
Integrating Green Space is Not an Option

Recommendations and Case Studies for Integrated Design and Municipal Infrastructure Development

Prepared by Landscape Newfoundland & Labrador
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Cities and towns around the world are recognizing the need to undertake a sustainability restoration phase to consider future energy, water and transport requirements, together with other environmental impacts and important issues such as the provision of employment and food. This is of particular importance where development plans include the enlargement of smaller towns and cities into new cities or mega-cities. This document will demonstrate how municipalities in the province of Newfoundland & Labrador can take a holistic approach to development, through the integration of architecture, built and natural infrastructure, and social structure, which can improve livability, social impact and economic results.

In this century, we will face energy shortages, a natural environment that continues to degrade and destabilize, loss of agricultural lands, water shortages, and more. Cities and towns will need to grow and develop very differently than in the past. Pre-existing zoning is difficult for municipalities to change proactively in support of sustainability.

A new development path is required. One that ensures urban development does not degrade the surrounding environment and is responsive to economic, environmental and cultural needs of the region.

'sustainability'

design, construction, operations and maintenance practices that meet the needs of the present without compromising the ability of future generations to meet their own needs

Where we are

Today, the dominant city-building style in Newfoundland & Labrador is to construct a large number of single detached homes, a lesser number of townhouses, separate areas for retail activities and for employment, and road-systems that lend themselves to a continued emphasis on travel by personal automobile. In smaller towns, multi-unit residences and commercial spaces are even less common. Native trees, shrubs and grasses, along with the existing topsoil, are completely removed during development and waterways are often re-routed.



Climate change is placing further stress on our natural landscapes. Adaptation to climate change has been identified as a central part of planning throughout Canada. Recent storm-damage to our urban forests may indicate a trend toward more such

events. The perceived benefits of the current warming may be short-lived, as invasive species and pests affect native plant and animal populations.

How do we change?

Key components of sustainable urban development are compactness and an intimate mix of residential and non-residential uses, and where most daily trips are not taken by automobile, but by bicycle or on foot through green corridors, or by public transit. There is a focus on protecting and developing outdoor space, including private yards, small parks, schoolyards and athletic fields, and protected natural spaces that exist within the boundaries of a city's developed areas.

'green infrastructure'

*an interconnected green space network of natural areas,
public and private lands and other protected open spaces.*

By aligning land development and management practices with the functions of healthy ecosystems, municipalities can re-direct developers, property owners, site managers, and others so as to restore or enhance the ecosystem services provided by the built landscapes.

Canada Green Building Council

Canada Green Building Council promotes a program called Smart Growth. It is a collection of land use and development principles that aim to enhance quality of life, preserve the natural environment, and save money over time. Smart Growth principles ensure that growth is fiscally, environmentally and socially responsible and recognizes the connections between development and quality of life. Smart growth enhances and completes communities by placing priority on smart infill, redevelopment, and green space protection.

There are 10 principles;

1. Mix land uses. Each neighbourhood has a mixture of homes, retail, business, and recreational opportunities.
2. Build well-designed compact neighbourhoods. Residents can choose to live, work, shop and play in close proximity. People can easily access daily activities, transit is viable, and local businesses are supported.
3. Provide a variety of transportation choices. Neighbourhoods are attractive and have safe infrastructure for walking, cycling and transit, in addition to driving.
4. Create diverse housing opportunities. People in different family types, life stages and income levels can afford a home in the neighbourhood of their choice.
5. Encourage growth in existing communities. Investments in infrastructure (such as roads and schools) are used efficiently, and developments do not

- take up new land.
6. Preserve open spaces, natural beauty, and environmentally sensitive areas. Development respects natural landscape features and has higher aesthetic, environmental, and financial value.
 7. Protect and enhance agricultural lands. A secure and productive land base provides food security, employment, and habitat, and is maintained as an urban containment boundary.
 8. Utilize smarter and cheaper infrastructure and green buildings. Green buildings and other systems can save both money and the environment in the long run.
 9. Foster a unique neighbourhood identity. Each community is unique, vibrant, diverse, and inclusive.
 10. Nurture engaged citizens. Places belong to those who live, work, and play there. Engaged citizens participate in community life and decision-making.

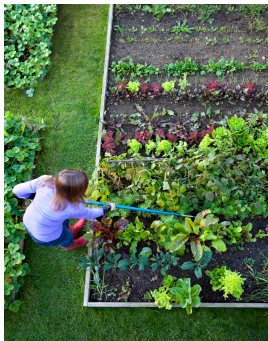
For the purpose of this submission, Landscape Newfoundland and Labrador will focus specifically on those principles that relate to green space and how they work in tangent.

Benefits of integrated green space

Microclimate parks

Use of green can create a microclimate and diminish the urban heat island effect. Trees can be used to protect against wind, regulate temperature extremes, and lessen ozone production. Increasing tree cover in a systematic way can reduce total energy used for heating and cooling in the buildings they surround. Simply reducing the amount of paved surfaces can further reduce surface temperature. Trees in parking areas keep cars cooler and reduce the amount of hydrocarbon emissions from parked cars.

Environmental benefits



Green infrastructure – the living systems that support a city’s successful functioning – includes everything from the urban forest to urban parks to wetlands and streams and private back and front yards. Urban agriculture (including personal food gardens) is one form of green infrastructure that connects with all others and provides many ecological benefits in the urban environment. Plants take in carbon dioxide and release oxygen; filter pollutants from the air; capture rainwater and encourage it to percolate down to the groundwater; build the soil; and create habitat for pollinating insects and birds. Urban agriculture also increases the city’s green space, helping to make the urban environment more comfortable and livable for everyone.

Ecological protection

High density can help preserve farmland and natural areas in a region. Waterfront and parks areas can have designed habitat areas. Surface water management increases biodiversity and livability. Contaminated soils can be treated over time with landscaping methods to help clean groundwater. Native plants and non-native plants used in landscape support native species of insects, birds and other wildlife.

Community Health

Green, open space spawns recreation – recreation encourages people to live healthier lifestyles and provides a public space for social contact. Quality and usability are essential.

Because walking is a much more frequent mode of travel in sustainable communities, there is more casual social contact along the way, and more opportunity to develop friendships. Where the children’s ‘backyard’ is the neighbourhood, more interaction with other children and adults helps to develop social skills. A pedestrian-focused community where daily needs are accessed by walking increases not only contact with neighbours, but raises awareness of and concern for the condition of the local community, the public realm. In suburban automobile-dependent communities, the lands between home and the mall are less noticeable and less important to drivers.



Recreation also encourages recreation related business. By incorporating space for enterprise such as restaurants and cafes, kiosks, tourism, water sports, etc. into green space, businesses can benefit economically from recreation in the municipality.

Not all green needs to be accessible. Views of green are also important for the overall green image of the municipality. Studies have shown that both physical and mental health improves not only with access to green space, but also when green views are available. People experience fewer doctor visits, shorter stays in hospital, reduction in the use of painkillers, and fewer sick days from work.

Economic growth and stability

The economic benefits of inclusion of green space in business areas are realized in several ways. Integrated green space helps to create the positive green image many companies and industries strive for, making the area highly desirable for long-term business tenants. By providing a healthy environment for employees, businesses can expect to see a reduction in absenteeism and an increase in productivity and work quality. Integrated green space increases the real estate value of parcels within the business park. By including green spaces that can be used for recreation by both

employees and surrounding residents, useful hours are extended, resulting in deterrence for criminal activity.

Making the change

Diversification of land uses

As a result of policies that reinforce the separation of uses, access to community shopping plazas business parks is almost exclusively by automobile. The result is vast areas of parking spaces, and roadways that are wider and more numerous than may otherwise be necessary. Public transit access is often inconvenient, disadvantaging residents who do not have cars for reasons of income, frailty or age. Areas of turf grass at the fringes of commercial property are destined to become areas of additional retail-only use.

Implementing proactive zoning changes to support diverse intensification of land uses, and providing incentives/disincentives to ensure that all redevelopment moves in environmentally appropriate directions creates pockets of green space. Pressure on greenfield lands for suburban development is reduced by the amount of infill/intensification at the retail centre. The result is a reduced need for public infrastructure (roads, pipes) and reduced transportation pressures.

Attract businesses, employers, employees and customers by providing attractive multifunctional spaces for business, residential, recreation and ecology.



Recommendations:

- Implement substantial residential floor space indexes for retail areas.
- Implementation of a minimum requirement for functional green spaces and corridors on retail centre property to improve the outdoor ambience and so views are more attractive from indoors; planting more trees, creating parkettes with fountains, benches, etc.
- Ensure all destinations in the area are pedestrian/bicycle friendly, by adding safe, separated lanes for travel by bicycle, and adding green corridors where there are none, to connect all areas of the business park and to the surrounding urban network.

Green buildings and infrastructure

Commercial developments often create the need for additional infrastructure in surrounding and outlying areas (sometimes also affecting other municipal jurisdictions) to manage increased run off, shoreline stabilization, and industrial discharges. The concrete and asphalt jungle does little to mitigate the resulting CO2 emissions, increasing the carbon footprint of each business and the City as a whole. However, even existing retail and commercial zones can be transformed so they can be both profitable and environmentally less damaging. Smart developments will add to the number of green spaces and reduce impervious surfaces.



From nature's perspective, sewage treatment allows all sorts of nutrients to be wasted, and all sorts of chemical pollutants to be entering the ecosystem. The typical underground storm water drains carry away the rainwater that used to permeate gradually into soil, allowing the root systems of trees and shrubs to feed. Without the moisture, they become stressed, and may die. The greater the paved area

within a development, the more storm water is collected, and the less that is returned to the ground.

Because of their more compact nature, sustainable developments can use up to 35% less water for lawns than a typical low-density subdivision. There are numerous opportunities to improve water use and management using green roof technology in buildings, and designing parking lots and roadways in a manner that allows for the ground to absorb water rather than removing it.

Recommendations:

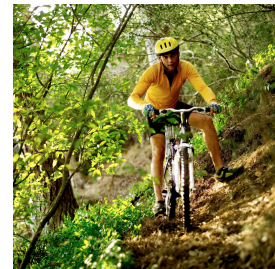
- Adopt the integrated design approach in public projects and adopt the same in the review of private proposals.
- Provision of tax incentives for adding rooftop rainwater collection systems to provide grey water for plants and toilets, reducing storm water runoff and use of treated municipal water.
- Provision of tax incentives for installation of individual composting toilets coupled with miniature, constructed wetlands for grey water treatment.
- Development of tertiary sewage treatment systems with source control programs, or large-scale constructed wetlands to control storm water run-off.
- Encourage of pervious paving solutions for parking lots and driveways in both commercial and residential space.
- Establish an alternative to treated water for commercial use through collection of grey water and access to natural water sources.

- Use bioswales and retention ponds to manage run-off rather than current storm-water diversion systems.
- Combine LEED and Sustainable SITES practices in all policy development.

Preservation of green space

If the current pattern of development continues, much of the province's remaining farmland will be paved over by the year 2020. It is not only loss of farmland that worries people - it is also loss of habitat, forest cover and recreational green space that can be used for parks, nature reserves or trails.

Establishment of parklands offers areas of urban forest, native species, habitat, surface water management systems, and a significant component of community gardens. The reestablishment of wetlands and degraded rivers and streams is a natural and cost effective approach to improving water quality and quantity management while also providing opportunities for habitat and amenity space. Aesthetically pleasing improvements to trails and waterways enhance the value of green infrastructure, but only when their design and implementation are ecologically sound.



In Charleston, Carolina, a study showed that depending on the way it was designed, for the same number of houses, a proposed development could provide either 30 acres or 400 acres of green space. When green space is protected, studies show that nearby property values can increase anywhere from 5-50 per cent, as homeowners place value on the amenity. Aesthetically landscaped run-off controls such as ponds and wetlands can increase property values by as much as 50% by appealing to buyers who are interested in hiking around wetlands and ponds, or bird watching.

High density helps preserve farmland and natural areas in the region.

Recommendations:

- Set aside at least 20 per cent of the protected green space in each neighbourhood as undisturbed, leaving it in its natural state.
- Ensure these green spaces are connected through linked walkways and trails and are within 0.8km of all residents.
- Limit land clearing in new developments to only what is necessary to facilitate buildings and required infrastructure.
- Protect existing agricultural land through intensification of existing neighbourhoods and densification in new developments. Find alternate uses for non-productive land such as community gardens and composting piles to ensure the land is available to future generations of farmers.

- Ensure wetlands, ponds and other natural areas are accessible to all residents and employees of an area, not just those owning land in the immediate surrounding area.
- Ensure waterfront and parks areas have designated habitat areas.
- Commit to use of a mix of native plants and non-native plants in public landscaped areas that support native species of insects, birds and other wildlife.
- Implement no-discharge rules for sediments and pollutants.
- Encourage multi-layered buildings with views over rooftops, replacing the grey roofs with green roofs.

Engaged citizens

The greater part of our green infrastructure exists as public space, so citizens must see themselves as beneficiaries and custodians. This requires ongoing efforts in public involvement and education.

Recommendations:



- Create campaigns to encourage more plants and less impervious surfaces in private gardens.
- Endorse programs like Tidy Towns and Canada Blooms to increase the level of pride in the community.
- Create opportunities through strategic partnerships to involve citizens in reclamation, reparation and revitalization of green space.
- Create strategic partnerships to facilitate effective knowledge exchange from a diverse skill set.
- Buy local and use local contractors whenever possible.

Integrated Pest Management

Industry is struggling to utilize a developing integrated pest management strategy. This is in part as a result of a lack of education with developers and enforcement on developers, homeowners and the landscape industry. When soil levels and amendments are poor and landscaping design does not meet acceptable standards, plant health is affected and plants are more susceptible to weeds and pests.

Successful IPM strategies have buy in from municipal leaders.

Recommendations:

- Enforce the minimum soil depth of six inches on new installations of turf grass.

- Implementation and enforcement of policy to limit removal of trees over 30 cm in diameter during development and require that those that must be removed be replaced with trees which are at least 3 meters tall and are a native or non-invasive species identified from an approved list of trees. The replacement of trees should be on a one-to-one basis and remain on the original property, and where not possible remain in the immediate neighbourhood.
- Require that developers maintain important elements or features of the natural environment and aesthetically pleasing landscape features so as to allow industry to work with the landscape rather than against it.
- Encourage homeowners to request that contractors use companies with certified landscape technicians on staff for their hardscape and softscape installations.
- Require that developers use companies with certified landscape technicians on staff for their hardscape and softscape installations.



Questions for Sustainable Development Proposals

There are simple questions that a municipality can ask when reviewing development and re-development proposals.

1. Has an ecological and habitat inventory of the site been conducted?
2. Are plans in place that provide ecological protection for streams, rivers, wetlands, nesting sites and groves of trees on the site?

3. Do the plans propose conservation covenants or other protective measures for ecologically sensitive areas?
4. Is there a monitoring and enforcement strategy in place for covenants and is there sufficient capacity for the strategy to be successful?
5. Is there a watershed management plan or regional green space protection plan?
6. Do the plans include parks and open green space, landscaping regulations within a set minimum that is required?
7. Do they include community allotment gardens?
8. Is there a focus on buying and hiring local?

Green space is not an option.



Appendix 1: Valuable Resources

Green Infrastructure: Linking landscapes and communities (2006)

Mark A Benedict and Edward T. McMahon

http://www.conservationfund.org/pubs_product_list/131

The Green City Guidelines: Techniques for a healthy livable city (2011)

Michelle de Roo

[http://www.thegreencity.com/Highlights/The Green City Guidelines](http://www.thegreencity.com/Highlights/The_Green_City_Guidelines)

The Sustainable Sites Initiative

American Society of Landscape Architects, Lady Bird Johnson Wildflower Center and United States Botanic Garden

<http://www.sustainablesites.org>

Landscapes Give Back

Sustainable Sites Initiative

<http://www.sustainablesites.org/about/landscapesbrochure.pdf>

LEED for Neighbourhood Development

Canadian Green Building Council

<http://www.cagbc.org/Content/NavigationMenu/Programs/LEED/RatingSystems/Neighbourhooddevelopments/default.htm>

A Citizen's Guide to LEED for neighbourhood Development: How to Tell if

Development is Smart and Green

[http://www.nrdc.org/cities/smartgrowth/files/citizens_guide LEED-ND.pdf](http://www.nrdc.org/cities/smartgrowth/files/citizens_guide_LEED-ND.pdf)

Phipps Conservatory's Integrative Design Process

<http://www.youtube.com/watch?v=0qk4hbNEWdQ&list=PL3ED174EF196408AC&index=2&feature=plcp>

Appendix 2: Design Charrette – Ropewalk Lane

The old Dominion site on Ropewalk Lane in St. John's has been vacant for a significant period of time. This store closed when Dominion opened a much larger store somewhere else, leaving a silent concrete and asphalt landscape in this mixed-use neighbourhood.

In a city with a bubbling, thriving economy, commercial space is in demand. With urban sprawl ever expanding, there is a call to increase density. We asked two working groups to consider the following:

- If this site were available for re-development tomorrow, how would you approach it?
- What could be done to solve some of the issues the city of St. John's is facing?
- Remember to use integrated design principles and to focus on developing an area integrating green space that is both functional and pleasing to the surrounding businesses and neighbourhoods.



The site was identified as having an underutilized strip mall, in addition to the connected former grocery store. An active commercial space and coffee shop is located across the street. The site also has an undeveloped land area close by. Total acreage is about 11 acres, and is the highest point of land in the area. The result is a fairly barren landscape with high winds.

A revitalization of entire site excluding coffee shop and commercial space was recommended as the optimum option. There already exists a good starting point for mixed land use and reviving this commercial area will serve the surrounding neighbourhoods well.



Recommendations

Both groups developed designs demonstrating a better utilization of space, with increased green space surrounding the commercial development. Green space was a focus with each group in managing runoff and flooding in surrounding low-lying areas. It also was important for both working groups to revive the area as an enjoyable, livable space. The end goal was a mixed-use development with a 30% building footprint, 30% green space and 40% parking and access.

The proposed plan called for a high-rise development to replace the existing grocery store and strip mall with underground parking. The building would contain 660 residential units of an average of 1,200 square feet and 140,000 square feet of retail/services space in the first level of habitable space. Assuming the land is valued at \$10 million, this translates to a value of \$20 per square foot.

Working Group 1 also proposed a cul-de-sac installation at Prowse Avenue Extension, with development of retention pond for water capture. The group also suggested redirecting Pennywell Road to align with the service road for improved traffic flow.

BARRIERS TO DEVELOPMENT	SOLUTIONS
<ul style="list-style-type: none"> • Wind • Traffic flow • Inhospitable environment • Land cost • City restrictions on height of structures • Water run off • Multiple land owners 	<ul style="list-style-type: none"> • Grouping of buildings in an effort to create a more hospitable environment and control wind movement • Use of high rise structures to reduce building foot print and create economic stability for development • Focus on water retention for the site through the strategic placement of absorptive green spaces • Reduce water run off with porous concrete pavement • Reduce black top and increase open green space by integrating underground parking

Green roof developments for usage as common area on lower building over parking lot and installation of parkettes soften what would otherwise be a concrete jungle.



PRO's	CON's
<ul style="list-style-type: none"> • Reviving of a waste land space • Development of a gathering place for all demographics of the neighborhood • Creation of a link connecting grand concourse's Mundy Pond and Wishingwell Park trails • Improve amenities for all neighborhoods within walking distances • Improve waste water runoff • Increase tax base for city • Reduced services per household versus a opening up a new development • Increasing community open green spaces • Wonderful views for residents without blocking other peoples views 	<ul style="list-style-type: none"> • Neighborhood properties will experience less direct sunlight • Due to parking garage design project will be required to be completed in one phase • Increased density may require significant infrastructure amendments • High cost of development

Appendix 3: Design Charrette – Glencrest

Also known as "Danny-ville", the Glencrest Development is said to be the size of Gander and will offer all of the amenities residents and business owners will need. The proposal for Phase 1 of the project has 60 developable hectares and includes;

- Available retail space totaling 72,000 square feet
- Suites ranging from 2,000 to 5,700 square feet
- 254 parking stalls
- Box-store development totaling 324,000 square feet
- Suites ranging from 3,500 to 110,000 square feet
- 2,027 parking stalls
- Residential area of 46.77 acres
- 192 building lots fully serviced



We asked two working groups these questions;

- How would you develop on this clean slate?
- Is Phase 1 on track?
- Should Phase 2 go in a different direction?

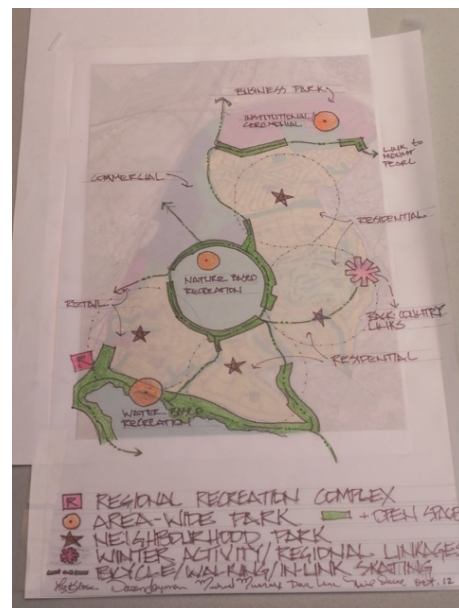
The rationale the groups focused on in determining their plans for the development was one of integrated residential, business, parkland and social interaction. Municipalities must understand that they are more empowered than ever to set and implement rules and regulations around development, ensuring that developers pay attention to "the business of good design" - not just the money - and see the value in being connected to the citizenry.

Recommendations

Mirroring the Grand Concourse integrated system of trails, the development needs an open space buffer to prevent development encroaching on the trail. The trail system has to be planned in concert with varied uses, streets and open spaces, and take into account the natural environmental cycle.

With regard to landscaping commercial spaces, maintenance is very important and must be enforced through inspections and accountability. Encourage the use of natural plant life to integrate with the existing landscape.

In all developments, soil replacement should be a key requirement, along with a "tree retention



plan” in consideration of carbon offset. Preservation of ground water aquifers, fish spawning, bird nesting, and other habitats increase potential for eco-tourism, livability and value of the surrounding properties. When planning land development, first identify the pieces of land that need to be preserved - steep inclines, watershed areas, cliffs – and have trails lead to focal points like Cochran Pond – and put a focus on trees and walkability.

BARRIERS TO DEVELOPMENT	SOLUTIONS
<ul style="list-style-type: none"> • Elevation • Steep inclines • Wind • Traffic flow • Water run off management • Building height restrictions 	<ul style="list-style-type: none"> • Grouping of buildings in an effort to create a more hospitable environment and control wind movement • Focus on water retention for the site through the strategic preservation of absorptive green spaces • Tree retention strategy for entire site, benefits are drainage, wind protection, aesthetics • Focus on drainage when designing parking lots • Build "non-traditional" forms of development. Homes don't have to be rectangles; sub-divisions don't have to be linear • Parking on the outside of the shopping areas and make it a walkable area amongst the shops

Mapping the assets and identifying the gaps between them will allow definition of a hierarchy of factors to be considered during planning. Open public space promotes community interaction and social networking. Good design can improve life satisfaction and well-being.

Green development is beneficial to the economy for a number of reasons. It attracts businesses and workers. Tourism based businesses benefit because they're next to major outdoor amenities. A green economy needs to recognize the true value of ecosystems and natural resources, and the economic benefits of long-term ecologically and socially sound economic activities.

Green development is



Key to a green development:

- Smart Locations
- Design with Nature
- Connected Neighborhoods
- Neighborhoods that Use Land Efficiently
- Diverse and Convenient Neighborhoods
- Recycling and reusing within the site

PRO's	CON's
<ul style="list-style-type: none">• Climate change mitigation and adaptation• Reduced water consumption and water protection• Reduced air pollution• Opportunity to provide amenities for all neighborhoods within walking distances• Improve waste water runoff• Increase tax base for city• Reduced services per household versus a opening up a new development• Increasing community open green spaces• Wonderful views for residents without blocking other peoples views	<ul style="list-style-type: none">• Neighborhood properties will experience less direct sunlight• Due to parking garage design project will be required to be completed in one phase• Increased density may require significant infrastructure amendments• High cost of development

The transition to a greener outdoor space is about being a leader tomorrow.



Appendix 4: Design Charrette – Lundrigan’s Marsh

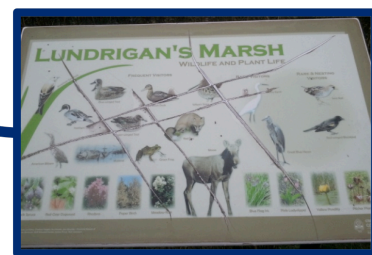
Lundrigan's Marsh Lookout is located immediately northeast of PF Collins at 275 East White Hills Road.

In October of 2004, the City of St. John’s signed two Agreements which would ensure the protection and preservation of Lundrigan’s Marsh for future generations. Firstly, an Implementation Agreement was signed between the City, the NCC, and DU, whereby these two non-governmental organizations entrusted the care and preservation of the 25 purchased acres of marshland to the City. Through this action, the City of St. John’s committed to maintain and administer the land for long-term conservation and management and to seek ways to minimize and eliminate the effects of human activity on wetlands within the City.



We asked a working group to recommend an integrated design plan that focused on protection of the marsh, improving the existing lookout, and providing green corridors that can be utilized both by the general public and employees of the surrounding commercial space.

Much of the marsh is concealed from view by surrounding development.



Two of the most accessible portions currently are the lookout off East White Hills Road beside **P.F. Collins**, and behind **Keep Cool** on Logy Bay Road.

Recommendations

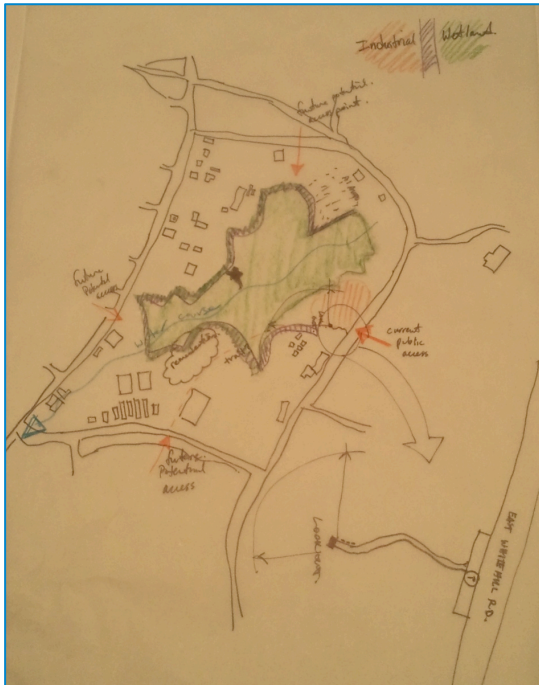
Short term focus

With ongoing industrial encroachment a concern, the working group recommended that the City identify the wetland unit boundaries and protect it by prohibiting further encroachment.

- Upgrade the existing outlook and access (lower viewing platform)
- Engage additional partners conservation and community partners as stewards
- Engage commercial-industrial partner initiatives (East and North sides)
- Begin process of bank stabilization through consultation with horticulture specialists with bio-engineering expertise
- Build employee awareness within the industrial area and organize clean-up programs around the fringe of the wetland
- Ensure appropriate land use zoning for the entire unit
- Establish policy and develop guidelines for 'softer edges' between development and (re)naturalized areas
- Implementation and enforcement of a zero net run-off policy
- Identify land acquisition targets and strategy

Mid range focus - 5-10 years

Build public-private partnerships to support expanded demonstration project



- Develop community-based wetland education and awareness projects
- Outdoor classrooms for area schools
- Community centres and organizations hosting interpretation activities
- Proposals for post-secondary research to diversify activities in-situ
- Retrofit infrastructure demo projects (pervious surfacing, ongoing drainage system upgrades, green roof developments)
- Expanding implementation of 'softer edges' by property owners adjacent to the marsh

Long term focus

Consolidation and re-naturalization of southern industrial back lot areas

- Restoration of additional land areas in the vicinity
- Linkages with existing trail systems leading to adjacent neighbourhoods and workplaces
- Numerous marsh stewards
- Healthy wetland habitat
- Watershed education and research activities
- A model to apply elsewhere