areas Regulation (RAR) Response Strategy, the City's Tree Protection Bylaw and the Fraser River Estuary Management Program (FREMP) project review process and all other applicable environmental legislation. • Development applications will be encouraged to develop landscape plans which improve ecological functioning and support greenway development. • All City projects will aim to improve the ecological functioning of the landscape and support greenway development. • Priority will be placed on the protection and enhancement of the Fraser River foreshore (e.g., a 30 m averaging setback buffer in accordance with the City's ESA development permit process). • The City will review best practices and assess the merit of establishing a base ecological green space benchmark.
2.5.2 Greening the Built Environment	
a)	<p>Reduce per Capita Resource Demands & Strengthen Ecological Base</p> <ul style="list-style-type: none"> • Optimize the use of existing infrastructure through compact land use and transit-oriented development policies. • Private developments: <ul style="list-style-type: none"> - LEED Silver will be required for all rezonings of private developments over 2,000 m² received after January 1, 2009; - the LEED Heat Island Effect: Roof Credit will be required for all rezonings of private developments over 2,000 m² received after January 1, 2009 involving non-residential buildings (e.g., commercial and industrial) and multiple-family residential buildings greater than 4 storeys excluding parking (e.g., concrete high-rises); - the LEED Storm Water Management Credit will be required for all rezonings of private developments over 2,000 m² received after January 1, 2009 involving non-residential buildings (e.g., commercial and industrial) and multiple-family residential buildings excluding parking (e.g., concrete high-rises, wood frame apartments and townhouses). • City of Richmond development: <ul style="list-style-type: none"> - city facilities will be developed and operated in accordance with the City's High Performance Building policy; - demand-side management and an Eco-Plus+ (see below) approach will be adopted for all City servicing (e.g., park management, transportation planning, engineering servicing.).
b)	<p>Reduce Greenhouse Gas Emissions</p> <ul style="list-style-type: none"> • Transportation need and automobile reliance will be reduced through compact land use and transit-orientated development practices. • Corporate and community-wide greenhouse gas emissions reduction targets and strategies will be developed and emissions monitored and reported (e.g., via the City's State of Environment Program). • Economic policies which support the transition to a low carbon economy will be explored.
2.5.3 Adapting to Change	
a)	<p>Pursue a Multi-Objective Approach for all City Policies & Projects</p> <p>Encourage a multi-objective approach (e.g., recreation, access and ground water recharge on a site) to implementing the CCAP to optimize the benefits for the community and minimize unintended impacts.</p>
b)	<p>Adhere to a Process of Continual Improvement & Adaptive Management</p> <p>Improve CCAP environmental sustainability policies through adaptive management (e.g., explore environmental performance objectives, targets and monitoring).</p>
c)	<p>Strengthen Community Resiliency to Changing Resource Supplies</p> <p>Explore opportunities to increase local resource self reliance and long-term security (e.g., food security, energy security, groundwater security, intertidal ecological security).</p>
d)	<p>Strengthen Community Resiliency to Climate Change</p> <p>Explore adaptation strategies to ensure adequate climate change risk management and the optimization of investment opportunities. These will include, but not be limited to:</p> <ul style="list-style-type: none"> • reviewing land use development patterns, infrastructure standards and flood management policies, and approaches to incorporate evolving knowledge and practices for adapting to climate change; • addressing climate change.
2.5.4 Greening Community Living	
a)	<p>Within each Village area, encourage ecological-based amenities (e.g., groundwater recharge, gardens, trees) to facilitate environmental sustainable living.</p>

2.5.1 Living Landscape

“Build a City Centre landscape that supports essential ecosystem services over the long-term”.

Conventional environmental management aims to protect and reduce development impacts on specific natural features rather than the overall ecological system. Management using this model may fragment and erode ecological systems without improving the fabric of the ecology or protecting the suite of essential **ecosystem services**.

Opportunity

Imagine an integrated environmental approach:

- where ecological systems are valued as natural capital for the services they provide;
- where ecological networks of all types (e.g., natural, semi-natural, engineered) and sizes are weaved through urban landscapes;
- where ecological areas are protected and connected together by ribbons and threads of green;
- where local ecological systems serve multiple objectives (e.g., recreation, access and ground water recharge on a site), reducing long-term infrastructure costs and enhancing urban environments.

Proposed Strategy

Set the direction to move from fragmented protection and impact minimization to **improved ecological function** by incrementally developing a **living landscape**.

Ecosystem Services

Everyday, local communities rely on the essential life-supporting or **Ecosystem Services** of the Earth’s natural systems (Millennium Ecosystem Assessment). These include basic survival services such as food and water; natural process services such as flood control and waste assimilation; and the provision of natural resources that build the economy.

The provision of these services is dependent upon the functioning of the ecological system. This system works to support many activities - recycle nutrients, produce oxygen, regulate the atmosphere, produce and degrade matter. The healthier the ecological system is, the more services it can provide and the healthier the living environments will be.

Improved Ecological Function

In an urban landscape, areas can be developed to support the local ecological system by integrating ecosystem services areas within a compact and complete community development framework. A **living landscape** can be developed in a wide range of ways and depending on the various features incorporated, result in a suite of socio-ecological benefits.

Ecosystem Service Benefit Examples:

- *wetlands in the Lower Fraser Valley provide at least \$230 million worth of waste-cleansing services each year;*
- *studies across North America and in B.C. have shown that proximity to natural green space increases the value of residential property by 15 to 30%.*

Green Bylaws Toolkit

Living Landscape Model An Aid to Improved Ecological Function	
Potential Characteristics	Potential Co-Benefits
<ul style="list-style-type: none"> • Many ecosystem services are provided within the urban area. • Ecological service areas are connected together. • High ecological functioning features (e.g., clumping of multi-layered vegetation, groundwater recharge areas). • On-site resource production. 	<ul style="list-style-type: none"> • Community beautification. • Enhanced recreation. • Alternative transportation corridors. • Reduced infrastructure servicing needs. • Strengthened economic development (e.g., attractive environments, increasing local resource autonomy).

Living Landscape On-The-Ground

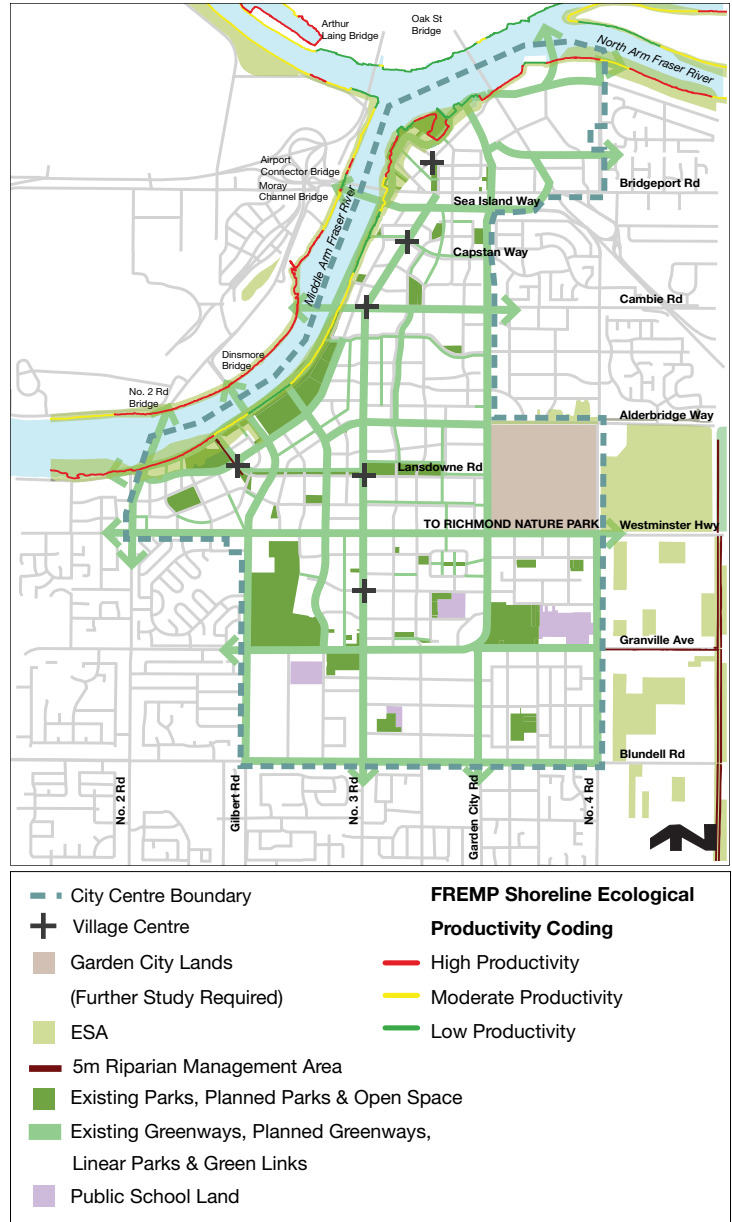
Example features that can be pieced together incrementally to build a living landscape include:

- dykes along the Fraser foreshore built to enhance ecological features;
- greenways that meet multiple objectives (e.g. connect natural areas, provide recreation and alternative transportation options, perform infrastructure services);
- boulevards that feature multi-layered habitats;
- parks and school grounds with enhanced ecological areas.



A Base for Building a Living Landscape Map

Purpose: This map demonstrates some of the City’s current and possible ecological and open space resources upon which an interconnected ecological network can be based.



2.5.2 Greening the Built Environment

“Build developments and infrastructure in such a way that use natural resources wisely and regenerate ecological productivity.”

Opportunity

Buildings and associated infrastructure represent significant investments in terms of both financial and natural resources.

Imagine buildings and infrastructure which rather than simply consuming natural resources, contribute to ecological productivity and financial sustainability by:

- using **resources wisely** (e.g., reduce overall use, minimize waste, use renewables);
- **generating resources and ecological services** on-site (e.g., using on-site energy and water supplies, supporting urban gardens);
- **support environmentally sustainable lifestyles** (e.g., providing daylight to reduce lighting needs).

Proposed Strategy

To:

- encourage an **“Eco-Plus+”** approach aimed at maximizing environmental returns during development;
- require adherence to **High Performance building standards** for all City facilities and larger developments.



Richmond's City Hall, built in 2000, is a high-performance building that uses natural light to reduce energy use.

About Eco-Plus+

Conventional approaches to development aim to reduce adverse impacts to the environment. An **Eco-Plus+** approach integrates environmental improvements as part of the development process, rather than just managing impacts. Potential examples include:

- the enhancement of intertidal habitat during dyke construction works;
- designing and building buildings which generate on-site resources (e.g., solar energy) and provide shading;
- providing innovative technologies in a transparent manner for increased learning (e.g., pilot, showcase and demonstration projects).

High Performance Building Standards - About LEED

The Leadership in Energy and Environmental Design (LEED) rating system was developed by the US Green Building Council as a means to evaluate the degree to which buildings meet high performance standards. Buildings are evaluated based on factors pertaining to site selection, water and energy efficiency, material use and indoor air quality. To achieve a specific level of certification, buildings must meet certain requirements (prerequisites) and gain a certain number of credits.

The City has already adopted a Sustainable High Performance Building Policy that specifies LEED Gold for City-owned facilities. The CCAP includes policies to require LEED Silver on private development rezoning applications. It also requires that the LEED Heat Island Effect Roof Credit and LEED Storm Water Management Credit be met in order to encourage green roofs and to address storm drainage, site permeability and urban heat island effect issues in the City Centre.

2.5.3 Adapting to Change

“Build a community that is adaptable and resilient to impacts from climate change and other changing conditions.”

Decisions made today influence the present and future resiliency of communities. With a number of changes projected to occur in the future, adaptation planning that increases community capacity to manage with change - is becoming increasingly important.

Challenge

Communities are facing a number of changes in the future due to changing environmental conditions. For example, most communities are largely dependent upon the use of non-renewable resources which are diminishing in supply. Concurrently, increasing atmospheric greenhouse gases are resulting in climatic change. Rising temperatures, changes in precipitation patterns, shifts in seasons, and rising seas are some of the expected manifestations of climate change.

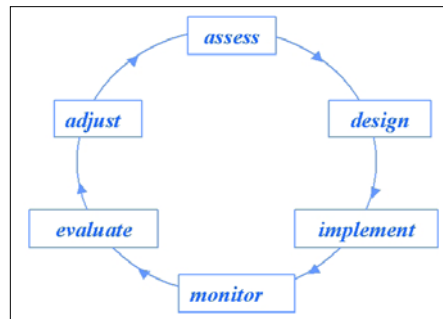
Proposed Strategy

In order to best position Richmond to address future changes, the City will follow an adaptive management approach (e.g., develop, monitor, improve).

About Adaptive Management

Climate change and resource security issues are relatively new challenges for local communities. As a result, while awareness exists that future changes are likely, limited information exists on what these changes specifically mean for local communities and how they can best adapt. Adaptive management is a systematic process of learning to continually improve management policies and practices over time. Recognizing the dynamic conditions of natural and social systems, this approach enables the City to continually strengthen policies based on assessments of local performance, outcomes of action taken and evolving best practices.

An Adaptive Management Model



2.5.4 Greening the Community

“Build community amenities that foster environmental sustainable living.”

An **Eco-Amenity** is a community resource that facilitates environmentally responsible living while contributing to community place making and pride.

Opportunity

A variety of amenities are already provided throughout the community in support of environmental sustainable lifestyles (e.g., recycling depot, community gardens, greenways, cycling network, educational workshops).

The opportunity exists to systematically plan and implement anchor amenities of a type and scale to significantly facilitate green living and contribute to the identity of each village area within City Centre.

Proposed Strategy

Continue to explore eco-amenity opportunities. Have one eco-amenity per Village (e.g., community gardens, parks which manage rain water).

The achievement of an eco-amenity could be through a variety of options (e.g., private, public, private/public partnership).

Eco Amenity Examples

Green infrastructure installations (e.g. a community park that manages rain water, enhances habitat, contributes to local recreation and enhances community feature).



Garden City Park, Richmond.

Opportunities for the community to connect with agricultural experiences (e.g. support local farmers, community gardens).



Farmer's market produce.

Amenities that showcase environmental innovation, produce resources locally, support learning, etc.

(e.g., local renewable energy facilities, eco-business precinct areas, sustainable learning centres, natural areas, art that incorporates sustainability education).



Centre for Urban Ecology, Humber College, Toronto, is designed to integrate with the surrounding ecosystem and result in minimal environmental impact.