



## City of Maple Ridge

TO: His Worship Mayor Michael Morden      MEETING DATE: November 9, 2021  
and Members of Council  
FROM: Chief Administrative Officer      MEETING: Council Workshop  
SUBJECT: Green Infrastructure Management Strategy

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### EXECUTIVE SUMMARY:

One of the key priorities identified in Council's 2019-2022 Strategic Plan was the preparation of a report to outline policy and action options associated with a municipal Green Infrastructure Management Strategy. On November 12, 2019 Council endorsed the development of a Municipal Green Infrastructure Management Strategy along with a process to determine how and where the City might integrate this kind of an approach into future decision making, departmental business plans, development review requirements, and urban design best management practices.

This report introduces the Green Infrastructure Management Strategy (Appendix A), developed by EcoPlan International, which outlines why a green infrastructure approach is important for Maple Ridge and what next steps and options are appropriate. The focus of the Green Infrastructure Management Strategy applies mostly to urban growth areas but it includes consideration for both greenfield and urban infill development areas. Council is being asked to endorse in principle the framework, noting that this does not indicate support for moving forward with every action item identified in the strategy. Rather, the action items will be discussed in more detail in an Implementation Strategy Report that will be presented for Council's consideration in the future.

Council's Environmental Advisory Committee (EAC) has provided feedback into the findings and recommendations in the Strategy. On October 6, 2021, EAC members supported the Green Infrastructure Strategy being forwarded to Council for endorsement and provided written feedback as included in Appendix B.

### RECOMMENDATIONS:

1. That the findings and overall framework of the Green Infrastructure Management Strategy be endorsed in principle, noting that the action items contained in the Strategy will be considered separately during the development of the Implementation Strategy; and
2. That staff, in consultation with the Environmental Advisory Committee, be directed to prepare a Green Infrastructure Implementation Strategy that identifies short-term high priority action items.

**DISCUSSION:**

**a) Background Context:**

On November 12, 2019 Council endorsed a process for the creation of a Green Infrastructure Management Strategy. The process included the establishment of the following:

- An inter-departmental Task Force Group consisting of directors and managers from various municipal departments including Planning, Engineering, Parks and Leisure, Economic Development, Information Technology, Operations, Finance and Building.
- The formation of the Council endorsed Environmental Advisory Committee Green Infrastructure Sub-Committee. This Sub-Committee consists of local experts and key community decision makers from the Chamber of Commerce, Business Improvement Association, architects, landscape architects, urban designers and planners, urban forestry experts, the nursery associations, and input from members associated with the development and public arts community.

The Green Infrastructure Management Strategy development process is summarized in the chart below.

**GREEN INFRASTRUCTURE STRATEGY STEPS**

<b>1. Council Endorse Scoping Report process</b> <ul style="list-style-type: none"> <li>• Council to direct staff to proceed with the Green Infrastructure Management Strategy review;</li> </ul>	November 2019
<b>2. Award Contract and Initiate Project – Eco Plan International</b>	May 2020
<b>3. Phase I: Establish the Foundation &amp; Understanding the Challenges</b> <ul style="list-style-type: none"> <li>• Municipal Comparative Scan – Consultation with local governments and literature review. Report and presentation on lessons learned, comparative review, and determination of relevant applications and case studies for consideration by Maple Ridge</li> <li>• Internal Working Group Meeting – Identification of key challenges, strengths, and opportunities from each department related to Green Infrastructure</li> <li>• Spatial Analysis Review – Initial review and analysis of Town Centre, Lougheed Transportation Corridor and Silver Valley Lands</li> </ul>	June - October 2020
<b>4. Update to Council</b>	November 2020
<b>5. Phase II: Spatial Analysis of Urban Areas - Challenges and Opportunities</b>	January - March 2021
<b>6. Implementation Gap Analysis Challenges and Opportunities</b>	February - April 2021
<b>7. Update to Environmental Advisory Committee</b>	June 2021
<b>8. Phase III: Identification of Options &amp; Recommendations</b>	
<b>9. Recommendations – Provide synthesis of key findings, options, and recommendations for consideration by Council with respect to policy and implementation options for green infrastructure in the City</b>	June – Sept 2021
<b>10. Final Report and Presentation to Council (WE ARE HERE)</b>	November 2021

The Green Infrastructure Management Strategy includes information about what other communities are doing to help them meet their municipal priorities/objectives along with what they have learned about successful application and implementation of green infrastructure. It includes findings about opportunities and challenges facing Maple Ridge related to the application of green infrastructure with different departments, at various scales of development, and between various types of urban areas including Town Centre, major transportation corridors, and Silver Valley lands. The Green Infrastructure Management Strategy also focuses on developing a framework with recommendations about what is appropriate for Maple Ridge with respect to principles, goals, options, and potential implementation items.

**b) Next Steps:**

The Green Infrastructure Management Strategy includes a list of potential next steps and short, medium, and long-term implementation action items. Following Council's endorsement in principle of the Strategy, the larger more complex implementation action items will be broken down into short-term high priority action items and reviewed in more detail with Council. Staff are seeking an endorsement in principle to signal that Council is comfortable with the overall framework of the Strategy, and support further analysis being undertaken to evaluate the consultants recommended Action Items.

This is similar to the approach taken with the Environmental Management Strategy 2014 which provided a road map on potential next steps. The Environmental Advisory Committee reviews the action items and Council considers the item as a component of annual business planning.

**c) Strategic Alignment:**

The Green Infrastructure Management Strategy includes a strong focus on current priorities of Council and falls within Council's fifth strategic priority "Natural Environment". Pursuant with the Council endorsed process, the consultant is presenting on the relevant findings and recommendations coming from discussions with various municipal appointed stakeholders, including the findings to date from other municipalities, from various departments from within the City of Maple Ridge, from the EAC and Green Infrastructure Sub-Committee members.

**d) Interdepartmental Implications:**

The Green infrastructure Management Strategy as noted in the report involved a number of different departments in supporting and participating in the engagement process, including various experts involved with development related professions and the business community working in Maple Ridge.

It is anticipated that the recommendations outlined in the report will also create synergies with work that is already underway by various departments, municipal advisory committees, and with various initiatives that are being undertaken by professional organizations working with the City of Maple Ridge.

**e) Policy Implications:**

The Official Community Plan and Environmental Management Strategy establish goals, objectives, and policies in support of a complete and sustainable community that is vibrant, healthy and safe and also speak to supporting climate change resiliency opportunities which fall in alignment with this initiative. No policy changes are suggested at this time.

**CONCLUSION:**

On November 12, 2019 Council endorsed the development of a Municipal Green Infrastructure Management Strategy along with a process to determine how and where the City might integrate this kind of an approach into future decision making, departmental business plans, development review requirements, and urban design best management practices.

The Green Infrastructure Management Strategy provides a framework outlining the unique and appropriate vision, goals, objectives and next steps that the City of Maple Ridge can utilize to advance the application of green infrastructure in the City. This Strategy builds upon the objectives and priorities identified in the Official Community Plan, the Environmental Management Strategy, and is consistent with Council's strategic priorities including liveable, resilient, vibrant and affordable urban areas. The next step in this process would be for staff and the EAC to review the Strategy Implementation Section, to identify the short term, high priority items and present those recommendations to Council for approval prior to commencing any work.

"Original signed by Rodney Stott"

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"Original signed by Scott Hartman"

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Chief Administrative Officer**

The following Appendices are attached hereto:

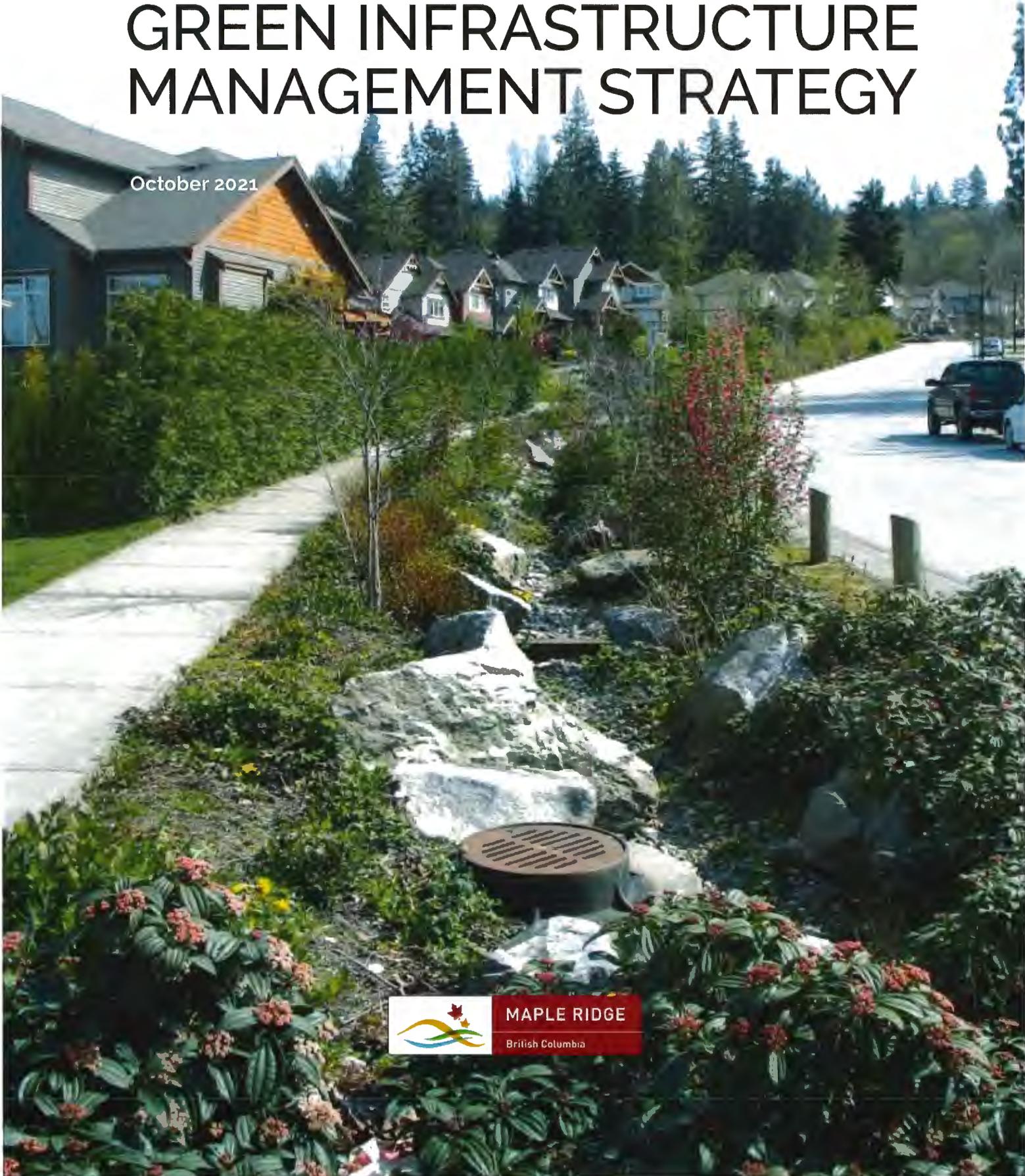
Appendix A: Green Infrastructure Management Strategy

Appendix B: Green Infrastructure Management Strategy Feedback from EAC and GISC Members

City of Maple Ridge

# GREEN INFRASTRUCTURE MANAGEMENT STRATEGY

October 2021



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# Definition

**GREEN INFRASTRUCTURE** refers to the natural assets such as forests, streams, wetlands, vegetation, soils and bioengineered or landscape design solutions that exist now and that have the potential to be incorporated into sites, streets, and neighborhoods that collectively provide the community with a broad array of products, services, and benefits that are crucial to health, livability, cost saving, and sustainable development.

*Adapted from Connecting the Dots  
- Regional Green Infrastructure  
Network Resource Guide, Metro  
Vancouver, 2014*

# Introduction

## Why Green Infrastructure

It's a critical time to look at green infrastructure. Here in B.C., wildfires affecting air quality, record temperatures, drought, severe rain events, and flooding are becoming common annual events. Creating healthy, resilient and equitable living environments while adapting to increasing density and climate change impacts is the main reason for this strategy. Learning from other places around the world and locally, a proactive green infrastructure approach can help provide significant cost savings along with more effective, timely solutions. With redevelopment of our urban infill areas and expansion into greenfield areas, green infrastructure design options can help realize cost savings and provide better urban design to offset impacts on future generations of citizens.

## Purpose

The Green Infrastructure Management Strategy aims to include green infrastructure in the City's municipal toolkit. This strategy provides a road map for the City on how and where green infrastructure can be better integrated into future decision making with regards to municipal operations, capital projects, area plans, and development design practices.

## The Strategy

The strategy is a corporate, inter-departmental and municipal wide initiative. The actions outlined in this strategy support stakeholders and the City, its various departments, the development & business community and its tax payers in achieving objectives of the Official Community Plan (OCP), and Environmental Management Strategy (EMS). It will require an adaptive and incremental approach at various scales working with buildings, sites, streets, neighborhoods and a municipal wide level. Different areas will require appropriate solutions and this may change with time depending on densities, land uses, available resources, and community values.

## Green Infrastructure Opportunities

Green infrastructure also addresses many of Council's strategic priorities. These include:

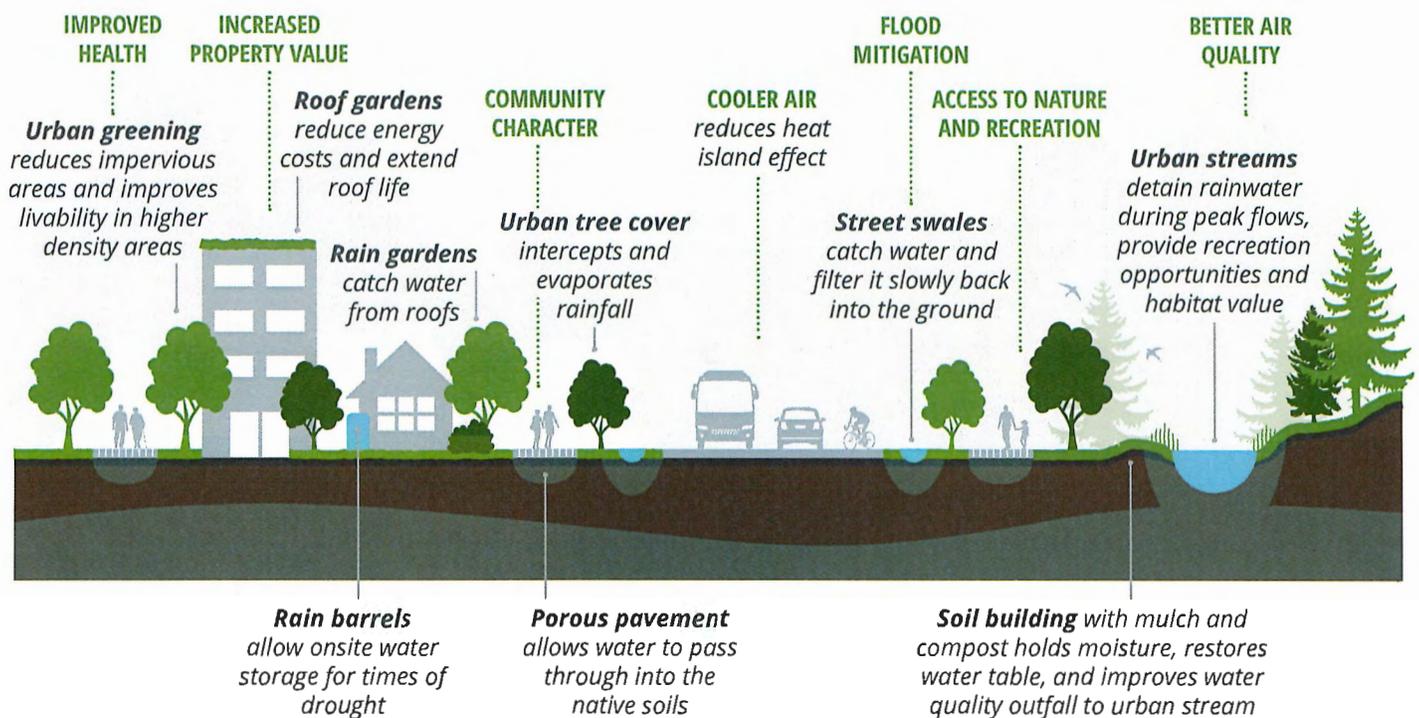
- Safe and healthy communities, including resilience to climate change and mitigating impacts associated with urban densification;
- Social well-being, liveability, access and connection to natural areas and complete healthy neighbourhoods;
- Economic vibrancy, cost savings, and adding to a business-friendly environment;
- Ecological health and fostering the importance of community connections to urban ecology.

The outcome of acting today will build resiliency, create vibrant urban centres and support healthy living into the future.

Maple Ridge is extremely fortunate to have existing natural assets and opportunities to incorporate green infrastructure into new development areas. Green infrastructure opportunities can be described from natural to bio-engineered solutions. Such strategies, or a hybrid of strategies, offer multiple benefits and result in a positive return on investment over the long term.

They are a cost effective and proactive choice to manage unexpected events, future risks and known trends (for example, a changing climate, future urban growth, increased urban development). Green infrastructure increases the City's resilience and can help avoid unexpected costs and/or disruptions to the City and its residents.

**FIGURE:** Green Infrastructure Opportunities and Benefits



# Context – Unique to Maple Ridge

*The following identifies trends and opportunities in Maple Ridge. It also highlights key challenges to address, and mitigate as part of longer-term planning and operations.*

## Global and Regional Trends

- Changing weather patterns including increased frequency and intensity of drought, severe rain events and flood risk create unexpected events and risks for the City and its residents.
- Green infrastructure is increasingly emphasized by Metro Vancouver, outlined in Metro 2050, and to member municipalities as a much needed strategy to foster a highly resilient and livable sustainable metropolitan region.
- Many other local governments are having to invest millions of dollars and decades in restoring natural systems and rehabilitating their urban areas while some fortunate communities, like Maple Ridge, still have existing natural assets to work with.

### **WHAT IS ECO-SYSTEM SERVICES?**

*Eco-system services refers to the benefits that healthy, natural eco-systems generate for society. This includes a range of aspects, such as recreational opportunities, clean air and more significant uses, such as stormwater management and flood control. Municipalities have begun to consider these services, assess the value of such assets and include alongside other built assets in municipal planning.*

## City of Maple Ridge Findings

### **OPPORTUNITIES**

- Maple Ridge is well positioned to learn from others and adopt successful and appropriate measures. In addition, there are a number of existing initiatives and work of which the City can effectively build on, including existing natural assets, progressive protection and restoration regulations and integrated ecological development permit guidelines.
- Maple Ridge has significant public owned lands around the municipality that also contain an abundance of natural areas that currently provide eco-system services to our community which help reduce costs to taxpayers.
- The City has a decent tree canopy cover in its greenfield development areas. Adjacent municipal owned forest lands offer good opportunities with respect to economic, social and ecological services, benefits and cost savings that natural assets provide to the community.
- The City is well equipped to update and work with existing information, data and mapping layers needed to support green infrastructure decision-making, tracking and measuring future green infrastructure progress.
- Urban infill (the Town Centre and Lougheed Transit Corridor Areas) offer good opportunities to integrate green infrastructure within neighborhoods, streets, parking areas, sites and in building designs with redevelopment, densification and innovative use of green infrastructure design options.
- In contrast to traditional clearing and subdivision development, future greenfield development provides opportunities to integrate green infrastructure.

- A larger green infrastructure network identifies critical areas and better connects the many parks, natural areas and significant wildlife hubs and corridors across the City, while expanding the City's recreational network connections and function of eco-system services.
- Existing and potential future City conservation areas and public greenspaces offer good opportunities to achieve multiple objectives, such as outdoor recreation, climate change resiliency, urban sustainability, and integrated stormwater management goals.
- Developer and resident oriented, regulatory and incentive programs, performance targets, user fees, education/outreach, incentive programs and best practices for site runoff, increasing tree canopy, or stewardship of other green assets within private lands could further improve and help build the City's green infrastructure system.
- In urban infill areas (such as the Town Centre and along major corridors), the City's green spaces are fragmented or disconnected. This includes watercourses and wetland/riparian areas. Along with pedestrian friendly streets and public greenspaces, opportunities for other forms of urban greenscaping, gardens, and shared green spaces can be explored.
- Existing natural assets on current undeveloped and developed lands are not well defined or included in the City's inventory or mapping database.
- In some urban infill areas, there is limited space on sites, streets, and neighborhoods to provide required or recommended amount of green infrastructure (for example, pervious area, tree retention) without lot assembly. In some areas, there is also limited access to shared green spaces, parks, pedestrian friendly green streets, and gardens.

#### **CHALLENGES**

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- The population of Maple Ridge has been growing at a rate of 2% per year over the past 15 years. In the last two census periods, the City's population grew by 6,204 people, an average growth rate of 1.63%. With this, new residents' drive additional development and loss of natural assets.
- The services & cost savings associated with natural assets or value of green infrastructure has not yet been included in economic analysis or business plans for new development. As such, it's difficult to determine the best or smart use of undeveloped land without information on available natural assets and natural capital we have and how it serves us.
- Relative to other Lower Mainland municipalities, urban infill areas within Maple Ridge have a low tree canopy cover. This puts these areas at risk of increased run-off, flooding, poor air quality and urban heat island effect.
- There is limited opportunity for on site retention or improvements in some areas with conventional development planning and design. Often costs and impacts are transferred onto the City and tax payers. Given limited space in some areas there is a need for integration of on site and off site natural services benefits from green infrastructure can be provided to future residents, businesses, and visitors in these areas.
- Without established requirements, there is potential for loss of existing green infrastructure or natural assets on private lands with increasing density, especially within urban infill areas such as, the Town Centre, Dwedney Trunk Road and Lougheed Highway corridors.

# Guiding Principles

*Guiding principles are the values which support growth of green infrastructure in the City of Maple Ridge.*

- **Long-term commitment:** Action is needed *now* to see significant and measurable change for the future. Thinking and planning beyond election cycles are necessary to maintain momentum and planning into the future.
- **Adaptive and incremental:** Green infrastructure requires ongoing collaboration, input and change from all City departments.
- **Strong leadership from various departments within the City and council:** Actions will require support and resources to ensure success as well as some level of change within each department. A corporate wide initiative requiring all departments to be responsible along with senior management.
- **Inclusive engagement:** Implementation will require everyone to work together (City Council, city staff, community, stakeholders, and residents).
- **Cost effective and resourceful:** Working with and learning from other communities that have successfully managed to incorporate green infrastructure into their communities. Also building on existing programs, natural assets and municipal initiatives.
- **Relevance:** Identifying locally relevant solutions to ensure a good fit for the City.



# Goals

*Goals are high-level and outline the outcomes of the strategy.*

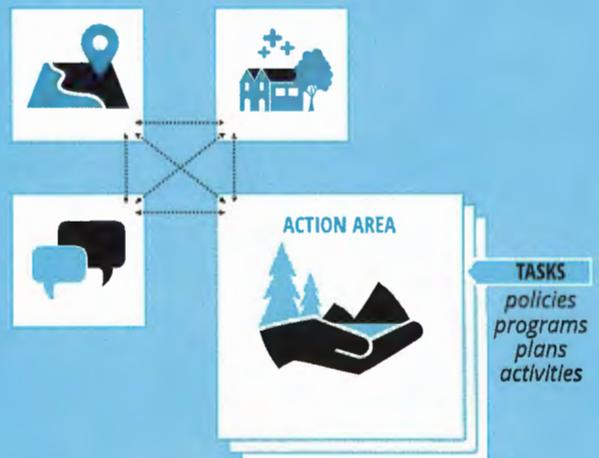
1. Increase the City's level of resilience to possible future shocks and stresses.
2. Foster a culture where natural and built infrastructure receive equal consideration in decision-making processes.
3. Support a healthy, vibrant urban centre.
4. Further build the City's identity and brand as a unique and recognizable place with a strong connection to the natural environment.
5. Improve the health and social well-being for all current and future residents.
6. Maintain the long-term affordability of municipal services for all current and future residents.
7. Build partnerships and awareness around green infrastructure in the City.

# Actions

*Action areas include a rationale and a group of specific tasks related to policies, programs, plans and activities to be undertaken in Maple Ridge. Often, they are inter-related and build-on each other.*

There are 4 key action areas in the City of Maple Ridge Green Infrastructure Management Strategy:

1. Inventory & Value the City's Natural Assets
2. Encourage and Support Green Development & Neighbourhoods
3. Establish Greenscaping Standards
4. Engage and Build Awareness within the City and in the Community



## ACTION AREA 1:



# Inventory and Value the City's Natural Assets

### RATIONALE:

*Maple Ridge includes large areas of undeveloped, city owned, regional and privately held natural areas. Many of these undeveloped land areas currently offer valuable eco-system services. However, these services aren't traditionally recognized, valued and accounted for in the same way as engineered capital infrastructure assets are within the City's management and financial planning.*

*Accounting for these natural areas allows the City to understand the real costs/benefits associated with conventional development, grey infrastructure, the loss of natural areas & maintaining natural assets. It will also form a foundation for the City to track, manage and monitor future green infrastructure performance.*

### Departments Involved:

- Information Services, Planning, Parks and Operations, Engineering, Economic Development, Building, Emergency Services and Finance

**1.1** Identify the City's green infrastructure assets, including existing natural asset such as forests, trees, street trees and unique eco-systems. This includes the hubs, corridors and sites as they relate to the economic and social benefits and services offered to the City (i.e. aesthetics, stormwater management, recreation, wildlife management and safety, connectivity & biodiversity, climate resilience). This may include:

- Development of criteria and metrics to value (monetarily) natural assets for eco-system services.
- Assembly of remote sensing data and Lidar for routine analysis and monitoring of metrics.
- Development of key indicators for tracking and performance of these assets.
- Document the risks associated with changes or damages to natural assets in order to ensure the community understands the value of natural assets and associated risks of losing these assets.
- Identify lands where development occurs within identified high priority areas in the City's green infrastructure network. (i.e. for

private land natural asset protection) for potential covenants and easements.

**1.2** Evaluate natural capital services or develop a Natural Asset and Ecological Management Strategy. This may include:

- Identify assets that provide eco-system services - such as Environmentally Sensitive Areas and Sensitive Eco-systems Inventory lands, wetlands and riparian areas, municipal forests, deciduous and coniferous trees and tree canopy cover across the City.
- Identify portions of Agricultural Land Reserve lands, community forest lands, watershed areas that support green infrastructure functions for the City.
- Existing green infrastructure assets, pervious and impervious areas across the City, etc.
- The objectives should be to identify and evaluate:
  - *the benefits (in dollars) that intact eco-systems currently provide to the City (as a comparison to if these were replaced with grey infrastructure);*
  - *where green infrastructure exists and where it is needed;*
  - *where protection of critical green infrastructure hubs corridors are required;*
  - *high priority conservation & green infrastructure acquisition areas for protection and management.*

- Management of edge areas around community forests, and functional risk management best management practices along with wildlife interface best management practices around new development including urban infill ecological best management practices, i.e. songbirds, habitat, pollinator gardens, community gardens.

**1.3** Draft a Municipal Asset Management Policy that would include specific obligations to operate, maintain and replace natural assets alongside traditional capital assets. This could include requirements to:

- Assess options to preserve, maintain, or enhance existing natural assets and the services they provide, before proposing new built assets.

- Compare the life-cycle costs of natural and engineered assets before making capital investment decisions.
  - *for example, a long term cost benefit analysis can be undertaken to understand the real costs/benefits associated with development & grey infrastructure with loss of natural areas & natural assets versus retention of these areas and assets that are essential for liveability and cost savings in all urban areas.*
- Integrate natural asset management into municipal finance planning, and include in long term financial plans (20 years+).
- Recognize natural assets in the notes section of annual financial statements and other documents, including the need to manage them in conjunction with engineered assets.



## ACTION AREA 2:



# Encourage and Support Green Development and Neighbourhoods

### RATIONALE:

Continued growth and development offers a number of opportunities to further develop “green” area plans to support and encourage green development. This is specifically targeted to the urban infill and redevelopment context. Incorporating a green development approach and practices, as opposed to retrofitting existing development. This will minimize negative impacts, or, ideally, have a net positive impact, on the long-term cost efficiency, health and wellness of residents, resiliency of the City, and protection of the environment and nearby eco-systems.

#### Departments Involved:

- Planning, Parks & Operations, Engineering, Operations, Information Technology, Economic Development, Building and Permits

**2.1** Facilitate a green infrastructure urban design charrette with local experts and municipal stakeholders green infrastructure design options in action and conduct more detailed cost-benefit assessments to determine the most appropriate and viable options in a redevelopment context).

**2.2** Incorporate broader green infrastructure objectives & targets into new area plans, the Official Community Plan goals and objectives, capital works projects, and new park designs or park upgrades.

- Identify green infrastructure options and costing or CBA for Town Centre, and along major corridor redevelopment areas.
- Street design charrette.

**2.3** Bridge the gap between area planning and site planning by creating clear design standards and performance targets for sites, servicing and streets.

**2.4** Outline performance targets for various development types and accountability. Contributions towards these targets can be applied both on site (new development) and off site (within the area plan).

**2.5** Explore the creation and implementation of a Green Infrastructure/Sustainability Development Checklist for identification

and protection of lands where development occurs within identified high priority areas in the City’s green infrastructure network.

**2.6** Outline regulations, design standards, and best management practices for green infrastructure in the public realm in areas identified within the green infrastructure network. This includes design of new park space, recreation areas and other greenspaces, for example, rain gardens, pollinator gardens, etc.

**2.7** Review development procedures and process for incorporating green infrastructure. This may include:

- Update development process checklists to include green infrastructure goals.
- Review initial applications to focus on prioritizing and making better use of existing assets on the land, prior to the development design stage.
- Review land assembly of smaller lots (up to 1 acre) within infill areas, to ensure green infrastructure opportunities and targets can be maximized.
- Set development/redevelopment run-off volume control targets or targets for rainfall management (i.e. development must treat the first 25mm of rainfall on site or manage 90% of all rainfall) for new or infill development. Allowing for on/off-site options.
- Set targets for shared open space areas, above ground detention ponds, green buildings (roof gardens, green walls, etc.) and urban infill greening/landscape.

**2.8** Offer development incentives and consider potential amendments to the Development Cost Charges Bylaw (DCC Bylaw) to share costs and identify funding opportunities for natural asset retention, restoration, and enhancement.

- Development incentives: accelerated approval processes, density bonus for developments that integrate green infrastructure or retention and use of natural assets / eco-system services above what is required, or a reduction in DCCs for developments which include green infrastructure (see next bullet point).
- DCC amendment consideration: where a DCC eligible project that meets the requirements of a capital cost supporting an eligible green infrastructure service, and where restoration and enhancement will service the development in which the charge is imposed (as opposed to applying to engineering assets only), allow for a reduction in DCCs.

**2.9** Look for opportunities in private-public partnerships to implement green infrastructure pilot or demonstration projects for design, construction and management of projects that integrate green infrastructure. Explore, evaluate and identify the additional tools, resources, funding and programs that best fit the City to support implementation of green infrastructure with development. Some options may include:

- Performance Targets and User Fees for Development Types.
  - *performance targets that support objectives to create liveable neighborhoods and reasonable access to green spaces for future residents, business owners, and visitors.*
  - *user fees or off-site compensation requirements (i.e. obtain credits for reduced runoff - to be implemented with a stormwater user fee system).*
- Incentive Based Tools.
  - *consider rebates to home owners (one-time payment) for installation of targeted green infrastructure elements.*
  - *tax incentives/tax credits or Payments for Eco-system Services (PES) in exchange for*

*protection or Improved management and stewardship of natural assets.*

- Regulatory and Cost Sharing.
  - *explore green infrastructure utility and amenity charges for servicing requirements, off site local community facilities for both stormwater management, open space natural areas, and urban landscaping requirements for liveable neighborhoods and connections to meet municipal objectives related to safety, health, sustainability, energy, etc.*



## ACTION AREA 3:

# Establish Greenscaping Standards



### RATIONALE:

*Future shocks and stressors may have a growing impact on the City in the coming decades. Adapting policy and implementation of new green infrastructure initiatives now is a smart future investment. With these changes come multiple benefits, a healthier City, and more attractive places to live and do business.*

#### Departments Involved:

- Planning, Parks Planning & Development, Engineering, Parks Operations, Information Technology, Operations, Finance

### 3.1 Prepare a Landscape Design Standards for City Streets and Public Realm.

- Establish rainwater and landscape integrated management targets with quantifiable metrics.
- Include aesthetic/social value as part of the design standards.
- Include diverse selection of green stormwater infrastructure treatments for streets - rain gardens & infiltration bulges / bioswales, pervious paving, and infiltration trenches.
- Establish maintenance and monitoring programs.
- Allocate secured funding for the operations and maintenance of assets.
- Track performance and incorporate lessons learned.

### 3.2 Increase the City's tree canopy and landscaping, in particular, in areas of the City identified as having a low tree canopy coverage (<30%) and areas with high impervious (a low capacity for infiltration) surface area (>40%). This should focus on:

- Tree Retention.
- Onsite/Off-site options (where development occurs).
- Tree Replacement.

- Life Cycle Management.
- Landscape Design Standards.

Consider moving towards a municipal urban forest management plan to help manage municipal forest assets, street trees, and to achieve municipal and community performance targets, and replanting objectives in a more comprehensive & timely manner.

### 3.3 Identify new programs, initiatives and stewardship opportunities for private residential lots to maintain or improve landscaping, reduce stormwater run-off and build the City's Green Infrastructure Network- options may include:

- One time tax rebates programs to home owners for low impact development.
- Tax incentives/tax credits or Payments for Eco-system Services (PES) in exchange for protection or improved management and stewardship of natural assets identified in the City's Green Infrastructure Network.
- Encourage volunteer stewardship of natural assets.
- Tree programs for home owners (discounted nursery stock) to increase tree canopy cover in areas that have been identified as deficient within the Green Infrastructure Network.

## ACTION AREA 4:



# Engage and Build Awareness within the City and in the Community

### RATIONALE:

*The success of building green infrastructure into the City's standard toolkit relies heavily on its acceptance and support within the community. As such, it is important that residents are fully engaged, understand and value the benefits of green infrastructure in the City, now and for its future livability, health and resilience.*

#### Departments Involved:

- Planning, Communications

**4.1** Identify resources, new potential staff positions and training needs required to support implementation of the green infrastructure strategy.

**4.2** Coordinate a green infrastructure outreach, education and awareness program targeting the development community, public and other stakeholders, this may include:

- Green infrastructure webpage.
- Green infrastructure brochure.
- Public meetings and workshops.
- Info-sharing and fact sheets through webpage.
- Guided tours of existing green infrastructure assets.
- Green infrastructure network layer on Ridgeview online mapping.
- Partnership programs, local volunteer and stewardship opportunities.

**4.3** Further connect and develop partnerships with local groups, neighbouring jurisdictions and governments, such as, Metro Vancouver, neighbouring First Nations communities and municipalities, UBC Malcom Knapp Research Forest, Ministry of Forests (Woodlots), Tourism BC, local stewardship groups, etc.

- To protect important areas.
- Share data and align green infrastructure initiatives.

- Work with local groups on stewardship and restoration of critical sites.
- Other:
  - deliver community-based initiatives and partnerships delivered through non-profit community organizations.
  - apply for Provincial and Federal funding to support new green infrastructure assets.
  - partnerships with federal and provincial agencies on programs like Backyard Habitat Planting, Adopt a Park, Community Gardens, Pollinator programs, Songbird and Raptor programs, Ongoing investment in Wildsafe BC education program including Bear Aware.



# Strategy Implementation

*Actions in this strategy require clear implementation to move forward. At such time that this management strategy has been endorsed by Council, it will be the role of staff, the Environmental Advisory Committee and the Internal Inter-Department Task Force to confirm the implementation plan and move forward on action areas outlined through annual business planning.*

The following table outlines actions and priorities. The table includes level of effort, timing, recommended priority and departments involved for all tasks within each action area. Some of the tasks have been identified as relatively low effort and considered quick wins, others require additional consideration, complexity and resources and may take a longer time for implementation. This is reflected as follows.

## LEVEL OF EFFORT REQUIRED

- *Low effort* – can be completed internally with little to no funding, requires limited inter-department collaboration.
- *Medium effort* – primarily can be completed internally, with additional time/budget or contracted work. Involves higher level of multi department input and possible moderate funding requirements for external assistance or contracts.
- *High effort* – managed internally. Involves multi-department collaboration and higher level support between departments, with external assistance and ongoing support from Corporate Management Team and Council.

## TIMING FOR IMPLEMENTATION

- *Short term*: within 1 – 3 years
- *Medium*: within 4 – 7 years
- *Long*: within 8 years or more
- *Ongoing*

## RECOMMENDED PRIORITY

The recommended priority outlines key action areas and tasks that might be prioritized as foundational items in order to move forward with green infrastructure in the City.

- *Low* – can be completed independently or as part of general business planning.
- *Medium* – an important aspect or component of building green infrastructure, but does not have to happen immediately in order to ensure implementation of green infrastructure actions within the City. Requires scoping report and RFP.
- *High* – identified as a foundational component to the implementation of the green infrastructure strategy and success of building green infrastructure in the City. Timing important.

## DEPARTMENTS INVOLVED

As part of the internal inter-departmental task force, it is important to note that a successful green infrastructure strategy requires full support from various departments, senior management, and Council, as well as careful coordination of resources. This column outlines the key departments involved in the task. Staff will determine who will take the lead and responsibility for outcomes as each task is implemented.

ACTION AREA & TASKS	LEVEL OF EFFORT	TIMING	RECOMMENDED PRIORITY	DEPARTMENTS INVOLVED
<b>Action Area 1: Inventory &amp; Value the City's Natural Assets</b>				
Identify green assets (mapping)	Medium	Short	High	<ul style="list-style-type: none"> <li>• Parks, Recreation and Culture</li> <li>• Planning</li> <li>• Information Technology</li> <li>• Engineering</li> <li>• Operations</li> <li>• Emergency Services</li> <li>• Economic Development</li> </ul>
Natural Asset and Ecological Management Strategy (evaluation of natural capital services)	Medium	Short	High	<ul style="list-style-type: none"> <li>• Planning</li> <li>• Parks, Recreation and Culture</li> <li>• Information Technology</li> <li>• Engineering</li> <li>• Finance</li> <li>• Operations</li> <li>• Economic Development</li> </ul>
Develop a Municipal Asset Management Policy which includes new policy language with a focus on natural assets and natural capital evaluation opportunities	Medium	Medium	Medium	<ul style="list-style-type: none"> <li>• Finance</li> <li>• Engineering</li> <li>• Planning</li> <li>• Parks, Recreation and Culture</li> <li>• Information Technology</li> </ul>
<b>Action Area 2: Encourage and Support Green Development and Neighbourhoods</b>				
Coordinate a GI Design Charrette for certain urban infill areas to encourage more innovative design, integration of green infrastructure design options, and cost benefit analysis at site, street & block level	Medium	Short	High	<ul style="list-style-type: none"> <li>• All (Inter-department Task Force)</li> <li>• EAC</li> <li>• Stakeholders</li> <li>• Development Community</li> <li>• Public</li> </ul>
OCP Amendment & Area Planning – review and incorporate GI objectives (& targets)	Low	Ongoing	High	<ul style="list-style-type: none"> <li>• Planning</li> </ul>
Develop GI Design Standards & Performance Targets (servicing and streets )	Medium	Ongoing	Medium	<ul style="list-style-type: none"> <li>• Planning</li> <li>• Engineering</li> <li>• Building</li> <li>• Parks</li> <li>• Operations</li> <li>• Information Technology</li> </ul>
Set Performance Targets for various development types & accountability	Medium	Short	High	<ul style="list-style-type: none"> <li>• Planning</li> <li>• Engineering</li> <li>• Building</li> <li>• Operations</li> </ul>
Explore Development Permit Area	Medium	Medium	Medium	<ul style="list-style-type: none"> <li>• Planning</li> <li>• Engineering</li> <li>• Parks, Recreation and Culture</li> <li>• Finance</li> </ul>

<b>ACTION AREA &amp; TASKS</b>	<b>LEVEL OF EFFORT</b>	<b>TIMING</b>	<b>RECOMMENDED PRIORITY</b>	<b>DEPARTMENTS INVOLVED</b>
<b>Action Area 2: Encourage and Support Green Development and Neighbourhoods (continued)</b>				
Outline Landscape Management, Maintenance & Design Best Management Practices for green infrastructure in the public realm	Medium	Medium	Medium	<ul style="list-style-type: none"> <li>• Parks, Recreation and Culture</li> <li>• Operations</li> <li>• Planning</li> <li>• Engineering</li> </ul>
Review the Development Procedures and Process for incorporating GI (review process and Bylaw)	Medium	Medium	Medium	<ul style="list-style-type: none"> <li>• Planning</li> <li>• Engineering</li> </ul>
Review / consider incentives and amending the Development Cost Charges Bylaw (DCC Bylaw) to support GI	Low	Medium	High	<ul style="list-style-type: none"> <li>• Planning</li> <li>• Engineering</li> </ul>
Identify private-public partnerships/pilot project & other funding mechanisms	Medium to high	Ongoing	Medium	<ul style="list-style-type: none"> <li>• Various</li> </ul>
<b>Action Area 3: Establish Greenscaping Standards</b>				
Landscape Design Standards for City Streets & Public Areas	Low	Medium	Medium	<ul style="list-style-type: none"> <li>• Parks, Recreation and Culture</li> <li>• Planning</li> <li>• Engineering</li> </ul>
Forest / Tree Operations & Management Plan for Municipal forests/trees	Medium	Long	Medium	<ul style="list-style-type: none"> <li>• Parks, Recreation and Culture</li> <li>• Information Technology</li> <li>• Planning</li> </ul>
GI Residential Programs, Incentives and Stewardship Opportunities	Medium	Ongoing	High	<ul style="list-style-type: none"> <li>• Parks, Recreation and Culture</li> <li>• Planning</li> <li>• Communications</li> </ul>
<b>Action Area 4: Engagement and Build Awareness</b>				
Internal Education and Training	Medium	Ongoing	High	<ul style="list-style-type: none"> <li>• All</li> </ul>
Green infrastructure Education & Outreach Initiatives	Medium	Medium	Medium	<ul style="list-style-type: none"> <li>• Planning</li> <li>• Communications</li> </ul>
Identify key partnerships (academic, regional, etc.)	Low	Ongoing	Medium	<ul style="list-style-type: none"> <li>• Planning</li> </ul>

## Stakeholders and Green Infrastructure Inter-departmental Task Force

Maintain and set regular meeting dates to continue the Green Infrastructure Inter-departmental Task Force Group to focus on support for short term action items. The Inter-departmental Task Force will be responsible for monitoring the progress of Actions and tracking the phasing and prioritization of related tasks within other departments.

# Appendices

Appendix A:  
Project Background

Appendix B:  
Risks

# Appendix B: Risks

The Green Infrastructure Management Strategy is just one step towards furthering green infrastructure in the City. Continual effort is needed to ensure the success of each action with the strategy. The following risks and mitigation strategies represent challenges identified by staff and stakeholders to the implementation of this management strategy.

RISK	MITIGATION
Silo Departments	<ul style="list-style-type: none"> <li>Regular communication through the Internal Staff Task Force Group</li> <li>Council involvement</li> <li>Environmental Planning Champion</li> </ul>
Lack of Uptake in the Development Community	<ul style="list-style-type: none"> <li>Provide information and consult with the development community</li> <li>Identify key partners</li> <li>Identify key development incentives for green infrastructure</li> </ul>
Lack of budgets or staff to support green infrastructure initiatives	<ul style="list-style-type: none"> <li>Grant applications</li> <li>Partnerships with Metro Vancouver (i.e. sharing data), neighbouring communities, academic institutions</li> </ul>
Lack of Community Support and Partnerships	<ul style="list-style-type: none"> <li>Regular communication on green infrastructure initiatives and progress</li> <li>Identify pilot projects and relevant community groups to support community-based initiatives</li> <li>Involve community leaders</li> </ul>
Existing policy remains unchanged	<ul style="list-style-type: none"> <li>Policy review included as tasks within action areas</li> <li>Council update, endorsement and staff recommendation to implement tasks outlined</li> <li>Internal Staff Task Force to track and monitor</li> </ul>
Risk of ongoing impacts and costs of not incorporating green infrastructure on residents (taxpayers) and the City's systems	<ul style="list-style-type: none"> <li>Council support and leadership</li> <li>Resident and development community engagement</li> <li>External partnerships (regional, academic, etc.)</li> </ul>

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Maple Ridge Green Infrastructure Feedback from EAC and GISC Members

	Overall, do you support the Green Infrastructure Management Strategy study moving forward? - Agree / Disagree?	Do you support the six (6) action items outlined by the consultant EcoPlan in their report (below)? Specifically: Do you disagree with any of the suggested actions? Would you change any of the suggested actions? If yes please provide comments. Would you add any specific action items?	What action items or next steps, are most important to you in the short term (3-5 years)? Rank 1-6	What do you believe would be the primary reason that the GI Management Strategy might fail in moving forward?
<b>(EAC) Voting Member 1</b>	Yes. I support the strategy in it's entirety	<p>The City should also be commencing work on all of the recommended studies &amp; incremental action items concurrently to work towards the various goals identified in the report</p> <p>Continue to learn from others. Already a lot of good work that has been done by other cities and experts. The Greenscaping standards - these exist - this should be more research and gathering to understand, implement, and potentially embed in policy, regs, standards etc.</p> <p>Develop a big bold long term GI vision that cannot be easily altered by changes to staff and or Council, embed it in policy, regulations and best practices for all depts. Enroll stakeholders across the City.</p>	<p>The goals and priorities are good and should be done concurrently vs in order.</p> <p>First step however is to complete the inventory and identify the values or benefits associated with natural assets Understand what we are managing, what services it provides and how we are doing.</p> <p>Also part of the first step, broad scale education needs to begin immediately. Continue with programs like guest speakers and design charrettes to inform and educate all stakeholders</p>	<p>What will prevent Maple Ridge from becoming a world leader amongst cities of similar size will be not starting with the end goal in mind. We need to start this vision and work now.</p> <p>As MVH said, do nothing that is not a net gain for both the environment and the community with new development.</p> <p>Using the end goals of liveability, resiliency, vibrancy and affordability as the lens to which every single thing the City does and is measured through - without waivering or exception. If other cities around the globe can do it, we can too!</p>

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(EAC) Voting Member 2	Yes	<p>I support the 6 action items as listed.</p> <p>I have fully reviewed the documents. I believe that the documents clearly state the reasons why we need a GI strategy and provides some good strategies for moving forward.</p> <p>One thing that I would like to see changed is a focus on the urgency of implementing a green strategy. Regardless of your views on whether climate change is caused by humans or a natural occurrence, it is changing at a rapid rate and is having a major impact on the environment including the infrastructure of our towns and cities. The time is now for implementing change.</p> <p>I personally would like to see more of a move away from wording such as “encourage”, “possibly incentivizing” and “ Look to incorporate” and replace with a</p>	<p>I believe the order in which the next steps are listed is correct as to their level of importance. As for the first step I think that most of the focus should be on providing the tools and capacity for green infrastructure. If there are decision makers, senior managers and heads of departments within City Hall who are not aware of the need for a Green infrastructure strategy, how climate change currently affects the City, their department, or citizens and how it will affect their departments in the future, or if they are resistant to implementing this type of strategy immediately, they should be replaced with ones that do.</p> <p>Everyone is concerned about the impacts associated with climate change, densification, and loss of the natural environment. It is a priority. It is time to make some hard decisions and deal with the</p>	<p>In my opinion there are several reasons why the Strategy could fail in moving forward and to no surprise they are not new. The first and foremost is an ill informed and apathetic public. If council perceives that there is little interest from the public in implementing and supporting the cost of a GI Strategy they wont support it.</p> <p>The second is push back from developers. While I have not been a part of the discussions with developers, I spent several years working in the Real Estate Divisions of two large BC retail organizations and I am pretty sure I know what their issues are.</p> <p>One of the things I like about the strategy is the suggestion in offering incentives for developments that integrate green infrastructure. Aside from these incentives, I think the City should make a big deal about</p>

## Maple Ridge Green Infrastructure Feedback from EAC and GISC Members

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		detailed time frame, stronger performance targets and requirements for implementation. I am aware of the issues involved with doing this but I believe that the time is now for bold action	necessary changes and meet the challenges. My observations on some key and controversial development issues in Maple Ridge have not given me much faith that there is a strong will or desire within departments or in City Hall to do the right thing in a timely manner, and strongly challenge the conventional thinkers and practitioners I hope I am wrong	<p>developers who proactively offer substantial GI options in their projects. They could be recognized with full page ads in the local paper with acknowledgement from council on their truly green project. This would not only give them public\positive recognition it would help promote their project and show other developers that MR is serious about GI. The third is internal resistance to change. While council may believe that they manage the city, in reality the city is run by the bureaucrats and if they are not on side with the concept it is doomed to failure.</p> <p>Last but not least is lack of leadership i.e. Council support. While I believe that the majority of Maple Ridges current council are intelligent, educated and dedicated people, and have all made statements as to the importance of sustainability\climate</p>

**Maple Ridge Green Infrastructure Feedback from EAC and GISC Members**

	Overall, do you support the Green Infrastructure Management Strategy study moving forward? - Agree / Disagree?	Do you support the six (6) action items outlined by the consultant EcoPlan in their report (below)? Specifically: Do you disagree with any of the suggested actions? Would you change any of the suggested actions? If yes please provide comments. Would you add any specific action items?	What action items or next steps, are most important to you in the short term (3-5 years)? Rank 1-6	What do you believe would be the primary reason that the GI Management Strategy might fail in moving forward?
				change, they appear to be reluctant to support anything that would potentially negatively affect development in MR and I sincerely hope they recognize the importance of this work for the larger community & future generations.
<b>(EAC) Voting Member 3</b>	YES I support the GIMS moving forward	I also support the 6 action items and believe that obtaining data/conducting mapping to support the green infrastructure implementation and valuing the City's Existing Natural Assets are high priorities (it's hard to protect or talk about until you know where and what it is). Mapping and valuing the Natural Assets would feed into vulnerabilities and helping to determine where the City's Level of Resilience can be improved as part of an overall strategy to combat climate change and other stressors.	The other actions are also important so it's hard to rank them as they need to become the norm and happen simultaneously.	If the strategy fails in moving forward, it's likely due to fear of new processes and potential unfamiliar/untried ways of doing things and the associated costs. Hopefully there is enough information to understand what the costs are of not moving ahead with this work in the long run? Cumulative knowledge from other jurisdictions and even from within Maple Ridge to provide a good level of comfort to at least move forward.

**Maple Ridge Green Infrastructure Feedback from EAC and GISC Members**

	Overall, do you support the Green Infrastructure Management Strategy study moving forward? - Agree / Disagree?	Do you support the six (6) action items outlined by the consultant EcoPlan in their report (below)? Specifically: Do you disagree with any of the suggested actions? Would you change any of the suggested actions? If yes please provide comments. Would you add any specific action items?	What action items or next steps, are most important to you in the short term (3-5 years)? Rank 1-6	What do you believe would be the primary reason that the GI Management Strategy might fail in moving forward?
<b>(EAC) Voting Member 4</b>	Yes, I fully agree with and support the Green Infrastructure Management Strategy study moving forward!	Yes, I fully support the six (6) action items outlined by the consultant EcoPlan in their report.	<ol style="list-style-type: none"> <li>1. Build the City's Level of Resilience (to the changing climate and other shocks and stressors)</li> <li>2. Value the City's Existing Natural Assets in Municipal Financial and Business Planning</li> <li>3. Encourage and Support "Green" Development</li> <li>4. Obtain data and conduct mapping to support green infrastructure implementation in the City</li> <li>5. Build internal knowledge, coordination, tools and capacity for green infrastructure</li> <li>6. Engage and Build Awareness in the Community</li> </ol>	<p>-Lack of moving forward on the action items in a time-effective manner.</p> <p>These are action items that need to be implemented quickly and efficiently to maximize cost savings and minimize climate change effects.</p>

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	Overall, do you support the Green Infrastructure Management Strategy study moving forward? - Agree / Disagree?	Do you support the six (6) action items outlined by the consultant EcoPlan in their report (below)? Specifically: Do you disagree with any of the suggested actions? Would you change any of the suggested actions? If yes please provide comments. Would you add any specific action items?	What action items or next steps, are most important to you in the short term (3-5 years)? Rank 1-6	What do you believe would be the primary reason that the GI Management Strategy might fail in moving forward?
<b>(EAC) Voting Member 5</b>	I strongly support the Green Infrastructure Management Strategy.	I strongly support all six of the action items.	Two that stand out for me are the mapping and data collection (you can't protect what you don't know about) and the community awareness. While I can't really rank the six items 1-6, I see these going on concurrently in the next 3-5 years, with efforts to inform the community happening concurrently with the behind the scenes stuff.	I feel that efforts to inform and engage may help mitigate against the reason this would be most likely to fail, that being fear of the unknown and falling back into familiar comfort zones.
<b>(EAC) Voting Member 6</b>	I support the Green Infrastructure strategy.		I think would rank the items as follows: <ol style="list-style-type: none"> <li>1. Encourage and Support "Green" Development (however this should be Require),</li> <li>2. Obtain data and conduct mapping to support green infrastructure implementation in the City, and</li> <li>3. Engage and Build Awareness in the Community</li> </ol> as the highest priorities (in order) and should be undertaken immediately (1-3 years). Value the City's Existing Natural Assets in Municipal Financial and	

Maple Ridge Green Infrastructure Feedback from EAC and GISC Members

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			<p>Business Planning is an extension of item two, and should commence once resources are mapped. Build internal knowledge, coordination, tools and capacity for green infrastructure requires internal training/hiring, and is a pre-requisite for Build the City's Level of Resilience (to the changing climate and other shocks and stressors). I would think all of these items should be addressed in the short term (3-5 years).</p>	

## Maple Ridge Green Infrastructure Feedback from EAC and GISC Members

	<p>What top 5 concerns or impacts do you have about following current urban design &amp; development practices for urban infill areas (i.e. Town Centre / Major Transportation Corridors) and for greenfield development areas in Maple Ridge (i.e. Silver Valley)?</p>	<p>What are the top 5 challenges that you think need to be addressed for successful integration and implementation of green infrastructure in Maple Ridge in the next few years (i.e. 1-15 years)?</p>	<p>What are the top 5 priority Green Infrastructure (GI) opportunities and/or action items that you think are important for successful GI implementation for both urban infill areas and for green field development urban areas in the short term (i.e. 5-15 years)?</p>
<p><b>(GISC) Member 1</b></p>	<p>Agricultural lands are not pulling their weight or faced with the same requirements as developers, even if directly adjacent.</p> <p>ALC should be included and required to face the same requirements and regulations as developers or civil works, not only to be equitable, but also to increase the balance of positive efforts vs historic practises that cause more damage than good.</p>	<p>The main challenge as a developer is the lack of calculatable or measurable instruction from the City on how to reach certain targets or goals through the development process.</p> <p>If a clear outline of requirements and measurable results was available at scale, estimating costs and ensuring equitable and sustainable practises would be much more straightforward.</p>	<p>The action item that has stayed with me from our video presentations, is the double treed sidewalks that create a shaded and green surround amenity for the public.</p> <p>This method not only provides a natural buffer to traffic (between the curb and sidewalk) but also helps reduce temperatures on hot days, increases green view, and helps relieve air congestion from traffic and the like. I support this action item as a developer because it can be implemented easily and improves the look and feel of each neighbourhood.</p> <p>As new high-density clusters rise up in the downtown area, the center and connective pathways should be pedestrian focused, linking each building and retail strip, with parking and car roadways secondary to pedestrian use.</p>

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	<p><b>What top 5 concerns or impacts do you have about following current urban design &amp; development practices for urban infill areas (i.e. Town Centre / Major Transportation Corridors) and for greenfield development areas in Maple Ridge (i.e. Silver Valley)?</b></p>	<p><b>What are the top 5 challenges that you think need to be addressed for successful integration and implementation of green infrastructure in Maple Ridge in the next few years (i.e. 1-15 years)?</b></p>	<p><b>What are the top 5 priority Green Infrastructure (GI) opportunities and/or action items that you think are important for successful GI implementation for both urban infill areas and for green field development urban areas in the short term (i.e. 5-15 years)?</b></p>
<p><b>(GISC) Member 2</b></p>	<p>1. Failure to protect existing trees from full site clearing – without exploration of alternatives.                  2. Lack of coordination between arch/civil/landscape on finding creative ways to protect and enhance existing green infrastructure                  3. Without a formal policy or a guideline – development will continue in its current fashion that could have irreversible consequences for community resources like Trees/streams/salmon</p>	<p>a. Bringing developers together with the consulting team and having meaningful and reasonable discussion around financial goals and environmental goals of the project.                  b. Ensuring that there is a coordinated effort from architecture with Landscape and with civil to bring fruitful ideas to the planner for consideration                  c. Reversing the existing approach to development that looks to maximize units for a site.</p> <p>What other incentives might be offered to reduce units or to reduce footprint of a development? Can developers achieve rezoning with experimental type ideas that may result in greater vertical height or density if significant community green infrastructure is protected?</p>	<p>a. Establish a process for talking about protection of GI and bringing the development community to the table with reasonable incentives or flexibility to help achieve both financial viability and environmental protection.                  b. Require development to follow “Salmon safe” approach – present a strategy for each site to protect fish habitat.                  c. Consider ‘experimental zoning’ in areas of MR that are highly sensitive in terms of riparian areas and habitat. Perhaps developers could present ideas to achieve density and protect resources in these areas?                  d. Ensure that Arborists, landscape architects, architects, and engineers have a conference with planners to discuss opportunities and constraints for the site – unbridled by purely economic goals for the site.</p>

**Maple Ridge Green Infrastructure Feedback from EAC and GISC Members**

	<p>What top 5 concerns or impacts do you have about following current urban design &amp; development practices for urban infill areas (i.e. Town Centre / Major Transportation Corridors) and for greenfield development areas in Maple Ridge (i.e. Silver Valley)?</p>	<p>What are the top 5 challenges that you think need to be addressed for successful integration and implementation of green infrastructure in Maple Ridge in the next few years (i.e. 1-15 years)?</p>	<p>What are the top 5 priority Green Infrastructure (GI) opportunities and/or action items that you think are important for successful GI implementation for both urban infill areas and for green field development urban areas in the short term (i.e. 5-15 years)?</p>
<p><b>(GISC) Member 3</b></p>	<p>a. Loss of significant trees                      b. Increase in impermeable surfaces                      c. Increased density without an increase in amenity spaces and places for the increased population on site and off-site                      d. Lack of streetscape improvements and tree planting for necessary increase in canopy cover and accommodation of pedestrian street amenities                      e. Pedestrians should be first and SOV last.</p>	<p>a. Perceived additional costs of environmental improvements born by the developers                      b. Engineering push back on street greenfrastructure design and innovations                      c. Cost of land                      d. Affordability first and environment second                      e. Community and development values of trees and streams</p>	<p>a. Mandatory Green checklist                      b. Create requirements for “Net Environmental and Community Gain” with development applications                      c. Citywide and Neighbourhood Greenways Plan                      d. Green demonstration projects like Yennadon Neighbourhood Employment Area Green Plan                      e. Green Streets and Stewardship Program</p>

**Maple Ridge Green Infrastructure Feedback from EAC and GISC Members**

	<p><b>What top 5 concerns or impacts do you have about following current urban design &amp; development practices for urban infill areas (i.e. Town Centre / Major Transportation Corridors) and for greenfield development areas in Maple Ridge (i.e. Silver Valley)?</b></p>	<p><b>What are the top 5 challenges that you think need to be addressed for successful integration and implementation of green infrastructure in Maple Ridge in the next few years (i.e. 1-15 years)?</b></p>	<p><b>What are the top 5 priority Green Infrastructure (GI) opportunities and/or action items that you think are important for successful GI implementation for both urban infill areas and for green field development urban areas in the short term (i.e. 5-15 years)?</b></p>
<p><b>(GISC) Member 4</b></p>	<ol style="list-style-type: none"> <li>1. Primarily with the way we put all storm drainage into pipes especially within city rights of way. In a majority of cases where developments occur that have creative storm drain systems with day-lighting, above ground water features, plants etc., they nearly always end up in a pipe or underground on the city side of the development.</li> <li>2. Use of impermeable surfaces. Even if parking lots had planted swale system within them. See casino parking lot at 227th and Lougheed Hwy. Consider multiple uses and benefits ie. Fields for Kids parking lot at 104th Ave. Sometimes we have to set examples.</li> <li>3. Our Transit stops are not very inviting places, little if any green or human scale around them.</li> <li>4. We have a lot of water that falls that should and could be stored and re-circulated for watering, private and public spaces with innovative landscaping drainage practices.</li> <li>5. I think we are doing a fairly good job of protecting our waterways, however they are used for dumping</li> </ol>	<ol style="list-style-type: none"> <li>1. We need to find what works best to suit our landscapes with a proper cost, benefit and savings analysis, in c-operation with all departments – each will have a role.</li> <li>2. Once appropriate systems are chosen then City Engineering Standards must be addressed. There is an aversion by the Engineering Department to move away from the norm and try new innovative approaches. This risk avoidance has met a number of criteria of City policies and practices, especially avoiding claims.</li> <li>3. Buy in from developers, builders and the public especially where there is a cost associated with the innovation that will they will have to pay. How will it affect the affordability issue that’s at the fore-front of politicians and the public. Cost may be added to a development but they are always passed onto the consumer, Is there a method of D.C.C. forgiveness or an additional D.C.C. charge for the public works, maintaining or adding these innovations into developments or to the developers list of requirements. Is the public prepared to accept the costs, or will they understand the savings.</li> <li>4. The introduction of G.I. in an area will have to be well thought out an how or when</li> </ol>	<ol style="list-style-type: none"> <li>1. One of the main action items that should be undertaken is the effects of Global Warming at a local level. People need to understand how our landscapes and ecosystems maybe or will be affected without action. The Melbourne examples of cisterns, swales and greenways was a good example of keeping the urban area green.</li> <li>2. I realize this maybe a monumental task but understanding Global Warming at a local level is virtually important to understanding Green Infrastructure.</li> <li>3. We need to see where day-lighting of engineered storm system may be undertaken and apply G.1 practices to the day-lighting system.</li> <li>4. What are fair compensations for adding to an areas G.I System. One property may give nothing in terms of land while another may have to contribute more than 50%. Can we set a number that all lands contribute 5% those that do not give dollars. What amounts are fair?</li> </ol>

## Maple Ridge Green Infrastructure Feedback from EAC and GISC Members

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	<p>our storm water . The City usually includes pre-development and post development flow requirements, but there does not seem to be a system of scrubbing or collecting water before entering streams. Insufficient performance in dealing with water quality. Filtration or transpiration system can help improve the water quality before entering the natural systems.</p>	<p>can it spread into surrounding areas. Part of this is a land use planning issue, there are areas immediately around the downtown core that have been designated as having relatively low density (duplex, triplex, possible townhouses) potential. Most of the land around the edge of the core area has larger lots (8,000 – 10,000 sq. Ft.) and have great potential for assembly for condominiums. Setting G.I. standards for those lands with higher density has a greater opportunity to succeed. Introduce standards with density.</p> <p>5. As we have progressed in our planning advances in the last 2 decades we have also deduced the buildable areas available. Not saying that these are bad, but we have some fairly good setbacks from waterways and have done a fair job of negotiating with developers for more with density bonusing, D.C.C. forgiveness etc. We have also seen set backs on the Urban Edge from A.L.R. lands, forest edges and slopes. G.I. has potential or is likely to take more of the known buildable area, so how do we justify, is it through increased density, D.C.C.'s or other tools that achieve buy in.</p>	

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<p><b>GISC Member 5</b></p>	<p>Losing more and more natural assets due to development                      The public is looking for increased parking spaces downtown, while we should be aiming for a more “pedestrian friendly” Town Centre                      Adaptability to climate change                      Ability to finance Green Infrastructure Plan                      Ability of staying “ahead of the curve”; ie management and maintenance of GI design &amp; development practices</p> <p>Mind you I’m convinced:                      Benefits will be plentiful and increase quality of life: health, cultural, water quality, recreation, wildlife habitat.....                      Continuous community engagement and participation is absolutely critical to ensure the inclusivity, multi-functionality and clarity about the utter importance of Green Infrastructure</p>	<p>Losing natural assets due to development and density                      Need to complete and update the City’s mapping and data of GI assets inventory                      Need to integrate green infrastructure into Town Centre and Lougheed Corridor(streets, parking areas ) and identify the opportunities                      Encourage people to be “one car family” and increase “pedestrian friendly” areas (BIG challenge to entice people out of their car!)</p>	<p>Asses natural assets across our municipality and establish a clear and understandable local natural assets inventory                      Try to identify, manage and use our present natural assets                      Figure out risks of present assets                      Develop operations/management plan with CLEAR policy &amp; guidelines                      Develop permit bylaw for developers to preserve present (maybe “hidden”?) natural assets, prior to development                      Development Cost Charges to be extended, to include developer contributions to natural assets (could potentially reduce DCC’s in the future)</p>

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<b>(GISC) Member 6</b>	<ol style="list-style-type: none"> <li>1.) Low permeable surfacing/lack of exposed or accessible topsoils</li> <li>2.) Lack of planning for functional soils to support long term tree growth</li> <li>3.) Engineering requirements or cost of construction often trump mature tree retention</li> <li>4.) Trees retained through planning but then killed during construction due to lack of care</li> <li>5.) Polluted runoff to streams/storm system</li> </ol>	<ol style="list-style-type: none"> <li>1.) Insufficient resources for operations to maintain trees, landscapes and natural areas</li> <li>2.) Insufficient resources for staffing and operations to oversee or supervise construction</li> <li>3.) Lack of detailed standards for design and construction that ensure protection of retained trees and natural areas</li> <li>4.) Inconsistent messaging from departments during development planning</li> <li>5.) Developer expectations for densification is high. There is little appetite to give up land. Need strong and clear performance requirements or regulations around green infrastructure applications</li> </ol>	<ol style="list-style-type: none"> <li>1.) Review and update all bylaws related to natural areas so they are consistent and strengthen each other. The tree bylaw, watercourse protection bylaws, Watercourse Protection DP Guidelines, wildfire DP, and tree risk policy</li> <li>2.) Set targets for tree canopy cover for the City and each neighborhood through an Urban Forest Strategy</li> <li>3.) Bonding that is high enough and extends for long enough for retention of trees and restoration projects. Set substantial penalties for tree impacts during construction</li> <li>4.) Natural soils and microbial communities lost through greenfield development. Salvage natural topsoils and native plants from greenfield developments for restoration projects in natural areas. Provide a storage area to stockpile this resource.</li> <li>5.) Develop restoration guidelines for natural areas that target climate adaptable and drought tolerant plant communities</li> </ol>

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<p><b>(GISC ) Member 7</b></p>	<ol style="list-style-type: none"> <li>1. Allowing variances from OCP, area plans, and City zoning requirements, permeable areas, stormwater requirements, tree retention/replacement areas, and landscaping areas.</li> <li>2. If new urban infill development cannot meet requirements on site, then the City should be considering off site options - shared community spaces with GI facilities that everybody developing pays into to promote more liveable, resilient, affordable urban centres and make up for losses due to impacts from densification. This includes consideration for above ground water features such as retention/detention ponds to help with drainage, cooling of the air, aesthetically pleasing feature for public gathering areas.</li> <li>3. Poor understanding of the value of protecting existing trees which are of greater value</li> </ol>	<ol style="list-style-type: none"> <li>1. Lack of a full understanding of the value of green infrastructure from a quantitative and qualitative perspective. Identify the various kinds of benefits, services, and monetary cost savings it provides</li> <li>2. Lack of awareness of economic benefits as well as cost savings for more vibrant business centre, affordable urban centres, and significant cost savings to the community from larger municipal owned forests that currently support more liveable, healthy, and resilient residential areas.</li> <li>3. Change the misconception that GI should be a secondary consideration vs one of the primary or complimentary drivers especially for development of new neighborhoods.</li> <li>4. City resources (staff, lands, and financial) are limited as we grow. Through densification we can better share costs &amp; longer term impacts with the development community.</li> <li>5. Lack of a firm commitment to action items or implementation items for GI in the short, medium, and long term.</li> <li>6. Lack of a big bold long-term vision.</li> </ol>	<ol style="list-style-type: none"> <li>1. Inventory, measure and value current natural assets and constructed GI elements. Record and acknowledge them within City financials, business plans, and land use decisions as we do other types of municipal assets.</li> <li>2. Consider GI in every single development application and at the street, neighborhood and area level.</li> <li>3. Put people ahead of cars especially in urban infill areas that will become congested soon, think 15-minute City, think multi-mobility.</li> <li>4. Make plans with design charrettes that include a range of both community experts, and external experts including, planners, architects, landscape architects, City staff and Council, Chamber, BIA, developers/builders, and the broader community where possible.</li> <li>5. Develop a big bold long term GI vision that cannot be easily altered by changes to staff and or Council, embed it in policy.</li> <li>6. Demonstrate strong leadership and commitment to the environment and the community.</li> </ol>

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	<p>than smaller replacement trees especially in the urban infill areas as well as valuable more mature forests in greenfield areas.</p> <p>4. Not measuring, evaluating, and incorporating the values of GI, the contribution of GI with all new area plans, or for the larger denser developments. Treat GI like we currently treat parking, as a requirement for all new developments in urban areas with clear performance targets including new multi family, town house developments.</p> <p>5. Ignoring GI when considering commercial industrial expansion, equally critical in these developments, need to do it right.</p> <p>6. Lack of a big bold long-term vision</p>		

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<p><b>GISC)</b></p>			<p>The possibility of “Public Art” to the GI document. Form and Function                      In both the earlier presentations by Mark van der Zalm and Michael von Hausen, Public Art was mentioned – as stand alone pieces that can also contribute to the dialogue (Water features in False Creek, Vancouver) and as part of a urban landscape in recreational uses and drainage design – skateboard area example.</p> <p>When designing GI, as in the case of permeable surfaces of structures surrounding new tree plantings, text could be added (stamped cement?) to highlight the purpose of the plantings or in the case of Maple Ridge’s “Sidewalk Poetry” to give some GI inspirational thoughts.</p> <p>Art and aesthetic design would help to engage the public and community to invest the GI concept.                      Other stand public art commissions could be included by collaborating with the PASC.                      Thank you for the opportunity to engage with the GI committee.</p>

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	Reflecting on each of the draft action areas identified and your professional experience, where do you see quick wins for the City?	Projecting ahead 5-10 years, why did it fail?
(GISC)	Off-site opportunities in developments.	Needs flexibility.
(GISC)	Maple Ridge could improve green network availability. Perhaps using GIS tools on site would help.	Needs clear standards and direction. Competing interests can get in the way such as the fire dept. not approving roads with GI as they want more space for trucks, etc. Departments need to work together rather than become silos on their own
(GISC)	Many positive ideas seen. Would like to see clear goals and check boxes Also would like to see an increase in current processing speed/response time	Lack of clarity in process leads to many developers having already “walked away from Maple Ridge”
(GISC)	Would like to see tree retention. Perhaps City could use incentives such as developments that retain large tree(s) go into a different “green” category and move faster through the process. Have fire dept. at table early on & focus on community enjoyment vs. Public safety. Strong incentives to help development come on board with GI. Encourage vs. Punish Can use calculators to determine amounts of rainwater, etc.	Need to have good collaboration in staff

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<b>(GISC)</b>	<p>Retention of Trees, Tree stands, and Significant Trees on municipal lands and development areas. Create and implement an Urban Forest Management Strategy. (Action Item #5)</p> <p>Assess options to preserve existing natural assets and their services before proposing new built assets to save costs and maximize financial benefits from natural assets, including mature trees. (Action Item #3)</p> <p>Conduct mapping and data collection to support green infrastructure implementation in the City focusing on wetlands, watercourses, fish-bearing streams, forests, and wildlife corridors, (Action Item #2).</p> <p>Create a plan for Green Development coordinating with developers to maximize financial benefits and cost-savings by retaining existing natural assets on site, as well as ensuring adequate protection of them during construction (Action Item #4).</p> <p>Build internal coordination &amp; good communication among City, developers, architecture, etc. to set clear standards for easy implementation for green infrastructure (Action Item #1).</p> <p>Encourage community education on the benefits of implementing green infrastructure through homeowner tree planting incentives and volunteers for care and education of natural asset retention (Action Item #6).</p>	Lack of efficiency in moving forward and implementing action items.
<b>(GISC)</b>	What about areas on outskirts of downtown? If higher density could be had, streams could be day-lighted. Opportunities need to be identified.	The Planning Department needs to be closely involved. City maintenance of blackberries, street trees, etc. needs to be kept up
<b>(GISC)</b>	Urban food systems and urban ecology stewardship such as fruit tree planting incentives & pollinator programs i.e. pollinator plants and beekeeping opportunities. Also would like to see engagement of businesses.	Maintenance needs to be kept up on green infrastructure, trees, etc.
<b>(GISC)</b>	Would like to see involvement of community – citizens, community groups, and private land owners, even in “little ways” such as adopting trees, collecting rainwater, etc.	