TORONTO WATERFRONT
REVITALIZATION CORPORATION

July 27, 2005

Message from the President and CEO:

The Toronto Waterfront Revitalization Corporation is committed to making the city's waterfront both a national and global model for sustainability. What we do on the waterfront can and will set new standards for best practices not only in Canada but throughout the world.

We want sustainable development to define us *and* to be the key measure against which we are judged.

This Sustainability Framework is the roadmap that will guide the transformation of the waterfront into new, vibrant downtown neighbourhoods. Its goal is clear: to ensure that sustainability principles are integrated into all facets of waterfront management, operations and decision-making.

The sustainability benefits afforded by waterfront revitalization are numerous and include:

- Remediating brownfields and developing new communities in the city
- Reducing the need to develop agricultural and environmentally sensitive land outside the city
- Increasing the supply of affordable housing
- Reducing air pollution associated with commuting
- Reusing or improving existing infrastructure
- Requiring the development of high efficiency, green buildings
- Making public transit, cycling and walking the primary modes of transportation
- Increasing opportunities for economic development
- Increasing the amount of parks and other public spaces
- Increasing cultural vibrancy and beautiful public spaces

Our framework promotes many of the sustainability policies supported by the Government of Canada, the Province of Ontario and the City of Toronto. We will work with the three levels of government, members of the community and the private sector to make sure that we capitalize on all opportunities and utilize the best practices and technologies that the world has to offer.

Achieving sustainability on Toronto's waterfront will require commitment, determination and most importantly, coordination. A truly sustainable community cannot be created piecemeal. The multifaceted nature of sustainable development demands an integrated approach. With the mandate to oversee and lead waterfront renewal, the Toronto Waterfront Revitalization Corporation is uniquely positioned to make this happen.

The TWRC understands that sustainability leadership is an ever-evolving task. The Sustainability Framework lays out our current commitments, action and targets but the framework will be reviewed and updated periodically to reflect innovations in sustainable community development.

We are grateful to all our partners and stakeholders and the members of the public who took the time to review and comment on earlier versions of the framework and participate in our community consultations. Their input helped us improve our initial drafts by linking best practice from around the world to real world conditions and priorities along the waterfront.

John W. Campbell
President and CEO

Sustainability Framework

OF NOTE: THE TORONTO WATERFRONT REVITALIZATION CORPORATION'S (TWRC) SUSTAINABILITY POLICY IS OUTLINED IN THE ACTIONS, STRATEGIES, OBJECTIVES, TARGETS PRESENTED IN THIS DOCUMENT.

HOWEVER, TO BE RESPONSIVE TO CHANGING ECONOMIC, SOCIAL, ENVIRONMENTAL AND CULTURAL CONDITIONS AS WELL AS TECHNOLOGICAL AND SCIENTIFIC BREAKTHROUGHS, THE TWRC'S SUSTAINABILITY FRAMEWORK WILL BE REVISED FROM TIME-TO-TIME.

Terms

On-site -The area defined as the Toronto Waterfront within the Toronto Waterfront Revitalization Corporation's mandate.

Sustainability Showcase – Examples of initiatives that showcase sustainability principles in action. All showcase items demonstrate longevity, innovation and multiple benefits including economic, environmental and social ones.

NET PLUS™ – NET PLUS is a term coined by the TWRC to express the idea that revitalization will provide sustainability benefits in a way that has an overall positive net impact on-site and to the city as a whole.

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Toronto's Waterfront: The 21st Century Starts Here

"Sustainability is the new imperative for cities in the 21st Century and the Toronto waterfront will be distinguished by its leadership on sustainability. The question is not if we will do it but how we will do it"

Robert A. Fung, Chairman, Toronto Waterfront Revitalization Corporation (TWRC)

Introduction

Sustainable development is a challenge and a promise

Sustainable development is a challenge and a promise. The challenge is to be creative and dynamic, to include a broad range of views in decision making, and to steer clear of trade-offs like economic progress that harms the environment or cleaning up the environment at the expense of community well-being. The promise is that we can build successful communities that combine long-term viability with the interlinked goals of economic, environmental, and social gains.

The Toronto waterfront will be defined by its leadership on sustainability as laid out in the TWRC's Development Plan and Business Strategy and Annual Report (see Box 1). Impacts of national, provincial, and local policy and regulations can create barriers or reinforce sustainability aims. Fortunately, sustainable community development is also central to the objectives of Toronto's new Official Plan, Ontario's Smart Growth initiative and the federal government's Sustainable Development Strategies.

This Sustainability Framework translates general commitments to sustainability into a clear vision, concrete goals, actions and targets. The goal of the Sustainability Framework is clear: to ensure that sustainability principles are integrated into all facets of TWRC management, operations and decision-making as we set out to create vibrant sustainable communities on the Toronto waterfront.

Box 1:TWRC Corporate Mission, Vision and Objectives[1]

TWRC Corporate Mission

To put Canada at the forefront of global cities in the 21st Century by transforming the waterfront into beautiful, accessible new communities, parks and public spaces, fostering economic growth in knowledge-based, creative industries and, ultimately, redefining how the city, province, and country are perceived by the world.

TWRC Corporate Vision

Working with the community and public and private partners, the Corporation will create spectacular waterfront spaces, cultural institutions, and diverse and sustainable commercial and residential communities that offer a quality of life second to none. We will capitalize on Toronto's existing global economic clusters to establish a Portlands District for Creativity and Innovation and strive to ensure that Toronto is the city where the world desires to live.

Overall Corporate Objectives

- Develop accessible, new and improved waterfront communities and public spaces that offer a high quality of life for residents and visitors alike
- Attract innovative, knowledge-based industries to the Portlands
- Engage the community as an active partner in revitalization
- Develop strategic partnerships to attract private-sector investment

Discussions with representatives from cities around the world known for their sustainability achievements have made it clear that striving for a high level of sustainability is a formidable task. In the short-term, it may not be possible to achieve all the sustainability objectives outlined in the framework for each and every TWRC undertaking. However, the TWRC will work to build partnerships and create necessary momentum for a shift away from business as usual to a new and more sustainable way of doing things.

[1] Toronto Waterfront Revitalization Corporation 2002. *Development Plan and Business Strategy*

The Sustainability Challenge

Sustainability and sustainable development are terms that have been used more widely following the 1992 United Nations Conference on Environment and Development held in Rio de Janeiro, Brazil. At the heart of the sustainability concept is the notion that the natural environment and all human economic and social activity are inter-related.[2] Sustainability also includes the optimistic idea that it is possible to achieve a high quality of life for humankind without having a detrimental effect on nature.

At the same time, meeting sustainability objectives is not easy. It will take considerable leadership, effort, creativity, and flexibility from individuals and organizations of all types.

Balance and integrate competing objectives through creative new ways of doing things

The many different definitions of sustainability all focus on linking the impacts of current activity to quality of life in the future. The most widely cited definition is that sustainability is about meeting the needs of people today without jeopardizing the flexibility of future generations to meet their needs.[3] Another very simple definition is "do no harm, now or in the future."

A precise definition is not critical. However, it is important to revitalization of Toronto's waterfront that there is general agreement about the key aspects of a sustainable community, including:

- Social progress that meets the needs of everyone
- Effective protection of the environment
- Prudent use of natural resources
- Maintenance of high and stable levels of economic growth and employment

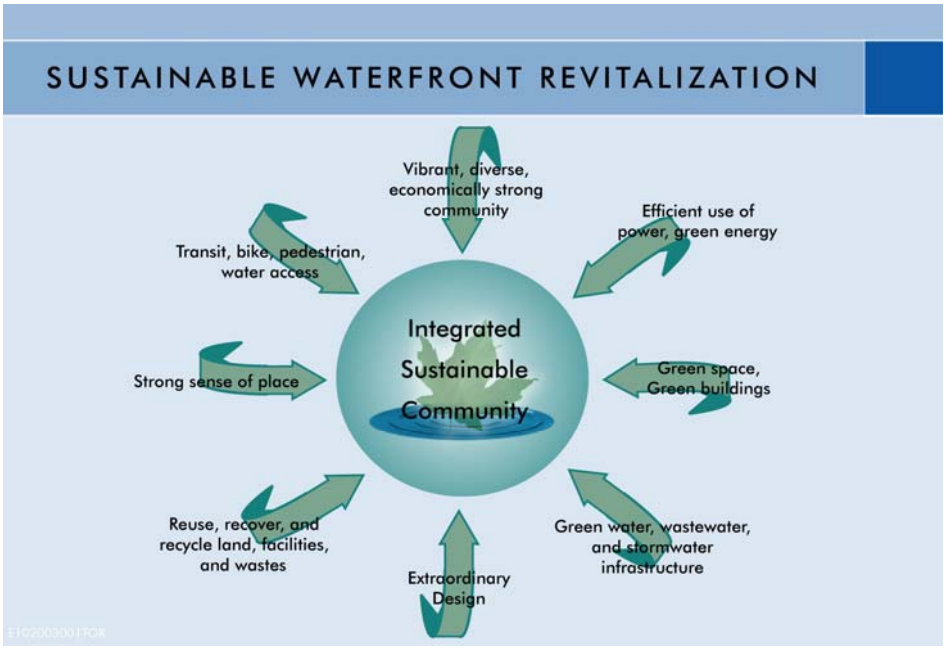
[2] Canadian Environment Assessment Agency, Sustainable Development Strategy 2004-2006.
[3] World Commission on Environment and Development (1987). *Our Common Future*. Oxford University Press.

Building a Sustainable Community

Building a sustainable community means paying attention to several important aspects of revitalization at the same time. It is widely agreed that development is not moving in the direction of sustainability unless it is characterized by:

- Achieving exemplar standards of functional and beautiful urban design
- Minimizing resource consumption and waste production
- Ensuring that participation in governance is as broad as possible
- Encouraging innovation that addresses conservation and building technologies
- Increasing economic opportunity and self-sufficiency
- Focusing on development that supports diversity of all types along with a strong sense of community

An overall sustainable approach to revitalization is based on a number of fundamental objectives, including the following:



Advancing Integration

Greater sustainability demands a move towards integration of efforts across sectors and areas of experience and interest. This is a particularly tough challenge in large or newly formed organizations such as the TWRC, where barriers to greater integration are often a result of the need for clarity about roles and responsibilities to ensure accountability and efficiency.[4]

A sustainable community embodies many different qualities, as does any community. The difference is that in place of an uneasy compromise among community objectives or a partial achievement of desired outcomes, a sustainability approach seeks to maximize community goals through purposeful integration, coordination, combination, and reconciliation.

"The planning concept of balance therefore needs to be used with some caution. There will be occasions in practice where tradeoffs need to be made – for example where providing a better quality of living environment requires more land or resource consumption. But the overall aim must be more ambitious: to seek toward integration – by seeking to improve one facet without damaging another".[5]

"The planning concept of balance needs to be used with some caution."

The City of Toronto Official Plan highlights the importance of envisioning Toronto as a "City of Connections," including economic, environmental and social networks of all kinds. This perspective is an essential part of TWRC's Sustainability Framework.

Acknowledging the Interactive System

In a similar vein, a sustainable community is developed around the idea of a settlement as an interconnected system, both internally and within the surrounding region. Communities are always part of a larger system since natural systems do not respect political boundaries. Context is the link with larger areas of political organization (region, province, and country) and global and local networks of natural systems.

[4] OECD (2002) Improving Policy Coherence and Integration for Sustainable Development. OECD, Paris.

[5] Millennium Village Review

Engaging Stakeholders

People who are linked to the waterfront because they may be directly or indirectly affected by decisions on waterfront revitalization are considered stakeholders. It is crucial to understand the needs and preferences of this group in order to support a sustainable, multi-dimensional perspective during decision-making, one that more accurately mirrors real-world conditions. Because they represent different interests, the views of stakeholders may sometimes conflict but their input remains invaluable. The TWRC's ability to build and implement an effective sustainability framework is heavily dependent on on-going consultation with a wide range of stakeholders.

The views of stakeholders may sometimes conflict but their input remains invaluable

Monitoring and Evaluation

It is essential that the TWRC monitor progress on implementation of the Sustainability Framework and continue to evaluate how well the Sustainability Framework is helping the TWRC reach its goals. Progress must be tracked from several major areas including the impact on individuals, the community, the financial bottom line, and the integrity of the environment.

What is a Sustainability Framework?

A sustainability framework lays out both the vision for sustainability and the steps that will be taken to achieve that vision. It moves from broad umbrella concepts to guiding principles, to desired outcomes, to documenting existing conditions, and to strategic actions, objectives and targets. Monitoring is an essential component of meeting the sustainability challenge, so a sustainability framework also identifies indicators for tracking progress towards sustainability goals.

The TWRC cannot implement the Sustainability Framework alone. It will rely on partners including, but not limited to, all orders of government, non-profit and business organizations, academic institutions, community groups, developers, and the interested public to meet the sustainability challenge. A wide range of partners will also help the TWRC better understand the important relationship between revitalization actions and progress on sustainability.

This 2005 Sustainability Framework (reached following several rounds and forms of consultation) will be an evolving document that will require regularly scheduled review and revision as part of the TWRC commitment to monitoring and reporting on sustainability. It will be necessary to update at least some of the goals, targets, and actions in the wake of technological developments (here and elsewhere) and improvements in our understanding of what it takes to continue to move towards greater sustainability.

How to Use This Framework

The 2005 TWRC Sustainability Framework provides direction to all major planning, design, construction, maintenance, procurement, and decision-making activities. The Framework will require occasional review to ensure that the goals and targets are reflective of current sustainability practices.

The toolkit for using the Framework to its fullest advantage is not yet complete. However, there are ways to begin using the Framework immediately.

The first step for anyone contemplating or involved in a revitalization strategy on the waterfront is to ask two questions:

- How does the TWRC's sustainability policy and requirements apply to the work that I do?
- How can this project support the TWRC sustainability vision and outcomes (see Section 2)?

Assistance with implementation of the Sustainability Action Plan, including project management checklists can be found in Appendices 2, 3, and 4.

Sustainability Checklist

Appendices 2 and 3 provide a general guideline to the sustainability actions and targets that must be taken into account during project development and implementation. Additional information is available in the Sustainability Framework and in related TWRC guidelines. The checklists are a very straightforward way of ensuring that a variety of sustainability considerations are integrated into all aspects of a project. Checklists for TWRC internal operations such as procurement are also in place.

Who Will Make Sure It Happens?

If you are not headed towards sustainability, where are you headed?

The onus is on everyone involved in waterfront revitalization to demonstrate that they are systematically moving towards sustainability. If waterfront revitalization is not headed towards sustainability, where is it headed?

Each participant in waterfront revitalization, including members of the Board of Directors, the TWRC management team, TWRC employees and associated consultants, the Waterfront Design Review Panel, business and program partners, investors, community groups, the City of Toronto, the Province of Ontario, the Federal government, current and future residents, employers, and business men and women, has an important role to play in implementing sustainability.

The TWRC will support these efforts through the clear policy contained in the Sustainability Framework, through providing information on state-of-the-art approaches to sustainability and by helping all those involved in waterfront revitalization to document their activities from a sustainability perspective.

Taking a sustainability approach requires individuals to seriously consider how sustainability principles apply to the work that they do and to adjust their approaches accordingly. It is not the job of a single individual or a sustainability expert to determine what is sustainable for a given undertaking. Sustainability experts can only provide guidance on the application of principles, point to examples from other jurisdictions, identify potentially useful tools such as integrated design process or life-cycle assessment, and continue to encourage momentum on the sustainability challenge.

It is the planners, urban designers, architects, engineers, business executives, community leaders, and government representatives, among others, who will apply sustainability principles to help realize desired sustainability outcomes on the Toronto waterfront.

Fear and Loathing of Sustainability

In some circles sustainability has a bad reputation. Sentiments such as "sustainability is just about motherhood issues" or "sustainability is about everything and therefore it's about nothing" or "sustainability is just a dry and unimaginative way of thinking about change" are common among those who are yet to be convinced of the merits of sustainability.

However, attempts to dismiss the worth of a sustainable approach to waterfront revitalization do not reflect an understanding of the value of rising to the sustainability challenge. Sustainability is not a prescriptive and constraining concept; rather, it can stimulate creativity and innovative partnerships that result in dynamic, beautiful sustainable communities as evidenced by cities in all parts of the globe.

Sustainability is not business-as-usual. Though many professionals would argue that the work they do naturally conforms to sustainability principles, often this claim does not stand up when measured against sustainability objectives.

And it is not enough to simply say that projects are sustainable. To be accountable and to be in a position to strengthen what is working over the long term, the sustainability decision-making process and hoped-for outcomes must be carefully tracked and revised as needed. Documenting how a particular project meets TWRC sustainability objectives is a vital step in ensuring that the Toronto waterfront is developed in a sustainable way.

It is not enough to simply say that projects are sustainable

For a more detailed response to concerns about sustainability, *see* Appendix 5.

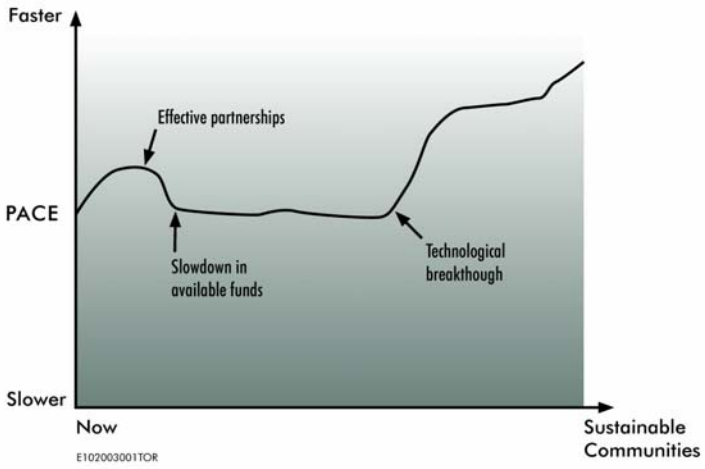
Timing and Pace

Sustainability does not happen overnight

From its inception, the TWRC has been committed to achieving world leadership in sustainable community development. There will be no backing away from this commitment. However, sustainability does not happen overnight. It requires the careful and consistent application of sustainability principles at each stage of revitalization.

Strategies and technologies will emerge over time that will make targets and goals that seem progressive today be seen as deficient by future standards. Integrating sustainability into deliberations from the very beginning will greatly increase the likelihood of achieving sustainability goals. Sustainability cannot be an add-on to business-as-usual scenarios.

The TWRC is aiming high in its sustainability objectives – after all, what is the value of reaching for mediocrity? – but it will also take a realistic approach to achieving those objectives. For example, water quality in the inner harbour that is suitable for swimming throughout the summer is dependent on many factors over which the TWRC does not have control, such as stormwater management strategies throughout the GTA. It is unrealistic to think that this could happen in the next year or two but is it a more realistic goal when looked at over a 20 or 30 year timeframe.



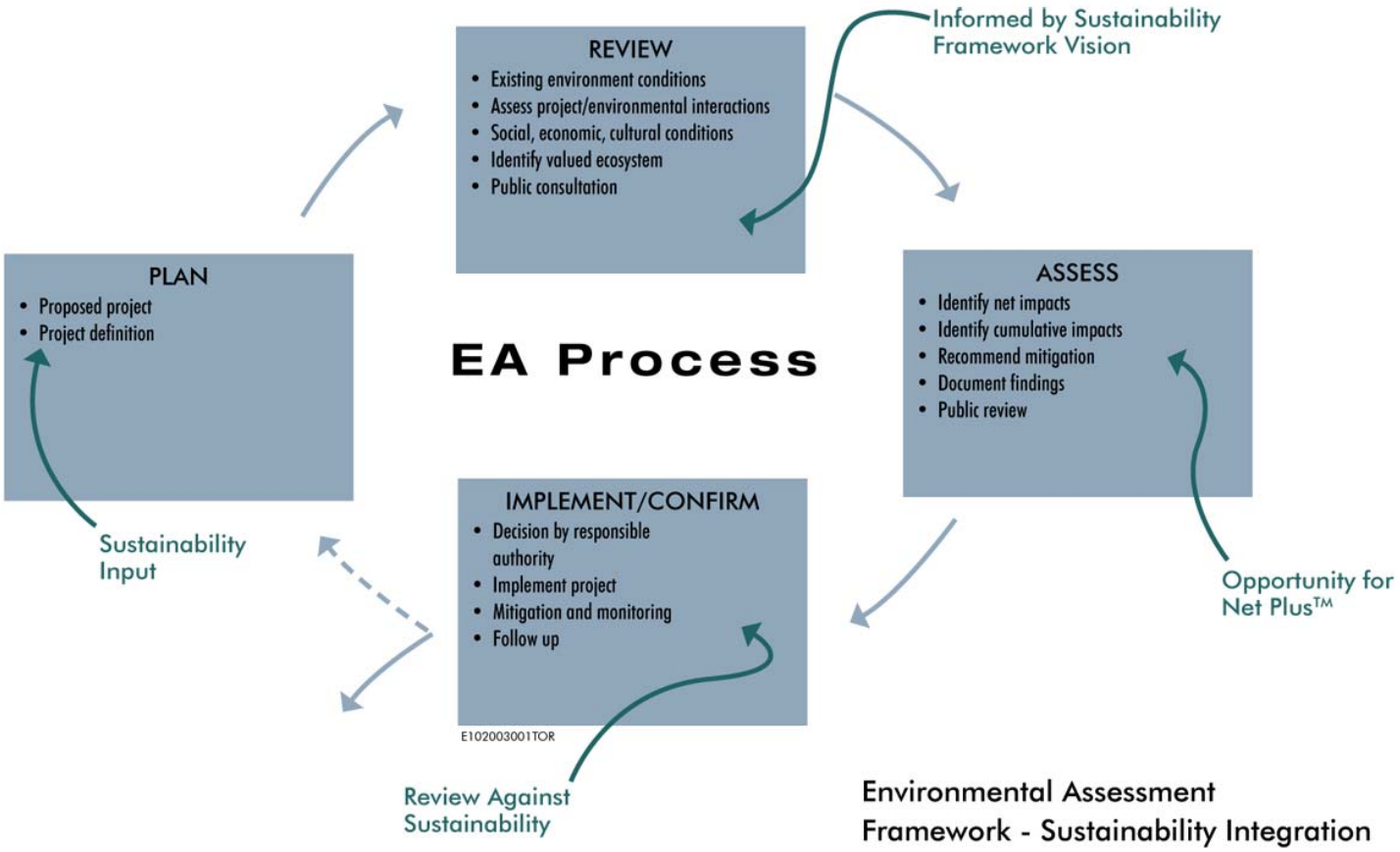
Example of factors that might influence the pace of implementation

TWRC's commitment to achieving sustainability goals will be unwavering but, to some extent, the pace of implementation will be determined by factors that will cause it to vary over time. This approach has been likened to a louvered ramp that can be adjusted according to knowledge and capacity levels, technology options, partnership opportunities, the availability of funding and other factors affecting implementation (see diagram on this page for an example).

The Sustainability Framework and other TWRC Projects and Programs

The Sustainability Framework has relevance for almost all TWRC activities. Because several major projects began before the Corporation had a senior management team in place, there was an early lack of coordination between the Framework and other projects. This is gradually being addressed, including a sustainability review of all major planning activities by an expert team from Sweden in the fall of 2004. Early consultation on the framework brought together project managers to discuss the relationship between sustainability principles and major TWRC projects.

Although sustainability is not only about environmental issues, the diagram below provides an excellent example of how the sustainability framework and one facet of waterfront revitalization, environmental assessment, are related:



Environmental Assessment Framework - Sustainability Integration

Determining Priorities

The TWRC is determined to focus, first, on those strategies that make the greatest contributions to sustainability in the most cost-efficient way. As well, the Corporation is committed to consultation and collaboration to better understand the priorities of its stakeholders.

Sustainability is a relatively new field so it is not always clear which activities make the biggest difference. In general, we know that progress depends to a great extent on innovative partnerships and multi-perspective decision-making with a focus on long-term viability and balancing and integrating benefits across many areas of influence and interest. It requires broad, big-picture thinking combined with practical on-the-ground process and technological realities.

Some aspects of moving towards sustainability are well-known such as energy efficiency in buildings. Very little is known about other aspects such as how to achieve social inclusion as part of dynamic sustainable community development. And some aspects are relatively well-known but continue to experience great leaps in efficiency and acceptability such as water recycling and energy recovery and use.

Ultimately, the sustainability priorities will include those that emerge through consultation, the initiatives that are central to sustainability but cannot be added on at a later date – such as sustainable infrastructure planning, and actions that have interest and support from TWRC's partners.

SECTION 2

MADE IN TORONTO

SECTION 2

Made in Toronto

There is no single approach to sustainability that fits every community

The Toronto waterfront needs a made-in-Toronto sustainability vision and action plan. There is no single approach to sustainability that fits every community. Experience elsewhere demonstrates that it is through the systematic application of sustainability principles based on solid information about existing environmental, economic, and social conditions that a community will find its own pathway to sustainability.

The Toronto waterfront has been the focus of a Federal Government Royal Commission, the 2008 Olympic Bid and numerous studies and visioning exercises over the last few decades. The TWRC Sustainability Framework has drawn from this body of work and is designed to complement existing City of Toronto plans including the Central Waterfront Plan (see Box 1), the Official Plan, the Environmental Plan, Economic Development Strategy, Social Development Strategy, and the Culture and Heritage Plan.

Box 1: Core Principles of the City of Toronto Central Waterfront Plan[1]

A. Removing barriers/making connections
B. Building a network of spectacular waterfront parks and public spaces
C. Promoting a clean and green environment
D. Creating dynamic and diverse new communities

The Sustainability Framework is built on up-to-date information about existing conditions such as the City of Toronto 2003 Waterfront Scan and Environmental Strategy and the TRCA's Waterfront Aquatic Habitat Restoration Strategy and Terrestrial Natural Heritage System Strategy. The TWRC also completed in-depth research into best-practice sustainability for cities and waterfront communities worldwide; identified sustainability design opportunities as part of East Bayfront Precinct Planning, and held a two-day working meeting with members of the TWRC senior management team and local and international sustainability experts.

[1] City of Toronto 2003. *Central Waterfront Plan*

Our Starting Point

The Toronto waterfront is a mix of sustainability opportunities. It is the part of the City with the largest area of contaminated lands. It is characterized by its proximity to the natural beauty of Lake Ontario but also by abandoned and under-utilized sites. Most of the area is not easily accessible to the public because the area is not well-served by public transit and large tracts of derelict land decrease the appeal of accessing the lakeshore in its current state. The area is under-developed from an economic perspective but, as a result, offers great potential for investment and job creation.

While there are pockets of communities along the waterfront, such as the intense residential development at the central harbourfront, there is not an extensive variety of residential and recreational options nor a strong sense of dynamic accessible communities along the waterfront.

In the broader context, the City of Toronto will continue to grow and continue to put pressure on the surrounding regions for housing, thus driving development on agricultural lands and impinging on areas of natural beauty and ecological significance.

Moving Forward on Sustainability

Reurbanization is defined by the City of Toronto's new Official Plan as a coordinated approach to redeveloping land within the existing urban fabric to accommodate regional growth. Through reurbanization efforts on the Toronto waterfront, the TWRC is already taking a solid step forward on sustainability by:

- Providing opportunities for creating extraordinary sustainable communities along the Toronto waterfront
- Reducing the speed at which agricultural lands surrounding the City are converted to residential and other uses
- Protecting high-quality agricultural lands to increase food security for the region
- Reducing pollutant emissions and reducing the use of non-renewal natural resources from car and truck use by

Through reurbanization efforts, the Toronto waterfront is already taking a solid step forward on sustainability

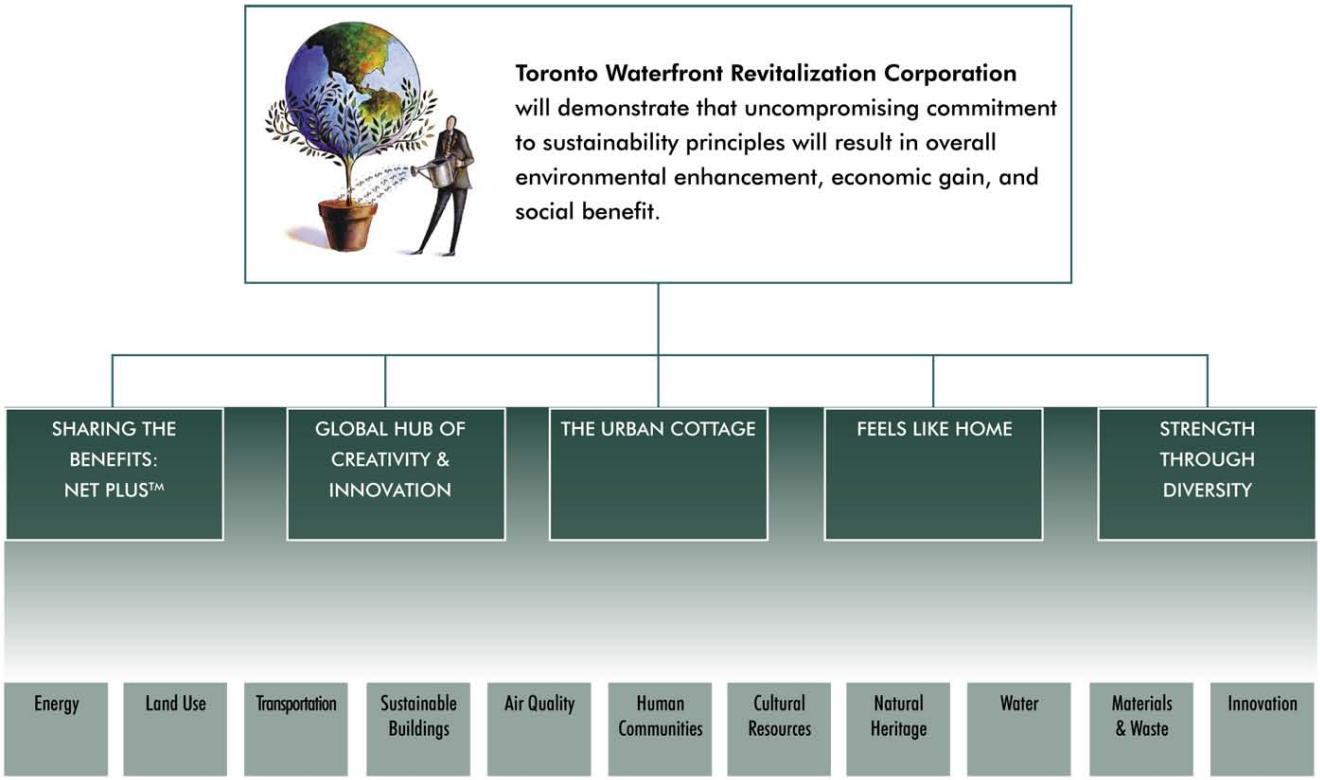
encouraging live/work options that reduce the need to drive to work

- Reusing or improving existing infrastructure, thus saving on the use of natural resources, reducing the need for capital investment, and strengthening opportunities for development in existing urban areas
- Focusing on transit-led development
- Remediating contaminated lands
- Increasing the diversity of land use
- Increasing opportunities for economic development
- Improving plant, animal, and aquatic habitat
- Increasing the amount of public recreational space

Overview of TWRC's Sustainability Framework

The framework is organized around:

- An overall sustainability mission that drives the TWRC's sustainability mandate
- A series of five broad, distinctive goals that, taken together, illustrate the sustainability vision and provide detail on the desired outcomes of waterfront revitalization
- Eleven interrelated themes that reflect the basic areas of focus for action on sustainability
- Baseline information, actions, strategies and targets to help attain the envisioned sustainability outcomes



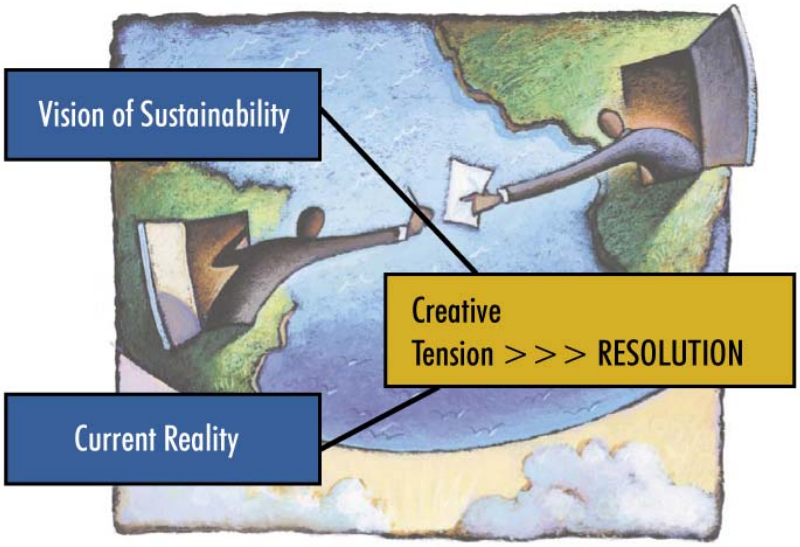
The Sustainability Mission

The TWRC Development Plan and Business Strategy and Annual Report affirm the Corporation's commitment to sustainability. In working meetings with TWRC staff and local and international sustainability experts, the sustainability mission for the Corporation became clear:

The Toronto Waterfront Revitalization Corporation will demonstrate that uncompromising commitment to sustainability principles will result in overall environmental enhancement, economic gain and social benefits.

Creating a Vision

Moving forward on sustainability requires formulating a vision that links sustainability principles to values and principles. The vision presents the belief system underlying sustainability and states the type of commitment that an organization or community is prepared to make. The vision may also outline expectations from stakeholders such as board members and people living in nearby communities, as well as national and provincial governments. As the figure below illustrates, developing a vision requires creativity and innovation.



"Big Hairy Audacious Goal" is a term coined by business author Jim Collins in his best seller *Good to Great*.[2] Collins argues that BHAGs are what differentiate good companies from great ones. Big Hairy Audacious Goals are a combination of **deep passion** (including core values and purpose), an understanding of what it takes to be the **best in the world**, and insight into the **economic drivers** behind a particular initiative.

Collins' concept of large, inspirational goals is useful for clarifying the sustainability vision for the Toronto Waterfront. Sustainability relies, in part, on working towards integration and balance among potentially competing interests. The following big integrated goals give shape to the more general sustainability commitments for the Toronto waterfront.

2 Jim Collins (2001). *Good to Great*. Harper Collins Publishers

TWRC Sustainability Vision and Outcomes

Sustainability outcomes are what a community is designed to achieve rather than the decisions, incremental steps, strategies and tactics used to reach the outcomes.

Sustainable communities need to measure performance in terms of outcomes – for example, whether people enjoy easy access to a range of amenities without needing a car – rather than outputs such as mixed use patterns or inputs such as public transport provision. Mixed use patterns are of little benefit, for example, if people still travel outside the area to schools, jobs, and recreational facilities.

Sustainable communities need to measure performance in terms of outcomes

The same is also true for development of brownfields. Increasing densities in the urban core while saving green space on the outskirts of the City is certainly supportive of the sustainability challenge. However, alone, it does not demonstrate commitment to leadership on sustainability nor does it automatically ensure dynamic, sustainable communities. Sustainability outcomes are multi-dimensional and focused on long-term viability. They do not benefit only a handful of interests or focus on one or two issues as the primary determinates of greater sustainability.

Working Towards Five Interrelated Outcomes

The TWRC's Sustainability Vision is expressed in the form of five outcomes that reflect the desired characteristics of waterfront communities as a result of revitalization. Each outcome is linked to the objectives, actions and targets outlined in the Sustainability Action Plan in Section 3. The outcomes and associated objectives are presented in the following pages.

Sharing the Benefits: NET PLUS™

Building vibrant sustainable communities on the Toronto waterfront will have positive implications for the City, the surrounding region, the Province and Canada as a whole. Through a systematic application of sustainability principles to all activities and decision-making the environment will be enhanced, the economy will be stimulated and communities will be strengthened.

NET PLUS™ is the term we use to express the idea that revitalization will provide sustainability benefits in a way that has an overall positive net impact on-site and to the city as a whole. This includes objectives for energy efficiency, renewable energy use, economic development and sustainable livelihoods, recreation including fishing and boating, water conservation and water quality, mixed land use, innovation, high quality design, public art, integrated waste minimization and management, culture and heritage and other aspects of sustainable community development.

Over the next 20 years the waterfront will become NET PLUS™ for all facets of revitalization.

Global Hub of Creativity and Innovation

The Toronto waterfront will emerge as the global hub of creativity and innovation. Revitalization of the Toronto waterfront will drive the economy through leadership in sustainability and make the waterfront a place where people are drawn by the range of opportunities for innovation and investment.

Toronto will be *the* demonstration city for sustainable development by celebrating our cultural diversity, environmental stewardship and unique setting as an urban waterfront development and offering a multitude of opportunities for innovation and leadership. Our creative economic models will facilitate a level of business start-ups and sustained economic growth second to none. Our thoughtful planning and design of the built environment will result in the Toronto Waterfront emerging as a place of extraordinary beauty.

The Urban Cottage

Revitalization of the Toronto waterfront will result in the tranquillity, recreational activities, clean environment, aquatic and terrestrial habitat and natural “wildness” of a northern lakeside cottage with year-round recreational and cultural opportunities, green space, access to the lake and environmentally safe public amenities including clean beaches open for swimming and fish populations suitable for eating.

Feels Like Home

The waterfront will become a place where all Torontonians of all ages from all corners of the globe and all walks of life will feel welcome, safe and included; where a network of public transit and technologies eases communication, live/work options, mobility and the development of neighbourhoods and communities. It is also a place where Toronto's past is protected and celebrated authentically.

Strength Through Diversity

Systems of all kinds - including ecological and economic systems- are stronger and more resilient when they embody diversity. The long-term viability of sustainable communities is in large part due to their ability and willingness to adapt to change in a positive way.

Strong diverse systems are an indispensable outcome of waterfront revitalization including biological diversity and a suitable energy mix from renewable sources as well as diversity of opportunity for investment, partnerships, businesses, employment and technology. Strong diverse systems will also mean balancing the use of resources by locating and acting upon synergies among resource flows of energy, water and waste.

SECTION 3

SUSTAINABILITY ACTION PLAN

SECTION 3

Sustainability Action Plan

The following sections lay out a series of goals, actions, and targets according to themes identified during various Sustainability Framework development initiatives, including a two-day Sustainability Working Meeting among senior TWRC staff and those with local and international knowledge about different facets of sustainability.

This framework includes feedback received from the City of Toronto, the Federal Government, the Government of the Province of Ontario, the Toronto and Region Conservation Authority and representatives from community, business, environmental, urban design, academic organizations, and members of the general public.

The Sustainability Action Plan reflects what is known today about reaching the desired sustainable community outcomes articulated in TWRC's sustainability vision (see Section 2). However, to be effective and to remain relevant, the goals, actions and targets will need to be revisited on a regular basis and revised based on what is working well and what needs to be reformulated. Experience on the Toronto waterfront and in other jurisdictions will inform the review process.

The goals, actions and targets that follow are based on existing conditions in the City of Toronto as a whole, and the waterfront in particular, as well as on best-in-class sustainability examples from around the globe, nearly two decades of studies and plans on the Toronto waterfront, and the desire to make the Toronto waterfront *the* foremost sustainable waterfront community.

Many of the goals and actions are interrelated and provide environmental, economic, and social benefits across several theme areas. The clearest example of an interconnected relationship is between energy, air quality, and transportation.

Energy

Goal: Significantly reduced levels of per capita energy consumption coupled with a greater use of low-impact renewable energy to meet energy demands.

Rationale

Energy consumption is a prime determinant of whether or not a community moves towards greater sustainability. **No community is considered a sustainable community without a genuine commitment to sustainable energy practices.** The type of energy produced and the amount of energy consumed has significant impacts on local air quality and global concentrations of carbon dioxide and other greenhouse gases that contribute to climate change. Fossil fuels are damaging to public health and the natural environment throughout the fuel cycle of mining, processing, transporting, combustion and disposal of wastes.

All three levels of government recognize the importance of energy conservation and its link to public health and environmental well-being:

- The Federal Government has recently launched the One Tonne Challenge. The challenge encourages individual Canadians to reduce their carbon dioxide emissions by 20% which translates to approximately one tonne of carbon dioxide per year.
- The Government of Ontario is encouraging reduced consumption through the installation of “smart electricity meters” in residences that will tell people how much energy they are consuming and provide preferential rates for energy use outside 6 am to 8 pm.
- The City of Toronto also continues to work towards its 1998 commitment to reduce carbon dioxide emissions by 2010 to 20% below 1990 levels.

Current Conditions

Nearly all the energy consumed in Toronto is generated outside the City limits. Approximately 78% comes from non-renewable sources (fossil fuels and uranium for nuclear power) with the remainder coming from large scale hydro power. Non-

renewable forms of energy are damaging to public health and the natural environment throughout the fuel cycle of mining, processing, transporting, combustion and disposal of wastes.

Renewable sources of energy include offshore wind, solar photo voltaics, small-scale building-size wind turbines, small hydro, biomass, landfill gas, wave/tidal power and geothermal. To achieve energy conservation goals, energy efficiency measures must be taken into account from the very beginning of infrastructure and building design.

Within the City there are a small number of home owners and businesses who have installed photovoltaics to off-set conventional energy use. In addition, Windshare and Toronto Hydro collaborated to install the ExPlace wind turbine at the Exhibition Grounds that generates continues to generate very low amounts of energy that is transferred to the Toronto Hydro grid.

For additional information on energy conditions and alternative energy strategies on the Toronto waterfront see The City of Toronto (2003) *Waterfront Scan and Environmental Improvement Strategy*. Chapter 5: Energy.

Sustainability Response

As mentioned earlier, integrated strategies are essential to the realization of sustainability outcomes. Reduced emission levels will only result from a more integrated energy strategy, that is, a strategy that reduces the demand for fossil fuels through the

implementation of energy efficiency measures and increased use of sustainable transportation options such as walking, cycling, and public transit. To maximize reductions in pollutant emissions, reductions in demand must be accompanied by an increase in the availability and use of renewable energy sources.

The Toronto waterfront will demonstrate exemplary environmental stewardship through sound decisions involving the energy for all infrastructure, services, buildings, and transportation choices. By aggressively pursuing a Net Plus™ energy plan, the Toronto waterfront will not only conserve and generate energy adequate for the complete needs of the Toronto waterfront but will, over time, generate revenue as well as social and environmental benefits by selling clean energy to the greater Toronto area.

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Objective: High levels of energy efficiency

Strategy: Energy efficiency measures during site and infrastructure planning, building retrofit, design and operation.

Action: Land use planning based on mixed land use and a compact development form to hold the energy profile at a close to steady state in spite of increased development and to reduce energy needs.

Action: Make use of a district energy system (or systems) that relies on a local energy producer to generate and distribute electricity, heating, and cooling. The close proximity of producer and consumer dramatically decreases the amount of electricity lost over transmission lines and allows otherwise wasted heat to be shared with adjoining buildings.

Action: Compile an inventory of financial incentives for builders and owners, including rebates, matching funding, funds for pilot projects and tax incentives associated with energy efficiency initiatives[1].

Action: Design buildings with high levels of energy efficiency (links to action on LEED Gold and Platinum standards)

A1.Target: All new residential and commercial buildings designed between 2005-2007 will be 40% more energy efficient than Canada's Model National Energy Code for Buildings (MNECB). All new buildings from 2008 onwards will be 50% more energy efficient than Canada's MNECB.

A2.Target: All new buildings designed between 2005-2007 will incorporate measurement and verification components and protocols.[2]

[1] Examples of current programs include Natural Resources Canada's Commercial Building Incentive Program, Industrial Building Incentive Program and Energy Innovators Initiative.

[2] City of Vancouver, Southeast False Creek

Objective: Increase the percentage of energy consumption from renewable sources

Strategy: Reliance on renewable energy sources that have low impacts on air pollution and global warming and that increase energy self-sufficiency thus reducing pressure on the provincial grid.

Action: Detailed technical studies:

- Of the potential for energy generation from solar, wind, and geothermal sources on the Toronto waterfront (to be completed within two years).
- Of the potential for energy production from methane on the Toronto waterfront

Action: Feasibility study to identify short-term, mid-range, and long-term on-site renewable energy strategies. The study will investigate district-wide renewable energy opportunities as well as building specific strategies. It will also address cost-benefit implications, funding options, risk assessment, and include an implementation plan (to be completed within the next two years).

Action: Develop daylighting guidelines for the precinct planning of the Portlands by June 2006.

- Until the completion of the daylighting guidelines for precinct planning, building orientation and configuration should take into account the daylighting benefits associated with streets oriented predominately on an east-west axis with slender buildings oriented length-wise on an east-west axis, taller building located on the north end of blocks and shorter buildings along the south end of the blocks.

Action: An illustrated summary of climate data will be prepared and placed upon a public domain web site for all precincts and building designer's reference by spring 2006.

- The graphically represented data, based upon 30 year averages, will include monthly temperatures, precipitation and snow fall, wind speed and direction, overhead sky

conditions, solar degree days, sun paths, lake temperatures, and air quality.

Action: Aggressively pursue the purchase of off-site green power through local utility vendors for both short-term and long-term energy needs from sources such as wind farms, low-impact fish-friendly hydro power, solar-electric farms, and geo-thermal power generation facilities.

Action: Develop a strategy for making the Toronto waterfront an net exporter of energy from renewable fuel sources within the next 20 years.

A3.Target: 20% of energy from renewable sources by 2010 using the City of Toronto 2004 levels as a baseline.[3]

A4 Target: Purchase 30% of electricity needs from low-impact renewable energy by 2010; increase that to 80% by 2020.[4]

[3] Renewable Energy Obligation 2000, Government of the United Kingdom

[4] Clean Air Renewable Energy Coalition 2004

Objective: Reductions in per capita greenhouse gas emissions

Strategy: Increase awareness of link between energy use and greenhouse gas emissions (strongly related to transportation, land use and infrastructure planning, and air quality considerations).

Action: Develop strategy and subsequently install technology to track carbon savings associated with energy efficiency in residential and commercial buildings.

A5.Target: 50% of residences and businesses engaged in tracking carbon off-sets.[5]

Action: Set target for reduced per capita energy use using 2004 as the baseline.

A6.Target: 40% less CO_2 emissions per capita than current average by 2025.[6]

[5] Target set at 25% by Malmo, Sweden

[6] City of Vancouver, Southeast False Creek

Land Use

Goal: Land use planning that supports sustainable community development.

Rationale

Land use planning is a fundamental driver of sustainable communities and links to most of the themes in the Framework. It provides the physical context within which communities grow but it is the principles underlying land use planning decisions that determine how features such as street layout, open space and building placement combine to bring vitality and diversity of opportunity to the Toronto waterfront.

Current Conditions

The Central Waterfront Plan and the new Official Plan provide the broad directives based on City of Toronto priorities for land use. Both these documents demonstrate strong commitments to building sustainable communities. For planning purposes, the Toronto waterfront has been divided into four precincts.

Planning for the East Bayfront and the West Donlands precincts is near completion. Elements of planning in the Portlands precinct, such as phasing of development and consideration of the 18 hectare Commissions Park, have also begun.

Sustainability Response

Sustainable land use will optimize street layout and building placement to capture energy savings, access to lake and community interaction.[7]

Good urban planning has always been about finding balance among competing interests in a way that results in a high quality of life. In many respects this is consistent with a sustainability approach although it is incumbent on planners and urban designers to be explicit about how their decisions were shaped by an intent to move forward on sustainability.

Sustainable communities rely on a mix of uses to bring diversity and vibrancy to an area. From a land use planning perspective that means the best land use planning is in no way

[7] Oakland Sustainable Design Guide

homogenous. Mixed land use and compact urban development are essential to community sustainability.

Other links between sustainability and land use planning include building placement that optimizes energy efficiency options and community interaction and features such as east/west recreational trails, north/south vistas, and fully integrated transit-system land use that encourages frequent interactions of residents, workers, visitors, and learners.

Of particular importance on the Toronto waterfront is easy access to the lake along with excellent views of the lake. Increased access and visibility will contribute to the long-term viability of the area by inviting on-going "interaction and engagement with the waterfront."[8] Street layout that is welcoming and encourages walking and community interaction year-round are also essential to the sustainability of waterfront communities.

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8 City of Toronto 2003 Central Waterfront Plan

Objective: Development patterns consistent with sustainability

Strategy: Mixed land use.

Action: Conduct consultative precinct planning that results in mixed land use, balancing residential, commercial, industrial and parks and open space and compact urban development with excellent access to the lake, to public transit, and to community and recreational features.

Action: Determine minimum targets for pervious land surface and green space.

Objective: Vibrant street life

Strategy: Attract people to the streets.

Action: Orient buildings and streets to ensure most walking zones have good sunlight for a significant part of the day.

Action: Install three to four kilometers of well-designed walkways that are attractive and functional throughout all four seasons, regardless of climate.

Action: Designate car-free zones.

Objective: Maximize opportunities for use of renewable energy

Strategy: Taking energy requirements into account during land use planning.

Action: Orient building and streets to optimize access to natural lighting and heat from winter sun.

Objective: Enhanced animal and aquatic habitat

Strategy: Site design that accommodates animal and aquatic habitat.

Action: Habitat enhancement along the water's edge – including harder edge on the western side and more wetland - as on the east.

Action: Create and maintain networks of natural systems both within the site and beyond its boundaries including linking the Don River corridor, Cherry Beach, Lake Ontario Park, and the Leslie Street Spit.

Action: Infrastructure creation that facilitates understanding, appreciation, and use of fish and wildlife resources.

Objective: Compatibility between designated land uses and sustainable infrastructure

Strategy: Coordinate infrastructure and land use planning.

Action: Site development adjacent to existing infrastructure.

Action: Ensure that open spaces and parks planning complement objectives of the City of Toronto's Wet Weather Flow Management Master Plan.

Action: Ensure that site development and building placement strengthen opportunities for district energy solutions.

Objective: Recapture value of abandoned and underused sites

Strategy: Redevelop abandoned sites.

Action: Create a Brownfields Remediation Strategy for the Toronto waterfront.

Transportation

Goal: Make alternative transportation options such as walking cycling and public transit the natural choice for residents and visitors to the waterfront area.

Rationale

The use of cars is a major contributor to air pollution both through the use of fossil fuels and, to a lesser extent, the energy embedded in materials used in cars. Even if non-polluting sources of fuel become common place one-day, the widespread use of cars will still have a negative impact on the environment through the expansion and building of roads through agricultural and natural ecosystems.

Current Conditions

The central waterfront is relatively well-serviced by transit due to a light rapid transit (LRT) line along Queens Quay and a subway stop and regional transportation hub (Union Station) nearby. The Portlands area in particular is poorly served by transit.

The number of vehicles in the Greater Toronto Region continues to grow as does the number of trips made by car. Trips between Toronto and the GTA have increased slightly every year for more than a decade. Inside the city, the total number of trips made by public transit has decreased over the last few years (while the population has increased). Trips by bicycle and by foot continue to rise.

"Compact urban forms that encourage many walking trips, and good pedestrian access, also provide good pedestrian access to transit services. People who make walking and cycling trips instead of automobile trips are also likely to be heavy transit users. In a very basic way, the primary competition for travel mode is between automobiles, and the combination of transit-walk-cycling".[9]

Sustainability Response

Sustainable communities maximize the use of alternative transportation options for moving people and goods. Getting

[9] Toronto Transit Commission 2003 Ridership Growth Strategy

people out of cars and walking or cycling has significant public health benefits, decreases contributions to global warming and contributes to community vibrancy through increased opportunities for interaction.

The Central Waterfront Plan has laid out a "transit first" strategy for the Toronto waterfront. It includes a staged implementation schedule and financial plan for construction and operation of transit facilities in advance of or in parallel with significant waterfront development. The strategy stresses the importance of achieving model split objectives from the very beginning of detailed planning for the area.

Transit ridership can be increased by initiatives that:

- encourage transit-friendly compact urban form;
- modify rights-of-way and introduce regulations which increase the relative speed of transit travel compared to automobile travel – for example, by converting travel lanes to bus-only rights-of-way, and introducing more-stringent peak period parking and turn prohibitions on major transit routes;
- increase the relative cost of automobile use through increased fuel taxes, road tolls, and increased parking costs; and
- minimize highway construction and discourage low-density development on the suburban fringe of the urbanized area.[10]

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[10] Toronto Transit Commission 2003 Ridership Growth Strategy

Objective: Minimize car use

Strategy: Discourage car use.

Action: Restrict opportunities for parking on-site.

Action: Designate car-free zones.

Action: Minimize amount of impervious paved surfaces for roads and parking.

Action: Reservation service for car pooling by 2010.[11]

C1.Target: Individual waterfront resident driving a maximum of 1300 kilometres per capita per year.[12]

C2.Target: all residences within 350 metres of a light rapid transit (LRT), streetcar or bus stop.[13],[14]

Strategy: Mixed use planning to minimize car use.

Action: Situate basic shopping needs and personal services within walking distance of residential units.

Objective: Increase walking cycling and public transit use

Strategy: Make walking, cycling and public transit attractive options.

Action: Create bike paths and pedestrian linkages with and between waterfront neighbourhoods and the rest of the City.

Action: Create extensive on-site bicycling facilities -improving on the existing zoning by-law for bicycle parking requirements (.75 space/unit for residential; 6 spaces/ commercial building plus one shower).[15]

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[11] Malmo, Sweden and Hammarby Sjostad, Stockholm Sweden

[12] The City of Toronto Waterfront Scan & Environmental Improvement Strategy Study indicates that an effective sustainable transportation plan would result in residents on the waterfront driving a maximum of 1321 kilometres/yr as opposed to the current City of Toronto overall average of 3,023 km/yr.

[13] City of Vancouver, Southeast False Creek

[14] See also City of Toronto report to Council from Policy and Finance Committee June 28th, 2004 "Transit First" Investments in Toronto's waterfront.

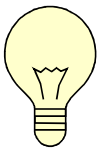
[15] 2002 City of Toronto Bike Plan: Shifting Gears

C3.Target: one bicycle storage or parking space per 100m^2 residential space.[16]

C4.Target: six bicycle parking spaces per 1000m^2 commercial space and an appropriate number of showers for building tenants.[17]

Action: Implement community walk-to-school programs such as the "walking school bus".

C5.Target: 75% of children living and attending school on-site using alternatives to cars and buses for travelling to school.



Sustainability Showcase

Solar Powered Lighting for Transit

A proposed10,000m^2 solar concentration canopy over the Light Rapid Transit corridor along Queens Quay is another excellent example of a sustainability initiative that could bring economic benefits (use of local suppliers, construction jobs, long-term payback in energy savings) along with environmental enhancement through improved air quality and the social benefit of easy access to transit and the Toronto waterfront.

Idea Source: Sustainable Edge 2004. Sustainable Opportunities for East Bayfront Precinct Planning

[16] ESD Guide Melbourne Docklands
[17] ESD Guide Melbourne Docklands

Sustainable Buildings

Goal: Elegant architectural building systems that reduce negative environmental impacts and provide high indoor air quality and exceptional comfort.

Rationale

Sustainable building systems are ones that meet sustainability objectives for reduced use of natural resources during construction and during operation. They provide high levels of personal comfort for their occupants due to exceptional indoor air quality and a strong connection to the outdoors. Where possible, sustainable building systems also anticipate future technologies and take this into account during design. They demonstrate elegant architectural solutions to these challenges.

Addressing the sustainability dimensions of a building site, such as aesthetic compatibility with the existing community or natural setting, presence of contaminated soil, or a lack of existing infrastructure, can enhance the sustainability features of a building and make a much greater contribution towards a sustainable community than a stand-alone building.

Current Conditions

In Canada, buildings are responsible for over 35% of all energy consumption,[18] 30% of all greenhouse gas emissions, and a substantial percentage of both raw materials use and solid waste generation. During the past twenty years, considerable advances have been made to reduce the overall environmental impact of new buildings.

The merits of sustainable building systems (sometimes referred to as green buildings) are seldom questioned. Slowly, sustainable building systems are coming onto the market but they still account for only a small fraction of all new construction. Retrofits of existing buildings are also becoming increasingly common in the City of Toronto encouraged by programs such as the City of Toronto Better Building Partnership and Natural Resources Canada's Energy Retrofit Assistance for Commercial and Institutional Buildings.

[18] Natural Resources Canada. 1999 Canada Emissions Outlook: An Update

RWE AG Building
Essen, Germany

The primary obstacle to the construction of sustainable building systems is the perception that they are significantly more expense to build than conventional buildings. There is a growing body of evidence to suggest that this is not case, particularly over the long-term where the efficiency aspects of the building can result in dramatic savings in operating costs for essentials such as heat and light.

The TWRC also faces the challenge of most major waterfront development authorities: how to encourage the construction of sustainable buildings where the builder is not the operator of the building system. In other words, how can the TWRC convince builders to accept the potentially higher up-front capital costs associated with sustainable buildings when the cost savings of doing so benefit the future owners and operators of the building.

Sustainability Response

The Toronto waterfront will be a showcase of the multitude of innovations in high-performance building design, current and emerging. They will be built to last and will make use of existing on-site materials where it is safely possible to do so.

The TWRC will choose land revitalization that supports sustainability by exploring options to conventional large-scale, top-down commercial development processes. Examples of alternatives include coordinated development of several sites within a designated area to promote diversity, sale of land to individual households or syndicates of households or not-for-profit agencies that will to conform to strong sustainability standards, or accepting a less than market return on land in exchange for achieving higher sustainability performance.

During the past ten years, the combined efforts of pioneering architects and building engineers have come together to create a new generation of architecture with substantially reduced environmental footprints and increased occupant health, comfort and productivity. These building systems are the result of a new integrated design process that brings together a wide variety of disciplines early in the design process and seeks to maximize efficiency and elegance of design from a systems perspective.

Sustainable buildings on the Toronto waterfront will meet economic and social demands for building longevity by focusing

on durability of materials and systems and flexibility of building use. Sustainable buildings will apply Leadership in Energy and Design (LEED) standards through an integrated design process to implement appropriate energy efficiency measures, recycle materials, use materials from sustainable sources and local sources, and reduce the generation of construction and demolition waste over conventional building systems.

LEED standards address indoor air quality through measures such as natural lighting and ventilation and minimizing the use of materials that have off-gas properties. LEED also encourages the use of appliances with high energy efficiency.

The sustainability features of the building site are an important component of LEED. For example, is the proposed building in an area with existing infrastructure or part of a brownfield remediation scheme?

For more detailed technical discussion of sustainable buildings on the waterfront, please see the TWRC's *Green Building Standards*.

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Hearst Headquarters
New York
(Norman Foster and Partners)
York University
Computer Science Building,
Toronto (Busby + Associates /
architectsAlliance)
Lake View
Residential Units,
Hammarby Sjostad,
Stockholm

Objective: More sustainable buildings

Strategy: Market sustainable building concept.

Action: Produce marketing materials aimed at the development community and at the general public outlining the benefits of sustainable buildings.

Action: Develop an awards program that recognizes excellence in sustainable building design on the Toronto waterfront.

Strategy: Showcase sustainability buildings of outstanding beauty and high performance.

Action: Build an exemplary sustainability building or set of buildings very early in the waterfront revitalization process.

Objective: High-performance sustainable building systems

Strategy: Integrated design process.

Action: Hold integrated design workshops with members of the design, construction, and operations teams at the beginning of all major building initiatives.

Action: TWRC building and site design request for proposals and terms of reference will stipulate the use of an integrated design process.

Strategy: Apply LEED standards.

Action: Make LEED standards available to all interested parties.

D1.Target: All new buildings designed between 2005-2008 will conform to LEED Gold certification. During 2008, an evaluation will be carried on the feasibility of all new buildings conforming to LEED Platinum.

Objective: Building sites that maximize sustainability opportunities

Strategy: Locate buildings close to existing infrastructure or in under-serviced areas such as the Portlands; site buildings to minimize the need for new infrastructure and resource use.

Action: Explore the opportunities for different types of district heating and cooling, capitalizing on economies of scale and long-term financial arrangements.

Objective: Buildings that are compatible with a high quality of life in associated communities

Strategy: Buildings that contribute to a sense of community.

Action: Barrier-free design consistent with the City of Toronto's Accessibility Design Guidelines for all major public buildings and facilities on the Toronto waterfront.

Action: Design buildings and sites to allow sunlight into corridors and courtyards. For example, keep buildings low in the front to allow sunlight into the street.

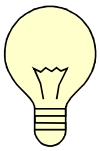
Strategy: Buildings that allow residents, workers, and visitors to the waterfront to feel connected to nature.

Action: Design buildings that incorporate atria, winter gardens, roof-top gardens, terraces, green houses, and other elements that visually connect people with plants. Commercial building designs will enable all occupants with stationary desks to maintain visual access to the outdoors.

Objective: Long life for buildings and related structures

Strategy: Buildings that allow for full adaptability over time.

Action: Super-size the height of the first floor of residential buildings to allow for easier conversion to commercial uses over time.



Sustainability Showcase

Ambitious Durability Targets for Primary Building Systems

Purpose: Recognizing that "disruptive technologies" may emerge and radically change conventional wisdom about building systems design (i.e. the impact of the computer upon office environments), new buildings will be designed to maximize the longevity of their systems.

Strategy: Ambitious targets for primary building systems that reflect designing for durability, low maintenance, and life-cycle cost benefits.

- Structural systems: 500 years
- Mechanical systems: 40 years
- Plumbing systems: 150 years
- Roofing systems: 50 years
- Building envelope: 150 years
- Electrical systems: 50 years

Action: Feasibility study to determine the cost-benefits of this approach.

Action: If feasible, development and implementation of durability protocols for building systems in the Toronto waterfront.

Air Quality

Goal: Minimize pollutant emissions on the Toronto waterfront to help improve air quality in the City and throughout the region.

Rationale

Poor air quality has a dramatic effect on quality of life in the city, especially during the summer months, and can negatively affect plant, animal, and aquatic habitat. Air pollution includes ground-level ozone, carbon monoxide, nitrogen oxides, sulphur dioxide and small particulates that can be inhaled and cause irritation to the respiratory tissues. A recent report by Toronto Public Health estimated that five common air pollutants contribute to about 1,700 premature deaths and 6,000 hospital admissions in Toronto each year[19].

Air quality is directly linked to energy and transportation choices. Fossil fuels are by far the current favoured energy source for transportation as well as for space heating, cooling, and lighting for all industrial, commercial, and residential purposes. The use of fossil fuels is fundamentally unsustainable since not only are they major sources of air pollution but they are also finite natural resources that will eventually be used up.

Current Conditions

Air quality studies[20] completed as part of the City of Toronto's Waterfront Scan and Environmental Improvement Strategy indicated high concentrations of particulate matter in all areas of the City including the waterfront. Other air pollutants found in significant quantities throughout the City include nitrogen oxide (primarily due to transportation), sulphur dioxide (primarily from industrial activities), volatile organic compounds, and carbon dioxide (both from energy production for electricity, heating and cooling and from transportation).

The original sources of air pollution are local, immediately upwind, regional (50-200 km) and long range (200 km and up, including transboundary). Under certain climatic conditions, significant amounts of smog in Toronto come from distant

[19] Toronto Public Health 2004 **Air Pollution Burden of Illness in Toronto**.

[20] City of Toronto Works and Emergency Services (2001). *Air Quality Study* prepared by Rowan, Williams Davies and Irwin 2001.

sources in the US,[21] because of prevailing patterns of wind and atmospheric temperatures. The remainder is a direct result of the combustion of fossil fuels by cars, trucks, motorized equipment, and to produce energy for heating, cooling, and lighting. The table below summarizes factors affecting the waterfront's air quality.[22]

Universal factors affecting air quality	Atmospheric stability, wind speed and direction, temperature, precipitation, mixing height (height at which pollutants will be mixed throughout the City)
Additional factors affecting air quality on the Toronto waterfront	Heat island effect (natural vegetation replaced by heat absorbing materials), lake breezes, surface roughness due to large collections of buildings, buildings with short stacks resulting in pollutant emissions being quickly brought to ground level, street canyons trapping pollutants

Detailed information on current air quality on the Toronto Waterfront can be found in Section 3.4 Atmospheric Environment. *TWRC Environmental Framework, Volume 2: Existing Conditions.*

Sustainability Response

A sustainability response to air quality is strongly linked to energy use along with land use and infrastructure planning.

Complementary benefits of reduced greenhouse gases, smog precursors and toxic air pollutants will be achieved through the TWRC's initiatives on energy, transportation and land use. Ultimately, the waterfront's influence on Toronto's air quality will depend on the degree to which fossil fuel use can be avoided.

The Toronto waterfront will address poor air quality by encouraging energy efficiency and the use of alternatives to fossil fuels for heating, cooling, light and transport. This approach will be supplemented and implemented through activities such as mixed use planning and alternatives to auto use, controlling pollutant and particulate

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[21] Cited in City of Toronto (2000) *Environmental Plan.*

[22] City of Toronto (2003) *Waterfront Scan & Environmental Improvement Strategy Study: Opportunities from Past to Future.* Environmental Services, Technical Services Division. Works and Emergency Services.

emissions from construction and post-construction, developing partnerships with industry and research organizations to find ways to reduce emissions and track carbon off-sets, and building a reasonable tree canopy to improve air quality and enhance biodiversity and community liveability. Goals and targets in the energy and transportation, land use and materials and waste sections of this framework are strongly related to this category of impacts.

Objective: Reduce concentrations of the air pollutants that contribute to smog

NOTE: *Reducing smog has strong links to several additional strategies and actions listed under other themes particularly Transportation, Energy and Human Communities*.

Strategy: Mixed use planning to minimize car use.

Action: Situate basic shopping needs and personal services within walking distance of residential units.

E1.Target: All residential units within 350m of basic shopping needs and personal services.[23]

Strategy: Increased control of polluting emissions during Smog Alert days.

Action: Adopt a set of smog alert protocols for the Toronto waterfront for construction and post-construction phases. The protocols should complement the smog alert response plan already in place for City of Toronto operations.

[23] South East False Creek, Sustainability Policy Vancouver, British Columbia

Objective: Minimize dust from construction and demolition activities

Action: Adopt a set of demolition and construction dust control protocols for the Toronto waterfront.

Objective: Purify air and add beauty and comfort on site

Strategy: Expand tree canopy

Action: Develop landscaping plan to provide shade in summer and wind resistance in winter.

 **E2.Target:** 30-35% coverage of site with trees.

Action: Develop tree maintenance protocols to ensure sustained tree growth.

Human Communities

Goal: Vibrant welcoming healthy and inclusive waterfront communities

Rationale

Sustainability a process of creative, local, balanced decision-making that continues to adjust to changing realities

Communities with a high quality of life are desirable places to live, work and do business. Sustainable communities are characterized by a clean environment, a resilient economy and strong sense of social-well being throughout the population. A sustainable community supports and encourages diversity and takes long-term and external impacts into account during decision-making. Strengthening sustainability within a community often begins with a clear vision but it is really a process of creative, local, balanced decision-making that continues to adjust to changing realities of community and urban living.

The revitalization of the Toronto's waterfront will add a number of amenities – cultural, entertainment and recreational facilities, park, live-work neighbourhoods – which in turn will make the City a more desirable place to live and work and, by extension, conduct business.

TWRC Development Plan and Business Strategy 2003

Current Conditions

The waterfront currently has pockets of community with large tracks of under-used or contaminated lands. Most of the area is separated from the rest of the City by major transportation corridors and the majority of housing along the waterfront is high-end real estate. Because it is the location of seemingly abandoned lands, it has also become a place where a number of homeless people live.

Accessibility to the lake and lakeside facilities is a problem along the waterfront. Harbourfront Centre located in the central waterfront area is a cultural centre that introduces Toronto audiences to artists and art forms that would not normally be seen in commercial venues. It attracts over 12 million visitors a year. However, a recent report indicated that there are people living in the City of Toronto who have never visited the

waterfront, among them a significantly large number of children.[24]

Sustainability Response

The most successful cities are those with a high quality of life

Pursuing the development of sustainable communities on the Toronto waterfront will ensure that the waterfront is transformed into a place where people from all backgrounds and ages can live, work, play, visit, and learn in a way that strengthens and celebrates the beauty, the diversity, the economic vitality, the opportunities, the creativity, the heritage, and the natural environment of the City of Toronto and the GTA. Sustainability communities will also attract a mix of people to the waterfront including adults with children, seniors, New Canadians and those from all economic backgrounds

A sustainable approach to community development includes dramatically improving access to the waterfront, improving and maintaining attractive, environmentally sound parks, open spaces and recreational opportunities, stimulating mixed use development that provides housing options for a wide variety of living arrangements and pocketbooks, and creating small- and medium-scale commercial opportunities and diverse employment options.

[24] Toronto Star, January 2004

Each sustainable community is notable for one or more unique characteristic or innovation. The Toronto waterfront has already been identified as suitable location for an urban research centre and an international university for peace studies. The sustainability showcase examples found throughout the framework provide an indication of the type of features that might help make Toronto a leader in sustainable community development but more will become apparent through the application of sustainability principles to all aspects of revitalization.

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Creativity & Innovation

Strength through Diversity

Objective: Waterfront communities that attract people year round

Strategy: Enhanced recreational features.

Action: Create and maintain green and open space that is suitable for a wide range of recreational activities and park land.

F1.Target: 25% of waterfront area devoted to new and improved parks and open spaces (over 200 hectares).

Action: Implement strategies to clean up waterfront beaches.

F2.Target: At least eight waterfront beaches meeting Blue Flag certification for water clean enough to swim in by 2008.

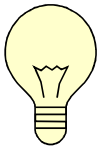
Blue Flag Program

The Blue Flag is an exclusive eco-label awarded to beaches meeting certain environmental criteria. More than 2,800 beaches and marinas across Europe, South Africa and the Caribbean have been given a Blue Flag designation.

Environmental Defence Canada is the Canadian National Operator of the Blue Flag Program and is responsible for developing Canadian Blue Flag Criteria, assessing beaches for Blue Flag status, and promoting the benefits of achieving Blue Flag certification. All Blue Flag National Operators are members of the Foundation for Environmental Education (FEE).

Action: Develop winter recreational programs across the Toronto waterfront.

Action: Create extensive year round walking, biking, fishing, and boating opportunities.

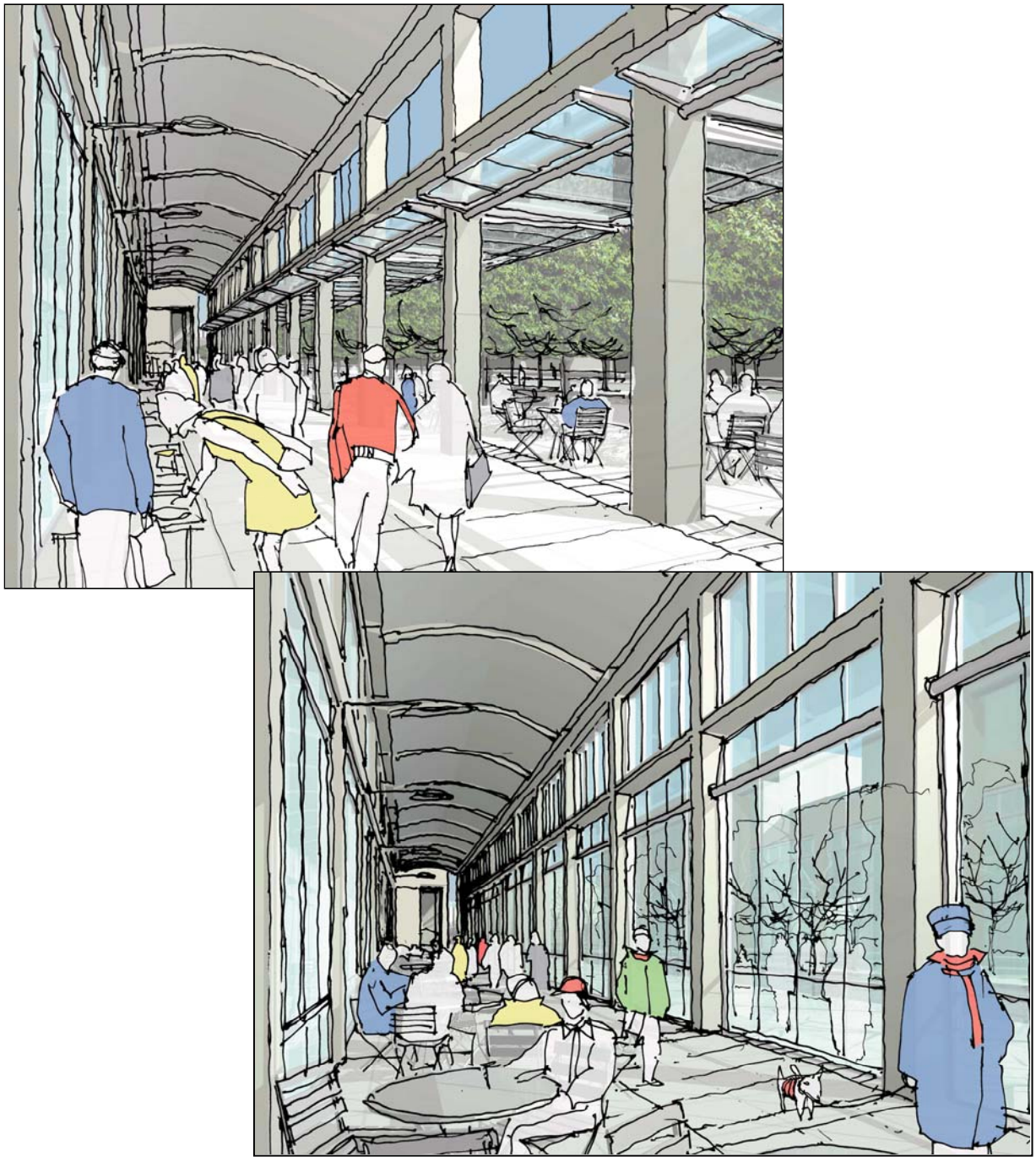


Sustainability Showcase

Year Round Covered Walkways

Louvered, covered walkways that open and close depending on climate, that allow views of the lake, that are secure and that are operated, lit and heated, when necessary, through energy-efficient means will provide environmental, social and economic benefits to waterfront revitalization. This feature brings the potential for improvements to public health through increased opportunities for recreational walking throughout the year and contributes to reduced car use. It will also strengthen community vibrancy by attracting residents and visitors alike to the waterfront summer, spring, winter, and autumn.

The micro-climatic protection and general urban enjoyment provided by this louvered walkway are intended to form a comprehensive walkway system, linking the major districts of East Bayfront and providing ready connections between water's edge residences, workplaces, shopping, community services, and the transit systems. It represents a very practical way of moderating the sometimes severe weather conditions of the lakefront and will naturally invite people to use the most sustainable form of transportation – walking



Artist's rendition of Louvered Walkway on the Toronto Waterfront—open in warmer weather (above); closed in cooler weather (below)

Objective: A place to live for people from all walks of life throughout the life cycle

Strategy: A diverse housing mix and related community services.

Action: Include appropriate housing to support all age groups and families of all types, sizes, and economic levels.

Action: Build or enhance the appropriate number and type of community services including outdoor play areas, community centers, elementary and secondary schools, daycares, and libraries.[25]

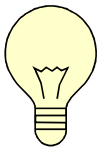
F3.Target: 25% of new residences targeted for affordable housing (5% low end).[26]

Objective: Appropriate mix of residential and commercial space

Strategy: Draw small, medium, and large businesses to the waterfront.

Action: Market the business benefits of being part of a sustainable waterfront community. Target businesses and corporations that have demonstrated interest in the sustainability concept.

F4.Target: At least 25% of space is commercial space.



Sustainability Showcase

Internet Shopping Link with Local Businesses[27]

Encourage residents to support local business by providing an internet shopping link. Encourage businesses to do any related delivery of goods by non- or low-polluting transportation (e.g. bicycles, walking).

[25] Facility and site requirements and location criteria as outlined in the City of Toronto Central Waterfront Plan[9]

[26] City of Toronto, 2003. Policy direction contained in the City of Toronto Central Waterfront Plan.

[27] BedZED, Beddington England

Objective: A peaceful and relaxing environment

Strategy: Minimize noise and light pollution.

Action: Develop and implement a noise control strategy.

F5.Target: Ambient noise levels of 45 dB (A) in residential areas.

Action: Develop and implement a strategy to minimize direct light beams directed beyond site boundaries or upwards without falling entirely on a surface for the purpose of illuminating that surface[28] (this has a link to the Natural Environment theme since it would need to be designed to also minimize bird strikes of buildings).

Objective: Community involvement in growing healthy nutritious food

Strategy: Community gardening

Action: Creation of community gardens throughout waterfront communities. Identify and make available public plots of land that are suitable for food growing adjacent to or on residential and community development by 2004.

Action: Encourage organic farming/gardening methods.

Action: Establish a healthy food/local market café by 2007.

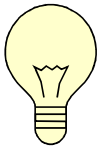
F6.Target: All new residential buildings will incorporate roof gardens, balcony gardens, and/or community gardening plots.[29]

Objective: On-site availability of cuisine from all regions of the globe

[28] ESD Guide Melbourne Docklands

[29] City of Vancouver 2003 Performance Criteria for Southeast False Creek, Percentage of total neighbourhood roof area designed to carry plant life.

Objective: Learn more about sustainability in action



Sustainability Showcase

Sustainable Living Learning Centre

Create a Sustainable Living learning center with across-site accessibility to functioning sustainability features aspects such as innovative infrastructure and ecological systems. Public art and sustainability education will be combined with park space, including an ecology information centre.[30]

[30] City of Vancouver, Southeast False Creek; Harmony Sjostad, Stockholm.

Cultural Resources

Goal: A high level of cultural vibrancy and creativity

Rationale

A strong commitment to cultural vibrancy goes hand-in-hand with support for the arts, recreation, cultural heritage, festivals, services, sports and street activities. An engaging waterfront is an attractive and stimulating place to visit, live and work, brings many different benefits to the community, the City and region and welcomes and enables all people to fully participate in City life.

Current Conditions

The City of Toronto Cultural Plan for a Creative City outlines the City's current cultural strengths and weaknesses and proposes measures for enhancing cultural assets.[31] The cultural facilities database indicates that there are more than "750 art galleries, museums, libraries, community centres, assembly and concerts halls, school auditoriums and churches, either publicly or privately owned" throughout the city. New facilities such as the still -under -construction Opera House and the extensive renovations now underway at the Royal Ontario Museum and the Art Gallery of Ontario are evidence of renewed interest in cultural resources among provincial and federal funding agencies as well as among individual and corporate donors.

On the waterfront, Harbourfront Centre remains an important cultural focus with an art gallery, year round indoor and outside community programs and festivals, entertainment venues and arts education facilities. The waterfront also has a rich cultural heritage with areas of historic significance and other cultural features requiring preservation and enhancement.

Sustainability Response

Cultural priorities and the wise management of cultural resources on the waterfront need to be incorporated into many aspects of waterfront revitalization. Integrating cultural considerations into activities such as land use planning, the design of parks, public space and buildings, ensures the creation an attractive mix of features that draw people to the

[31] City of Toronto 2003. Cultural Plan for the Creative City.

area year round and contribute greatly to the likelihood of achieving an overall beautiful natural and built environment on the waterfront.

Integrating cultural considerations into revitalization requires understanding the cultural opportunities that exist in the near and longer terms as well as protecting and enhancing cultural heritage resources that are already in place.

Sharing the Benefits: NET PLUS™

Urban Cottage

Creativity & Innovation

Strength through Diversity

Objective: Maximize cultural resources on the waterfront

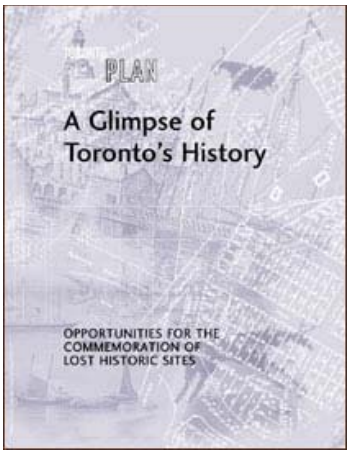
Strategy: Incorporate cultural features and activities throughout the waterfront[32].

Action: Create a visual identity program including public art and interpretive resources.

Action: Create cultural and heritage destinations on a variety of scales.

Action: Strengthen connections between the waterfront and the city through historically and/or culturally significant corridors.

Action: Support artistic and cultural expression in new buildings, new infrastructure, in urban ecological processes and in green and open spaces.



Objective: Protect and enhance existing cultural and heritage resources, including built heritage

Strategy: Understand the nature and extent of existing waterfront built and cultural heritage and archaeological resources and how they can be integrated as part of sustainable community development.

Action: Develop an inventory and map of cultural heritage resources along the waterfront, and ensure the inventory is reviewed for relevance to each waterfront initiative.

[32] The actions under this objective are taken from City of Toronto 2001 Waterfront Cultural and Heritage Infrastructure Plan.

Action: Develop an operational strategy for integrating cultural heritage resources into planning and design for site, buildings and infrastructure using approaches such as restoration, adaptive re-use and public art (see example of the objective *to celebrate the waterfront setting* under the Water theme).

Objective: Maximize cultural activities

Strategy: Provide a wide range of opportunities for cultural activities and facilities.

Natural Heritage

Goal: Greatly enhance the environmental integrity of the Toronto waterfront

Rationale

The health of the local ecosystem has profound implications for the ultimate sustainability of local communities and the City and region as a whole. Many issues relating to this theme are covered in other parts of the framework, including air quality and water.

Polluted soil, air, and water pose health risks and are strong obstacles to building vibrant communities. Degraded habitats and invasive plant monocultures reduce the viability of area ecosystems over the long term and detract from the natural beauty that would attract people to the waterfront to live, work and play. As well, an enhancement or expansion of the current natural heritage promotes a more natural water cycle, enhances biodiversity and provides greater opportunities for recreation and a higher quality of life than paved and other water impervious ground cover.

Prior to settlement of the Toronto area, the shoreline was very different from the one we know today. Rivers and creeks supplied clear, cool water and provided habitats for river-spawning fish such as salmon. Nutrient-rich estuaries supported wetlands teeming with wildlife. Sandy spits provided protection from winds and wave action. Sheltered stretches of shoreline were lined with lush stands of emergent vegetation. Much of the nearshore was covered with sand, gravel and stone (Whillans, 1999).

Current Conditions

The original shoreline at the time of European settlement in the Toronto area has been almost completely eradicated do to development activities beginning in the 1800s. Much of what is known as the waterfront today is land created by the placement of lakefill over many years.

The Toronto waterfront was identified as an "area of concern" by the Federal Government in 1987 and has been the focus of a remedial action plan (RAP) since that time. Noted problems include restriction on the consumption of fish and wildlife, loss of fish and wildlife habitat, beach closures, degradation of aesthetics resulting from conditions such as contaminated stormwater and degradation of natural landscapes.[33]

For detailed information on the Toronto waterfront's natural heritage, refer to TWRC 2003 Environmental Framework Volume 2: Existing Conditions.

Sustainability Response

Measures will be taken to restore and enhance aquatic and terrestrial habitat including creating favourable conditions for migratory birds with an emphasis on high quality habitat restoration.

Setting high targets for habitat improvement will strengthen biodiversity and focus attention on the value of these natural assets. Restored and enhanced aquatic habitats will allow renewed opportunities for sustainable use of fishery resources.

A reasonable goal would be to introduce biodiversity[34] into waterfront areas using regionally appropriate flora and fauna. Native plant species are an excellent choice because they generally require much less water to thrive and because they do not introduce the risk of ecosystem disruption that can accompany the introduction of non-indigenous plant species. Appropriate ecosystems for the waterfront would be wetland or Carolinian.

Sharing the Benefits: NET PLUS™

Urban Cottage

Strength through Diversity

[33] Toronto and Region Conservation Authority (2004) Toronto Waterfront Aquatic Habitat Restoration Strategy.

[34] A measure of the diversity of species living in the environment as a whole and within a given interacting environment known as an ecosystem. United Nations convention on Biological Diversity (1992).

Objective: Extensive habitat improvement

Strategy: Restore and enhance natural communities in accordance with soil, topographic and hydrologic conditions

Action: Implement the recommendations for improving the ecological health of the shoreline contained in the Toronto Waterfront Aquatic Habitat Restoration Strategy (TWARHS)[35] including improving water and sediment quality, re-introducing top predators such as muskellunge and walleye and increasing structural diversity across the waterfront.

Action: Protect and restore the habitat for all wildlife, including migratory birds.

Action: Create and maintain networks of green space throughout the waterfront as identified in the Toronto and Region Terrestrial Natural Heritage System Strategy (TNHSS)[36].

H1.Target: Restore terrestrial habitats in accordance with priorities identified in TRCA's TNHSS.

H2.Target: Apply habitat restoration techniques in accordance with the Habitat Plan set out in accordance with TRCA's TWARHS.

Objective: Strengthen native biodiversity

Strategy: Ground cover with a diversity of indigenous plant species.

Action: Identify native plants most suitable for waterfront revitalization.

Action: Ensure a mix of plant species, avoiding the creation of monocultures.

H3.Target: 80% of all restoration plantings on publicly owned gardens and landscape areas are native to Southern Ontario.[37] Remaining 20% must be non-invasive species.

[35] Toronto and Region Conservation Authority 2004 Toronto Waterfront Aquatic Habitat Restoration Strategy.

[36] Toronto and Region Terrestrial Natural Heritage System Strategy. TRCA draft April 2004.

Objective: State-of-the-art integrated soil management

Strategy: Safe and effective management of contaminated soils.

Action: Implement the TWRC's Integrated Groundwater Management Soil Strategy.

37 ESD Guide Melbourne Docklands

Water

Goal: Improve water quality along the Toronto waterfront and reduce per capita consumption of fresh water.

Rationale

Excellent water quality is a vital component of a sustainable community since it essential for human health and the health of the ecosystem as a whole. Conservation of fresh water is also important since, even in urban centres like Toronto that have a good supply of fresh water, it requires energy and other resources to deliver treated water to homes, businesses and industries.

Current Conditions

Toronto's drinking water quality remains high but the huge volume of stormwater that enters sewers during heavy storms temporarily exceeds the sewer capacity causing them to overflow. This creates havoc with water quality in lakes and streams as the runoff picks up and then deposits pollutants such as heavy metals, organic chemicals, bacteria and phosphorus.[38]

The International Joint Commission , responsible for Implementing the Great Lakes Water Quality Agreement between Canada and the United States, has identified Toronto's waterfront has "an area of concern" due to poor water quality and related impacts such as fish and wildlife habitat loss and disruption and the frequent closing of beaches.

The City of Toronto's new Wet Weather Flow Management Master Plan emphasizes that much of the runoff that eventually enters the lake at Toronto's waterfront is from areas outside the City, a reflection of the natural watershed setting in which the City is located. The Wet Weather Flow Management Master Plan also lays out a series of steps that can be taken to improve water quality in the City of Toronto. These steps are reflected in the goals and targets outlined below.

Contaminated sites on the waterfront also pose a threat to groundwater quality especially if disrupted during the revitalization process.

[38] City of Toronto 2000 Environmental Plan

For further information on Toronto's water quality and quantity, refer to TWRC's Environmental Framework Volume 2: Existing Conditions.

Sustainability Response

The Toronto waterfront will be the demonstration city for the conservation, integration and sustainable innovation of waterfronts and water resources. The aim is to takes steps that will support the improvement of water quality on the waterfront while sharing the benefits of improved water quality with Toronto and the GTA as a whole. The waterfront will be clean, healthy and safe for recreation including swimming. The Toronto and Region Remedial Action Plan is an important source for building a sound response to some of the major sustainability challenges posed by under the water theme.

The Toronto waterfront will also pursue revitalization in a way that maximizes the opportunities for the conservation of drinking water. Freshwater will be preserved and respected as a precious resource and will not be widely used for purposes where waste water (also known as grey water) would be a safe and effective alternative.

The Toronto waterfront will also be foremost in the development of elegant waterfront architecture, water art and green building and open space design.

Sharing the Benefits: NET PLUS™

Urban Cottage

Feels Like Home

Creativity & Innovation

Strength through Diversity

Objective: Contribute to improved water quality in the lake

Strategy: Reduce likelihood of contaminants entering the lake.

Action: Implement measures help absorb rainwater such greenroofs (see Target G6), widespread greenspace, permeable surfaces, rain gardens, and, where necessary, surface gutters routing water to rain gardens.[39]

Action: Institute best practice guidelines for the control of herbicides; salt; animal waste and other pollutants.

Action: As permeable surfaces increase, build proposed tunnel to collect stormwater runoff for treatment prior to discharge.

Action: Reduce the quantity and improve the quality of stormwater runoff by implementing the recommendations of the City of Toronto Wet Weather Flow Management Master Plan(WWFMMP). This includes:

1. As a priority, rainwater (including snowmelt) should be managed where it falls on the lots and streets of the city, particularly before it enters a sewer.
2. Wet weather flow should be managed on a watershed basis with a natural systems approach being applied to stormwater management as a priority.
3. A hierarchy of wet weather flow solutions should be implemented starting with at source, then conveyance, and finally end-of-pipe.
4. Toronto's communities need to be made aware of wet weather flow issues and involved in the solutions.

Objective: Reduce use of potable water

Strategy: Increase the use of rainwater and greywater.

Action: Capture stormwater and reuse on-site.

Action: Design and implement an integrated water management plan that relies on the use of clean stormwater

[39] Malmo Sweden

and available greywater for toilet flushing and other uses where drinking water quality is not essential.[40]

I1.Target: Set target for per capita consumption of potable water at 150 litres per person per day residential[41]; 25 litres per person per day commercial water consumption.[42]

Action: Encourage use of dual flush toilets and installation of water-conserving appliances.

Objective: Protect groundwater from contamination

Strategy: Minimize risks from contaminated sites.

Action: Implement the TWRC integrated soil and groundwater management strategy.

Objective: Celebrate the waterfront setting and water as a feature

Strategy: Encourage artistic expression using water as theme and incorporate art as an integral part of building sustainability components.

Action: Design and install distinctive pieces of water art along the waterfront.

[40] BedZED, Beddington England

[41] Township of King already averages 196L/capita/day for residential use.

[42] York Region already averages 30L/capita/day for commercial use.

Action: Organize a local and international design competition and seek sponsors to ensure water art is a distinguishing feature of the Toronto Waterfront.

Materials and Waste

Goal: Significantly reduce per capita waste production over current levels and minimize the use of resources for production of building and other materials.

Rationale

Waste production places a burden on the natural ecosystem and is a major contributor to the pollution of air, water, and land. The production of waste goes hand-in-hand in with the manufacture and use of materials.

Current Conditions

At the beginning of the twenty-first century, the City of Toronto does not have access to a local landfill site so all non-recyclable waste is transported to the State of Michigan. The City has set the target of 100% diversion from landfill by 2010.

Sustainability Response

Integrated waste management is a process designed to “close the loop” on resources, with strategies to minimize the use of materials and systems for recycling or reusing all waste materials. The Toronto waterfront will demonstrate the highest standard of efficient resource and non-toxic materials use.

Sharing the Benefits: NET PLUS™

Urban Cottage

Feels Like Home

Objective: Waste reduction

Strategy: Set per capita waste reduction targets.

Action: Provide area residents with information on waste reduction strategies.

J1.Target: Per capita waste disposal targets of 200kg/person/year.[43]

Objective: Re-use and recycling

Strategy: Choose salvaged or recycled materials over new ones, and re-use building components and existing systems where safety and suitability permit.

Action: Implement the TWRC's construction and demolition materials management strategy.

Action: Establish a temporary on-site recycling facility to handle construction materials. Include opportunities for the public to purchase materials not needed for construction.

J2.Target: 75% of lumber from sustainable plantations or recycled sources.[44]

J3.Target: 25% of building materials from recycled or renewable sources.

Objective: Local economic development

Strategy: Buy from local suppliers.

Action: Compile a directory of businesses within a hundred kilometre radius of Toronto selling sustainable products.

[43] City of Vancouver, Southeast False Creek
[44] ESD Melbourne Docklands

Objective: On site containment of waste

Action: Establish facility for on-site composting of organic waste

- Develop protocols for transferring compost to community gardens and parks throughout the waterfront.
- Make compost easily available to all waterfront residents.

Action: Import waste from other parts of the City as capacity allows.

J4.Target: zero transport of leaves and organic waste from the Toronto waterfront.[45]

Objective: Avoid use of materials and compounds that create health or environmental risks during production, use or disposal

Strategy: Minimize use or production of hazardous waste during revitalization activities.

Action: Establish protocols for limiting the use of chlorinated solvents, and solvent-based paints in the first five years of revitalization (2005 – 2010) with the possibility of long-term phase out of the use of all hazardous substances.

Action: Produce an information guide on product substitution of non-hazardous products for hazardous materials.

Action: Conduct an annual hazardous waste audit to evaluate hazardous waste levels and find new opportunities for substitutions.

[45] City of Vancouver, Performance Criteria for Southeast False Creek

Innovation

Goal: To encourage innovation as a means to make the Toronto Waterfront the foremost example of sustainability and a centre for creativity and knowledge.

Rationale

Innovation is a way to change negative practices and patterns and support a shift to a more sustainable way of doing things. Innovation also offers the promise of exciting economic, social, and environmental benefits for the Toronto Waterfront communities and, potentially, for the region, the province, and the country as a whole. Creating an environment where innovation is encouraged and celebrated will attract those in the creativity and knowledge industries as well as increase interest among investors.

Sustainability Response

The Toronto waterfront will be a network of fully connected communities with the flexibility to take advantage of future advances in technology.

All facets of waterfront development will pose challenges and opportunities for innovation as those involved in activities such as planning, design, construction, and maintenance take steps to incorporate sustainability principles into their efforts. As well, providing a rich and diverse cultural and learning environment coupled with ease of formal and informal interaction increases the likelihood of all types of innovation – technological, artistic, and lifestyle – springing to life on Toronto's waterfront.

Sharing the Benefits: NET PLUS™

Creativity & Innovation

Strength through Diversity

Objective: Stimulate creativity and innovation

Strategy: Incentives to be innovative.

Action: Establish a waterfront "innovation in sustainability" recognition program.

Recognize:

- Design that contains original and innovative technology
- Design that uses existing technology in an original way
- Design that can be replicated and marketed elsewhere
- Design that uses recognized sustainable design specialists in design process (include copies of reports and recommendations)
- Design developed from multi-disciplinary or community participation
- Innovative financing or partnership performance contracts (e.g. in areas such as energy)

Objective: Bring attention to Toronto waterfront's sustainability achievements and potential

Strategy: Promotion of the Toronto waterfront as a centre for innovation and creativity.

Action: Begin compiling inventory of all innovative activities on the waterfront in 2004. Document with photographs and video and promote at local, national and international events.

Action: Hold a biennial international conference and exhibition on innovation in sustainability.

Objective: Ability to accommodate important technological advances

Strategy: Flexibility platforms in new buildings and infrastructure (see section on Sustainable Buildings).

SECTION 4

WHAT THE TWRC WILL DO

SECTION 4

What the TWRC Will Do

The TWRC will take the necessary steps to ensure that revitalization of the Toronto Waterfront results in Toronto becoming a world leader in sustainability. This is a long-term undertaking that requires partnerships of all types – with the private sector, with all levels of government, and with members of the general public. Success will depend on integrating sustainability principles from the very beginning and also on an unflagging commitment to realizing sustainability aims over several decades.

The TWRC will begin to carry out the actions presented in the Sustainability Framework once consultation is complete and, as a result, priorities have been decided. The scope and pace of implementation will be modified as new information and technologies become available but the overall direction will be towards greater sustainability.

The effectiveness of the framework in delivering on the TWRC's sustainability vision and outcomes will be evaluated from time to time and revisions will be made, as necessary. On-going monitoring will allow the TWRC to report out on an annual basis on progress towards desired outcomes.

Incorporate Sustainability into Management and Operations

To assume leadership in sustainability, the TWRC must lead by example and conduct its business in a manner consistent with sustainability principles. For example:

Leadership

Where possible, the TWRC will take the lead on initiating outstanding sustainable development projects such as state-of-the-art sustainable buildings or new forms of community engagement in decision-making.

Innovative Approaches

The TWRC will support sustainability by exploring options to conventional large-scale, top-down commercial development processes. Examples of alternatives include:

- coordinated development of several sites within a designated area to promote diversity;
- sale of land to individual households or syndicates of households or not-for-profit agencies that will conform to strong sustainability standards, or
- accepting a less than market return on land in exchange for achieving higher sustainability performance.

Accountability and Reporting

The Corporation will establish protocols for monitoring, evaluating, and reporting on progress towards sustainability outcomes. A summary of progress will be reported annually.

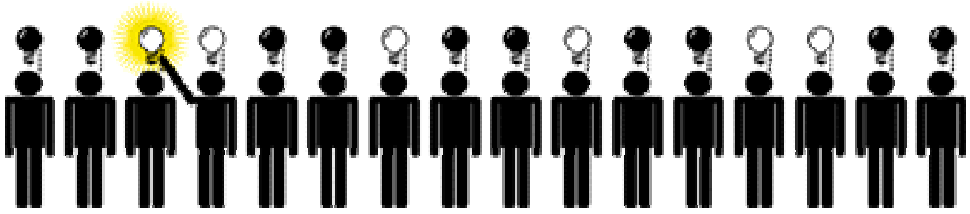
Each project manager will be asked to indicate at the beginning of the project and each subsequent year how their project conforms to the sustainability framework. See Appendix 4 for a sample format.

Procurement Policy

The Corporation will include sustainability as an important component of its procurement policy including:

- Primarily choosing products that have fewer impacts on the environment, such as recycled paper and non-toxic inks

- Using understanding and experience of applying sustainability principles as a key criterion for evaluating proposals and choosing consultants



Hiring Practices

All job descriptions will include a statement of the importance of sustainability to the Corporation. All job advertisements will list a demonstrated understanding of sustainability principles among the preferred attributes of the ideal candidate. All new employees will be given a copy of the TWRC's Sustainability Framework as part of orientation.

Recycling

The office of the TWRC will provide facilities for recycling paper, cans, and bottles and, when possible, organic waste.

Office Supplies

The TWRC will use recycled paper or paper made with Forestry Stewardship Council certified fibre and board for 90% of all TWRC correspondence and documents.

Building Capacity for Implementing Sustainability

The Corporation will provide sustainability training for all project managers and the senior management team. An interactive online introduction to sustainability and the TWRC's Sustainability Framework will be loaded onto the TWRC's website and all employees and associated consultants will be encouraged to use it.

Collaboration

Since sustainability requires taking creative new directions by working across areas of expertise, all project managers with different responsibilities within a program will be encouraged to hold occasional sustainability review meetings to share insights into sustainability achievements and to resolve sustainability challenges.

Partnerships

Sustainability relies on innovative partnerships and the TWRC will pursue partnerships with a wide range of organizations and agencies including, but not limited to, government, business, non-governmental organizations, financial organizations, investors, the scientific and research communities, the arts and media communities, youth and senior organizations, community groups, and waterfront agencies in other parts of the globe.

Promote and Support Sustainability

The TWRC will support sustainability in a variety of ways with the goal of attracting those interested in participating in the sustainability challenge and educating others about the value of the approach.

Marketing

The TWRC will develop marketing materials that promote the benefits of sustainability to different audiences including developers, the construction industry, potential waterfront residents, investors, and the general public.

Web Site

The TWRC will establish a robust web site dedicated to the public's access to information relevant to the sustainable development of the Toronto Waterfront. Visitors will be able to access a wide range of information: climate data, environmental-footprint calculations, and the graphic representation of existing and projected flows of energy, water, and waste. Also included will be "how to" guides for residential and commercial occupants, links to global information resources, web cams to key sites on the Toronto Waterfront, and background reports and technical guidelines relevant to Toronto Waterfront sustainability

Sustainability Handbooks

The TWRC will provide a detailed technical handbook for each major revitalization activity. Each handbook will contain step-by-step guidelines for relating sustainability themes, objectives, actions, and targets to activities, such as brownfields remediation, building design, and infrastructure planning.

Educational Exhibits

The TWRC will assist developers and owners with the creation of educational exhibits and/or materials to inform occupants and visitors about sustainable design features of new buildings. Working with educational institutions, the Corporation will ensure that the information across the waterfront is geared to a range of ages and technical interest in sustainability.

Sustainability Tenant Manual

Each commercial or residential occupant will receive a *Sustainability Tenant Manual* that provides guidance on energy-saving strategies, energy-efficiency features to the building, renewable and district-wide energy options, and general information about why sustainability is an important issue at the Toronto Waterfront. Each *Sustainability Tenant Manual* will include a current resource guide for ecologically sound products and services.

Pilot Projects

The corporation will seek partners and funding to develop leading-edge sustainability projects.

Media Activity

The TWRC will sponsor the publication of a minimum of four distinct articles/op-ed pieces per year on aspects of sustainability at the Toronto Waterfront. These articles will target the Toronto-area newspapers, waterfront magazine, the TWRC web site and local on-line news services.

Progress on sustainability objectives will be documented in video, edited, and made available as an educational tool to schools and other interested groups.

Apply for Awards

As the sustainability outcomes begin to take shape, the TWRC will apply to national and international award programs for recognition of achievements and to share lessons learned.

APPENDICES

APPENDIX 1

Overview of Sustainability Objectives and Targets

Theme	Objective	Target
Energy	High levels of energy efficiency	**A1** all new buildings designed to be greater than 50% efficiency than MNBEC between 2005-2007; 60%. Efficiency than MNBEC 2008 onwards **A2** all new buildings designed between 2005-2007 will incorporate measurement and verification components
	Increase percentage of energy consumption from renewables	**A3** 20% of energy from on-site renewable sources by 2010. **A4** Purchase 30% of electricity needs from low-impact renewable energy by 2010; increase that to 80% by 2020
	Reduce per capita greenhouse gas emissions associated with energy production	**A5** 50% of businesses engaged in tracking carbon credits. **A6** 40% less CO_2 emissions per capita than current average by 2025.
Land Use	Development patterns consistent with sustainability	Actions only
	Vibrant street life	Actions only
	Maximize opportunities for use of renewable energy	Actions only
	Enhanced animal and aquatic habitat	Actions only
	Compatibility between designated land uses and sustainable infrastructure	Actions only
	Recapture value of abandoned and under used sites	Actions only

Theme	Objective	Target
Transportation	Minimize car use	**C1** 1300 kilometres driven per capita per year for waterfront residents **C2** All residences within 350m of a LRT, street care or bus stop
	Increase walking, cycling and public transit use	**C3** one bicycle storage space or parking space per 100m2 residential space. **C4** six bicycling parking spaces and one show per 1000m2 commercial space **C5** 75% of children living and attending school on-site using alternatives to cars and buses for travelling to school
Sustainable Buildings	More sustainable buildings	Actions only
	High-performance sustainable building systems	**D1** All new buildings designed between 2005-2007 will conform to LEED gold certification; consideration will be given to all new buildings conforming to LEED Platinum from 2008 onwards.
	Building sites that maximize sustainability opportunities	Actions only
	Buildings that are compatible with a high quality of life in associated communities	Actions only
	Long life for buildings and related structures	Actions and showcase only
Air Quality	Reduce concentrations of ground level ozone	**E1** All residential units within 350m of basic shopping needs and personal services
	Minimize dust from construction and demolition activities	Actions only
	Purify air and add beauty and comfort on-site	**E2** 30-35% coverage of site with trees
	Reduce airborne emissions of VOCs due to disturbance of contaminated soil	Actions only
	Avoid production of hazardous waste	Actions only

Theme	Objective	Target
Human Communities	Waterfront communities that attract people year round	**F1** 25% of waterfront area devoted to new and improved parks and open space (over 200 hectares) **F2** At least eight waterfront beach meeting Blue Flag certification by 2008
	A place to live for people from all walks of life, throughout the life cycle	**F3** 25% of residences targeted for affordable housing (5% low end).
	Appropriate mix of residential and commercial space	**F4** at least 25% of space is commercial space.
	A peaceful and relaxing environment	**F5** Ambient noise levels of 45 dB(A) in residential areas.
	Community involvement in growing healthy nutritious food	**F6** All new residential buildings will incorporate roof gardens, balcony gardens and/or community gardening plots
Cultural Resources	Maximize cultural resources on the waterfront	Actions only
	Protect and enhance existing cultural and heritage resources	Actions only
	Maximize cultural activities	Actions only
Natural Heritage	Extensive habitat improvement	**H1** Restore terrestrial habitats in accordance with priorities identified in TRCA's TNHSS **H2** Apply habitat restoration techniques in accordance with the Habitat Plan set out in TRCA's TWARHS
	Strengthen native biodiversity	**H3** 80% of all restoration plantings on publicly owned gardens and landscaped areas are native to Southern Ontario; remaining 20% must be non-invasive species
	Clean soil	Actions only
Water	Contribute to improved water quality	Actions only
	Reduce consumption of potable water	**I1** Per capita consumption of potable water at 260 litres per person per day for residential use; 80 litres per person per day commercial

Theme	Objective	Target
	Protect groundwater from contamination	Actions only
	Celebrate waterfront setting and water as a feature	Actions only
Materials & Waste	Waste reduction	**J1** Per capita waste disposal target of 200kg/person/year
	Re-use and recycling	**J2** 75% of lumber from sustainable plantations or recycled sources. **J3** 25% of building materials from recycled or renewable sources
	Local economic development	Actions only
	On-site containment of waste	**J4** Zero transport of leaves and organic waste from the Toronto Waterfront
	Avoid production of hazardous waste	Actions only
Innovation	Stimulate creativity and innovation	Actions only
	Bring attention to Toronto waterfront's sustainability achievements and potential	Actions only
	Ability to accommodate important technological advances	Actions only

APPENDIX 2

Sustainability Checklist for Project Management Planning and Design

Sustainability objectives and targets should be integrated into all phases of project planning, design and implementation. The aim is to make the City of Toronto's waterfront both a national and global model for sustainability. Each project manager is to ensure that the sustainability work is carried out according to the terms and conditions set out in the TWRC's sustainability framework.

Managers have a particular responsibility to ensure that sustainability guidelines are adhered to in all decision-making processes.

Please review the TWRC's Sustainability Framework commitments and determine relevance to project. Additional information is available on the TWRC's website.

Goal	Included (actions taken)	Not included (why not?)
☐ 1. Energy efficiency measures		
☐ 2. Renewable energy production or consumption		
☐ 3. Carbon dioxide emissions reductions		
☐ 4. Link to district energy		
☐ 5. Saving, restoring and/or developing green areas		
☐ 6. Recreational features		
☐ 7. Stormwater treatment		
☐ 8. Street life enhancements (e.g. Mixed land use, public art, attractive walkways)		
☐ 9. Cultural heritage and existing structures & buildings saved		
☐ 10. Easy access to public transit, bikeways, water transport		
☐ 11. Fish and animal habitat enhancement		
☐ 12. Soil & groundwater management		
☐ 13. Facilities for bikes, environmentally friendly cars and boats		

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Goal	Included (actions taken)	Not included (why not?)
☐ 14. Green building guidelines		
☐ 15. Native plants and trees		
☐ 16. Diversified housing and community services		
☐ 17. Noise & light pollution minimization		
☐ 18. Water efficiency measures		
☐ 19. Recycling measures, waste management		
☐ 20. Innovative features		
☐ 21. Community consultation		
☐ 22. Local materials & expertise		

APPENDIX 3

Sustainability Checklist for Project Management Implementation

This list is to help document the sustainability goals achieved by the project. It will allow the TWRC to track what sustainability features have been implemented and to better understand why sustainability progress may be lagging in some areas. Steps can then be taken to improve performance where needed. For more information, please consult the TWRC Sustainability Framework and related guidelines and standards

GOAL	Achieved (actions taken)	Achieved (why not?)
☐ 1. Energy efficiency measures in place		
☐ 2. Renewable energy production or consumption in place		
☐ 3. Carbon dioxide emissions reductions monitored & recorded		
☐ 4. Link to district energy completed		
☐ 5. Green areas saved, restored and/or developed		
☐ 6. Recreational areas developed		
☐ 7. Stormwater treatment integrated		
☐ 8. Street life enhancements (e.g. Mixed land use, public art, attractive walkways) completed		
☐ 9. Cultural heritage and existing structures & buildings saved and/or developed		
☐ 10. Easy access to public transit, bikeways, water transport		

APPENDIX 3

GOAL	Achieved (actions taken)	Achieved (why not?)
☐ 11. Fish and animal habitat enhanced		
☐ 12. Soil & groundwater management addressed		
☐ 13. Facilities for bikes, environmentally friendly cars and boats provided		
☐ 14. Green building guidelines implemented		
☐ 15. Native plants and trees planted		
☐ 16. Diversified housing and community services		
☐ 17. Noise & light pollution minimized		
☐ 18. Water efficiency measures in place		
☐ 19. Recycling measures in place		
☐ 20. Innovative features in place		
☐ 21. Community consultation completed		
☐ 22. Local materials and expertise used		

APPENDIX 4

An Example of Detailed Guidelines for an Individual Action or Target

Materials and Waste
Action: Choose salvaged or recycled materials over new ones and re-use building components and existing systems where safety and suitability permit
PREDESIGN
Project Initiation Identify opportunities for using existing building components during early project discussions. **Feasibility** Critically evaluate structural integrity, building envelope, functional suitability, compliance with current codes, and historical significance to determine what portions of the facility can be retained.
DESIGN
Schematic Design Identify existing walls, equipment, fixtures, and other components that will be retained and re-used in the project and develop design strategies that incorporate them in design. Prepare a list of materials and equipment that can be salvaged and will not be re-used in the renovation. Schedule a walk through with a local salvage or demolition company to identify what items can be salvaged. See Resources for list of salvage and demolition companies For monitoring purposes (non-shell components) 1. Calculate the total area of existing non-shell components (interior walls, floor covering and ceiling systems) 2. Calculate the total area of non-shell components (interior walls, floor covering and ceiling systems) that will be retained in new project 3. Divide 2 by 1 to obtain the percentage for non-shell components that will be used in the project 4. Determine what portion of the existing building structure and shell will be retained 5. Assign the points earned for using the existing building components

CONSTRUCTION
Specify the existing building structure, shell, and non-shell components that will be retained and used in the project. For items that will be salvaged, determine requirements for site storage and transportation to salvage company.

OCCUPANCY

Operation & Maintenance
Educate building occupants, operations staff and, where appropriate, the general public about areas and systems of the building that were retained and used in the project through signage, brochures, or other publicity.

APPENDIX 5

Response to Preliminary Concerns About the Draft Sustainability Framework

During preliminary consultation on the Sustainability Framework March 2004, a number of concerns were raised about the value of the sustainability concept. In addition, it was apparent that sustainability is not widely understood which is understandable since it is in many ways a new and emerging concept, particularly for the City of Toronto.

Concern	Response
Too many things are covered by sustainability	Sustainability is based on a systematic inclusion of elements that we know contribute to sustainable community development in other parts of the globe. Priorities are defined through consultation to focus sustainability efforts. An approach that includes environmental AND economic AND social considerations meets the definition of sustainability put forward by our government partners, in particular, the City of Toronto's Sustainability Charter and Strategic Plan and the Federal Government departmental sustainability strategies
We're already doing sustainability on the waterfront. By cleaning up brownfield sites and building in-fill communities including housing and parks on those sites and previously underutilized lands we are already doing nearly everything we need to do to be considered sustainable.	Sustainability is about more than compact urban development on rehabilitated brownfield sites using existing infrastructure. Those are important steps to be sure but the definition is much broader and includes: • Long term perspective in decision-making • Balancing and integrating environmental, economic and social benefits (not just about the environment) • Broad range of perspectives brought to decision-making And its about leadership. Building communities on brownfield and abandoned sites is moving in the direction of sustainability but what type of communities are you putting there? How are you interacting with or enhancing the natural environment? How are the economic benefits of the development being distributed over the long run?

Concern	Response
We are setting our standards too high	Do we want to shoot for mediocrity? Other cities have demonstrated that many of the actions and targets being proposed are considered progressive and sensible from a long term perspective. We want to be leaders. Consider the opposite: We do NOT want to set our standards too high.
There is little or no market for buildings with sustainable design features	There is a growing market for building with sustainability design features, although it is still very small. As part of its leadership role on sustainability the TWRC will promote the value of sustainable buildings to potential developers and owners.
The measures proposed in the draft framework are too expensive	We do not want to push for unreasonably expensive solutions but if we are taking a long-term view and a full cost accounting perspective, then over 2 or 3 decades the targets are, in fact, reasonable. We do not have to deliver on everything in the next 2 or 3 years. Scope and pace will be dependent on response to the innovation challenge, funding, successful partnerships and increasing knowledge over time of what contributes to greater sustainability. For contentious targets where information is scarce and the TWRC feels they are important, a feasibility evaluation will be done to determine cost implications and the best numbers or objectives to shoot for.
We need decision-making that will help us identify the necessary trade-offs	A sustainable approach is designed to minimize trade-offs by finding common ground among potentially competing objectives. But there may be instances where tradeoffs are unavoidable. The decision-making approach in this case is dependent on doing a solid review of the alternatives and doing broad consultation to determine which alternatives meet the greatest number of objectives. Trade-offs need systematic review of the options and documentation of why the final choice was made.
Why these targets? Where did they come from? What is the science behind them?	The majority of the targets come from standards set at communities recognized internationally as leaders in sustainability. They are introduced as a starting point for discussion and refinement and to help develop a made-in-Toronto solution.