City of Maple Ridge

Green Infrastructure Overview

Background and Proposal

June 12, 2019

Background

- What Is Green Infrastructure (GI)?

Green infrastructure has the following characteristics:

Green infrastructure refers to the **natural** vegetation, soils, water, and **bioengineered solutions** that collectively provide society with a broad array of products and services that are crucial to health and livability.

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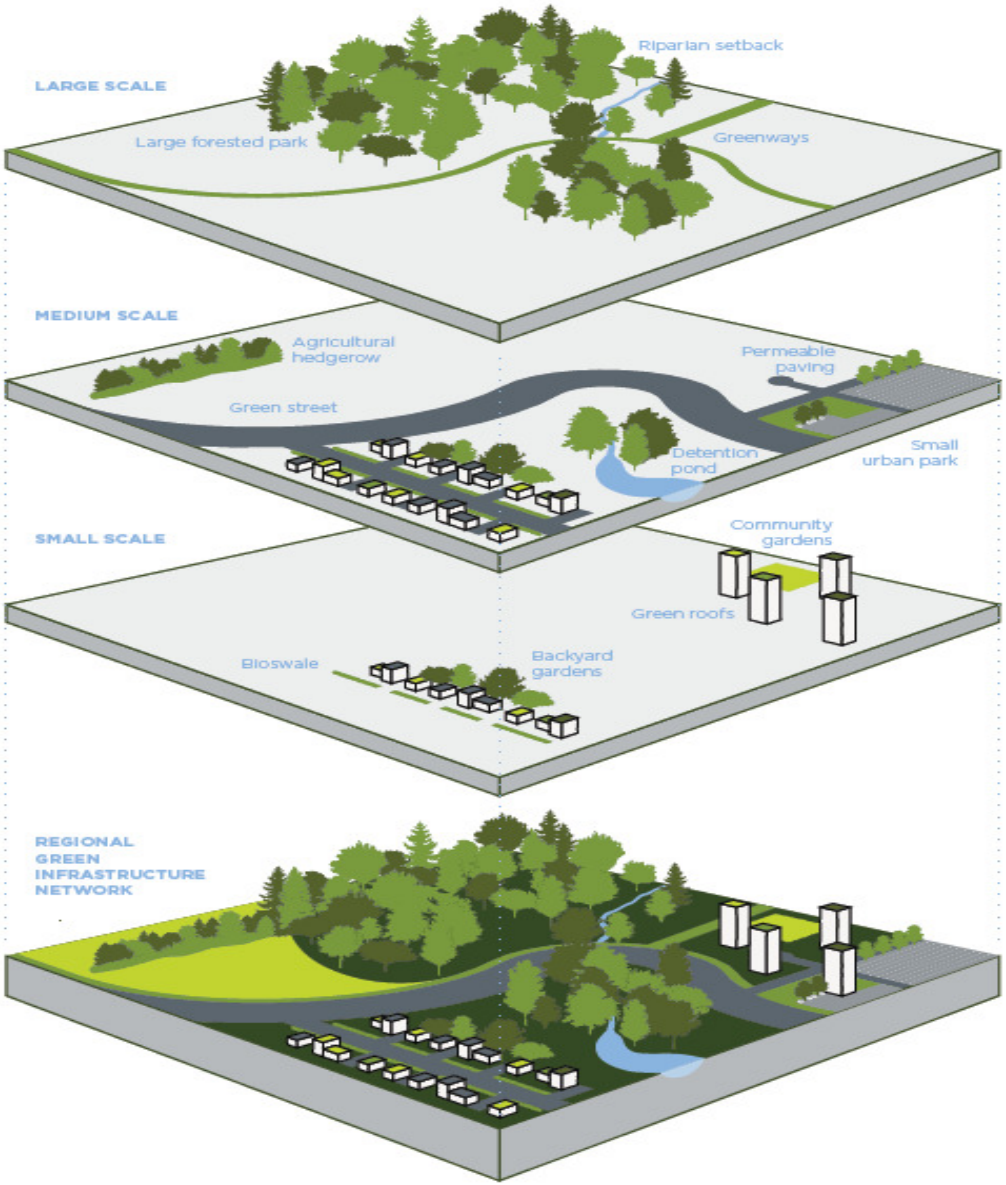
Different Scales & Land Use Applications



Components of green infastructure link together to form a functional network

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Multi Beneficial Solutions For The City

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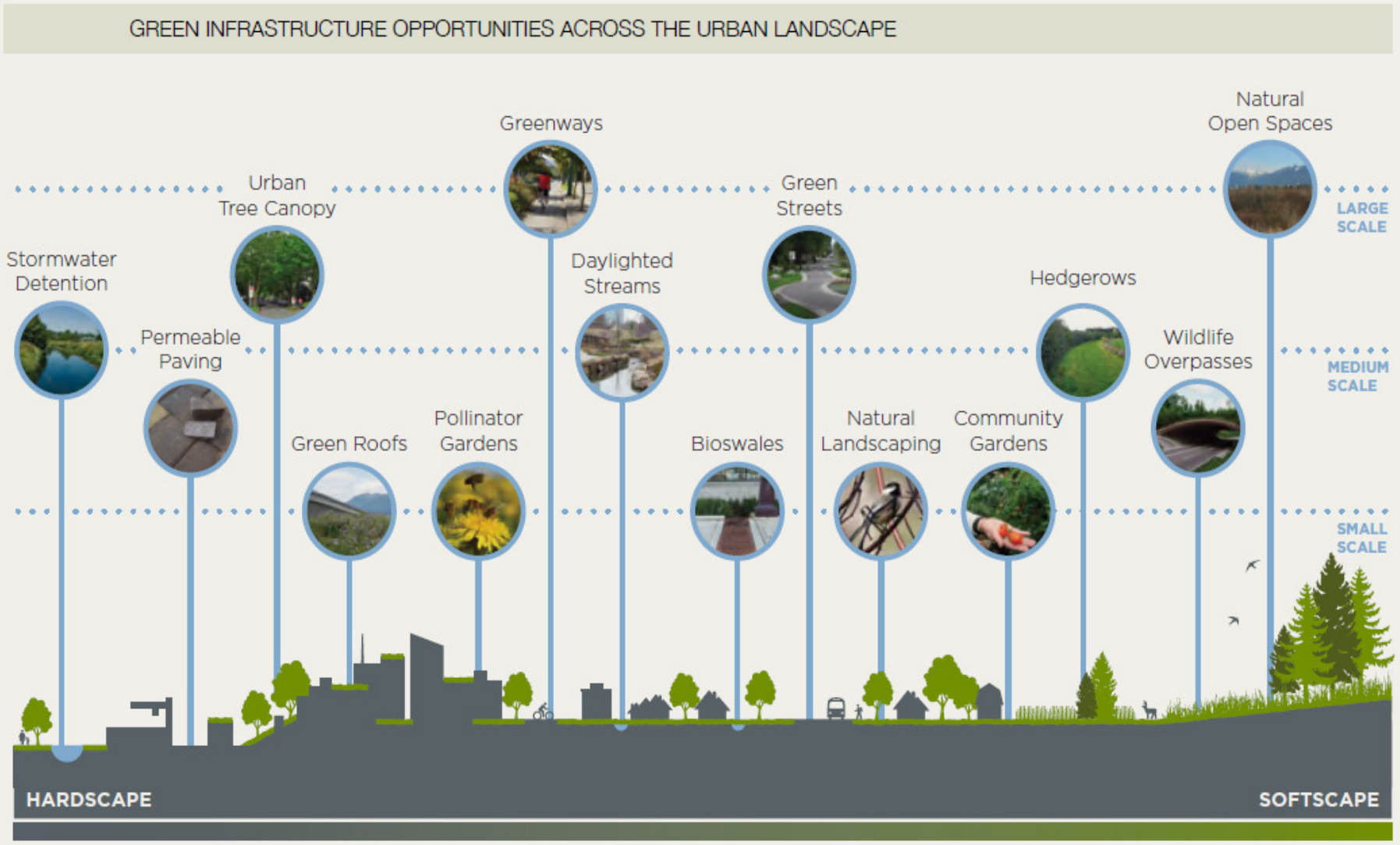
Local Government Applications depends on land use & natural assets



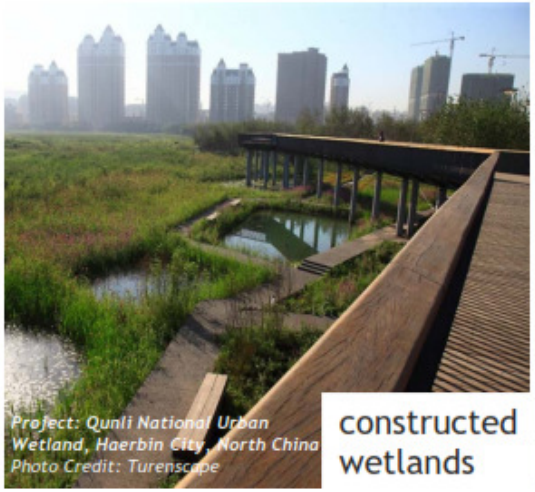
Green Infrastructure Examples

bioswale

rainwater harvesting

daylighting streams

absorbent landscape



constructed wetlands

detention tanks

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Green Infrastructure Examples

tree well structure


rain garden & infiltration bulge


street car

green roof


non-porous asphalt

porous asphalt

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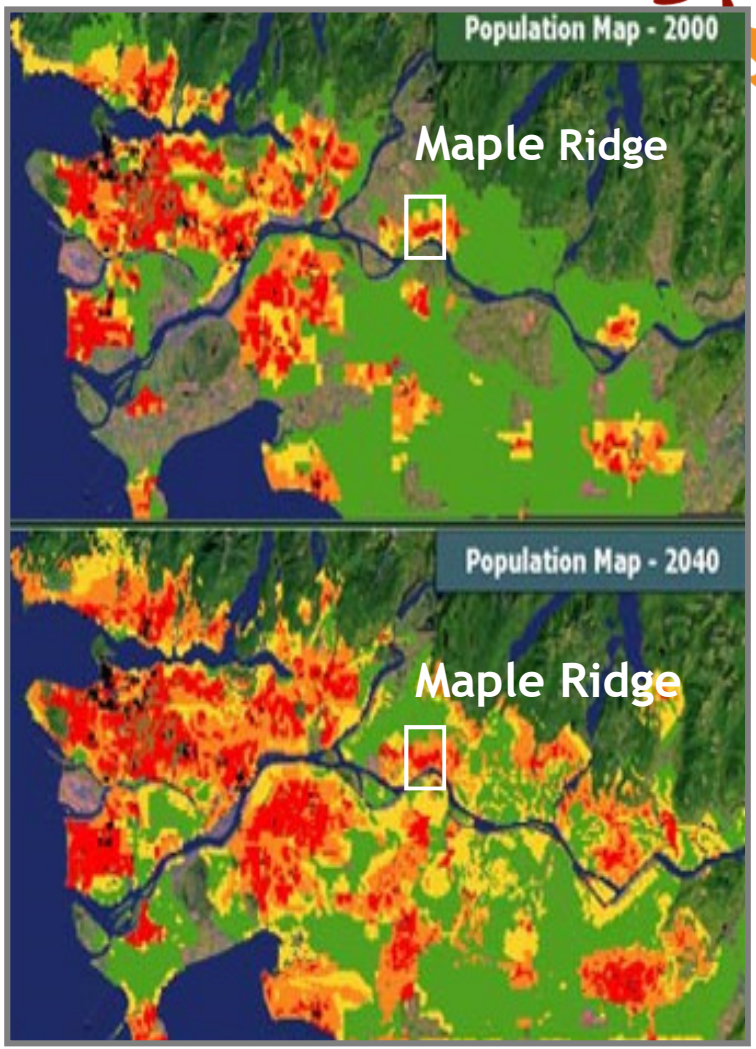
Why Is It Important?

- **Increasing Population** around 78,000 for Maple Ridge in 2016 possibly reaching 132,000 by 2040
- **Complex Geography** with 26,000 hectares of land with diverse array of ecosystems, habitat, species, natural processes, features, and natural assets.
- **Climate Change Impacts** increasing concerns about storm events, flooding, drought, wildfire, sea level change, local food security, peak oil, soil erosion.
- **Increasing Development Pressures** fragmentation of landscape, increasing densification or urban infill areas, and potential negative impacts on health, livability, & costs passed along to citizens



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Timing & Context For Maple Ridge

- Current re-vitalization of Town Centre, Lougheed Area Plan, Hammond Area & other urban infill areas
- Ongoing densification of urban infill areas & increasing loss of green spaces, natural assets and natural features = fewer benefits & ecoservices
- Commitment to Climate Action Change and Resiliency
- News Area Plans and support for ongoing “Smart Growth” & OCP Natural Features principles, objectives and policies
- High Priority strategy as identified in EMS Report 2014
- Significant Cost Savings associated with Green Infrastructure
- Opportunities to Learn From Others?

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What Do We Know About Maple Ridge's Natural Assets?

Land Cover for Maple Ridge (2011) Loss over 5.5% tree canopy over 10 years

Tree Cover	Grass	Building	Impervious
% 52.9	% 32.3	% 6.33	% 8.43

Land Cover for Town Centre (2011) Loss over 10% canopy cover over 10 years

Tree Cover	Grass	Building	Impervious
% 16	% 24.2	% 26.6	% 33.2

- In Maple Ridge we currently have approximately 50% tree cover with 10-15% loss every 10 years. Town centre canopy cover currently at 16% This is less than City of Toronto (20%). Regional performance target for forest cover is around (40%)
- Over 10 years CMR lost 6% of total tree cover in total, and replaced urban forests and trees with impervious area and structures.
- **i TreeEvaluation results**: losses estimated around $9,388,753.53 (9.3 Million) over past decade in services / benefits due to tree removal and clearing.

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Why Is Green Infrastructure Important?

1. Urban Ecological Restoration is a Multi Trillion Dollar Industry and one of the fastest growing economic sectors

2. History of failed & costly urban centres & neighborhoods with insufficient use green spaces and green infrastructure

3. Ongoing ‘City Green’ & green infrastructure mgmt. strategies to support revitalization of cities and more cost effective infrastructure mgmt. strategies & healthy urban environments to live, work & play in.

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Benefits and Services are Well Documented

Multi Beneficial and Cost Effective Services

QUALITY OF LIFE. Greenspaces improve livability, enhance local character, and provide access to nature.

HUMAN HEALTH. Interaction with nature is essential to human health. A large and growing body of research in Canada and abroad clearly demonstrates that physical, social and psychological well-being are positively influenced by our views of and access to nature.

RECREATION. Connected and expanded green networks increase both passive (e.g., walking, bird watching) and active (e.g., jogging, cycling) recreation opportunities.

FOOD PRODUCTION. Green infrastructure supports a diversity of insects, plants, animals and other organisms, many of which are beneficial to local food production. Community and backyard gardens contribute to livability and provide an affordable local food source.

ENVIRONMENTAL EDUCATION. Urban greenspace creates more opportunities for people to experience, engage with, and learn about nature and ecosystem services.

FINANCIAL. Greener environments can attract businesses and employees, and provide jobs in tourism, agriculture, and other sectors. Green infrastructure can also minimize capital requirements and reduce long-term maintenance and replacement costs associated with traditional infrastructure.

STORMWATER MANAGEMENT. Green infrastructure can mimic and replace conventional grey infrastructure such as stormwater pipes and tanks resulting in reduced capital and maintenance costs. Trees and vegetation decrease the amount of hard surfaces and increase rainwater interception and infiltration, reducing the risk of storm sewage overflows and flooding.

ENERGY EFFICIENCY. Trees and vegetation shade and cool buildings in the summer, and help insulate buildings in the winter.

AIR QUALITY. Trees help cool the atmosphere, reducing the production of harmful pollutants. Trees and vegetation also absorb and store carbon dioxide, and release oxygen into the atmosphere.

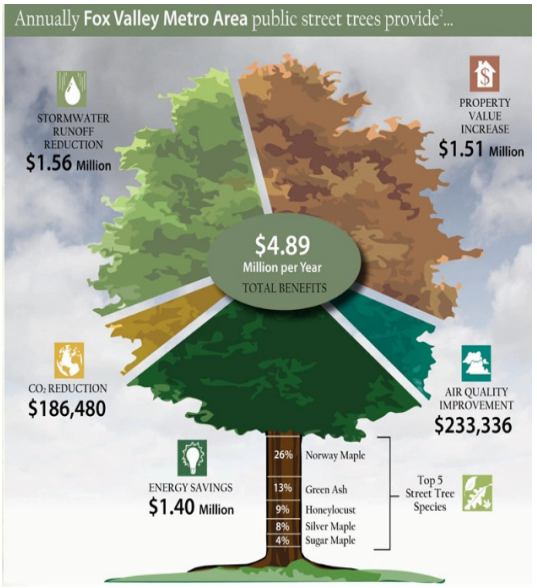
WATER QUALITY. Vegetation and healthy soils clean urban runoff and allow water to be absorbed into the ground, recharging streams and groundwater.

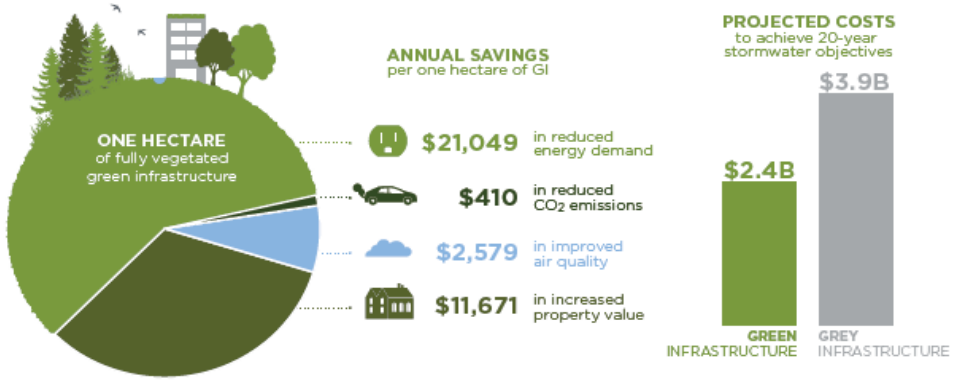
HAZARD REDUCTION. Vegetated landscapes absorb water and stabilize slopes, helping to protect the built environment against hazards like flooding and landslides.

BIODIVERSITY. Restored natural vegetation, streams, lakes, and wetlands provide habitat, including food and shelter for a diversity of species. Natural corridors allow plants and animals to move between larger habitat areas, overcoming the effects of habitat fragmentation and helping to diversify the gene pool.

GREEN CORRIDORS AND THE NECTAR TRAIL PROJECT

The Nectar Trail is a new Vancouver-based community initiative that will connect existing pollinator-friendly habitats in the urban environment by building corridors of native flower gardens between them. This program is organized and maintained by the Environmental Youth Alliance, the City of Vancouver, the Vancouver Park Board and local residents. These greenways will encourage pollinator travel, which in turn supports nature and local food production while offering opportunities for environmental education and improved livability in the surrounding community. The first Nectar Trail project will link Queen Elizabeth Park to the Van Dusen Gardens along the





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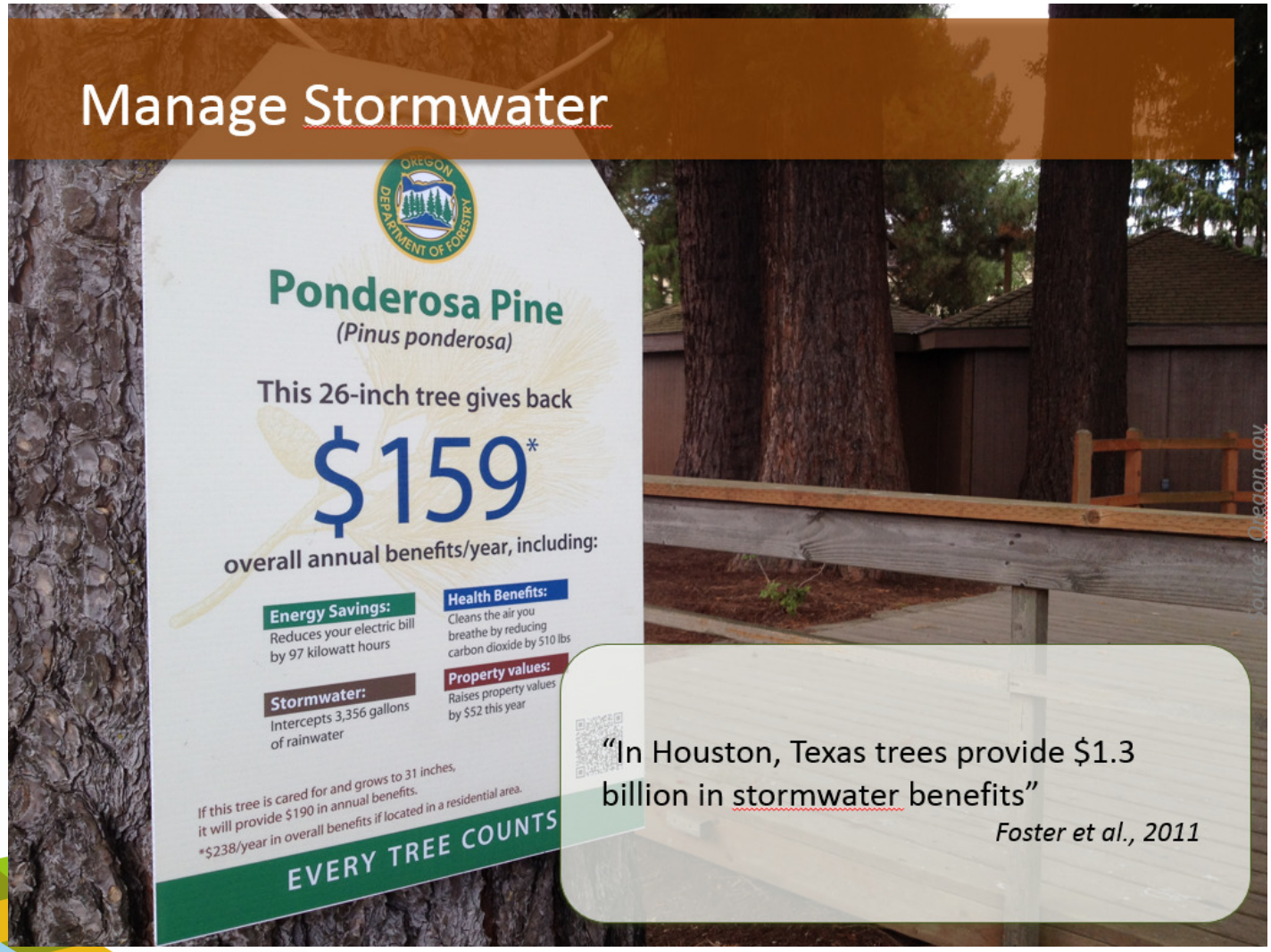
Why Is It Important?

Significant Potential Cost Savings



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Case Studies: Stormwater Mgmt.

Integrated Solutions

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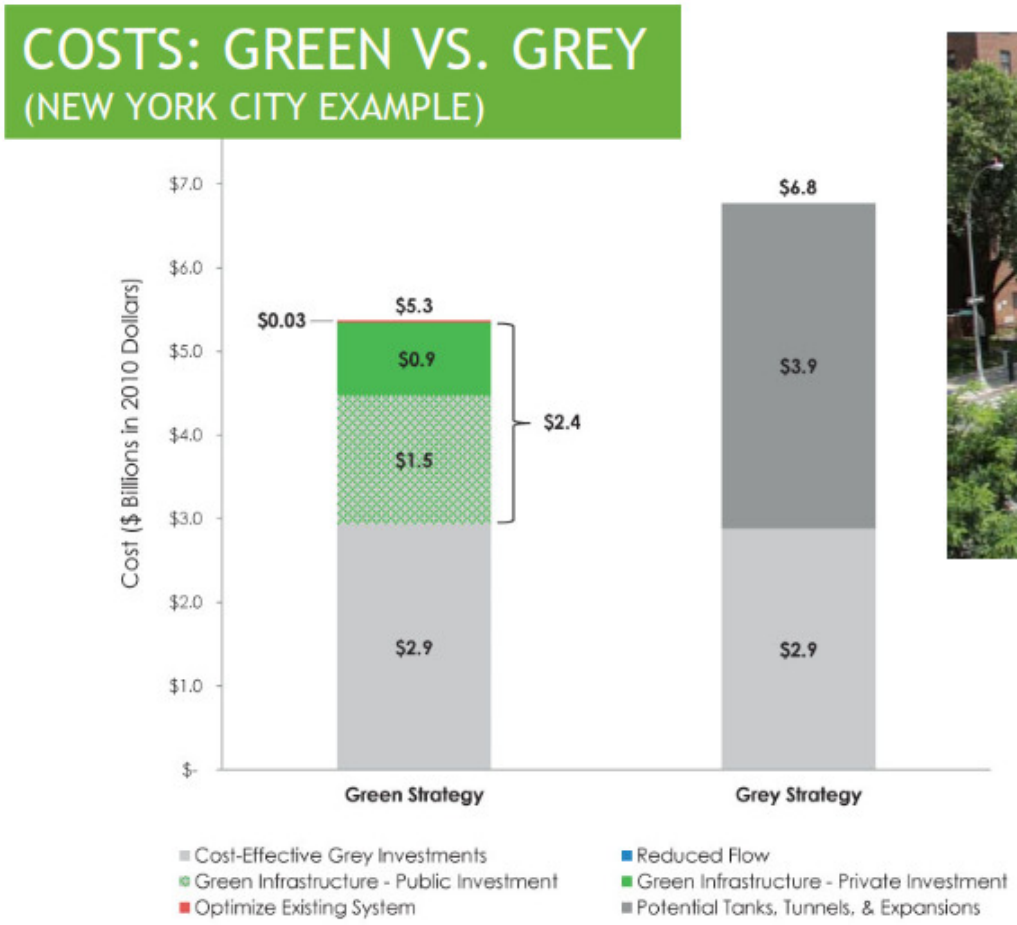
Lessons Learned

Cost Effective Solutions



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Why Is Green Infrastructure Important?

Ecological Resiliency to Climate Change

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Why Is It Important?

Increasing Densities and Paved Surfaces

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Why Is It Important?

Increasing Health and Safety Concerns

Why Is It Important?

Air Quality & Climate Change Impacts

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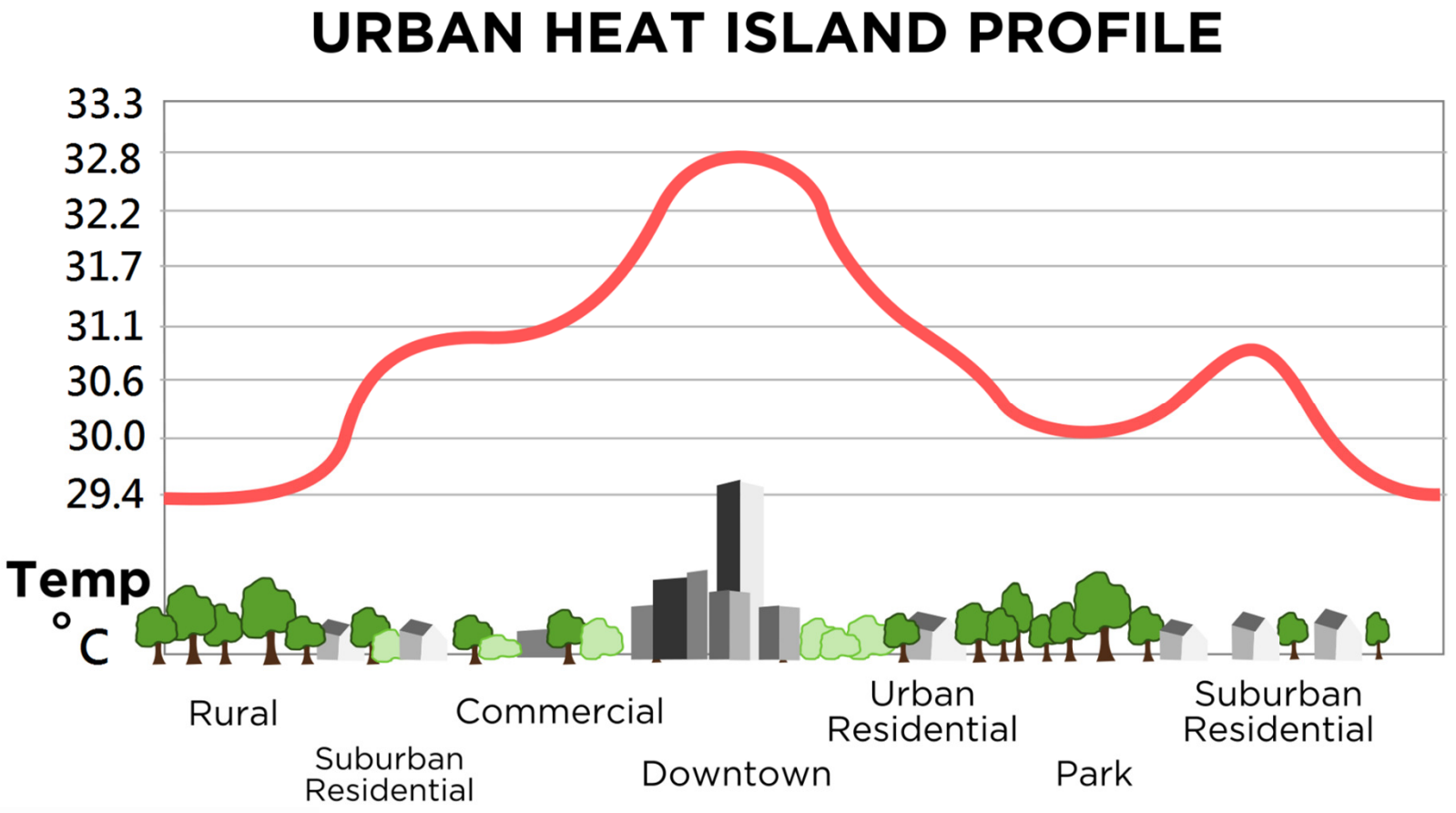
Health: Urban Heat Islands



Source: National Oceanic and Atmospheric Administration

Suburban areas with mature trees are 3-5 ºC cooler than new suburbs or urban centres without trees. *Kreuger et al., 2008*

EAC Priorities and Mandate

A Green Infrastructure Management Strategy For Maple Ridge must support and comply with existing strategic plans…

- Consistent with OCP Objectives, Policies, DP Guidelines, and Area Plans
- Supports Council's Current Strategic Vision & Priorities
- Follows Environmental Management Strategy 2014 recommendations
- Endorsement from the Council which occurred November 2021

The Visioning Process

“Liveable, Resilient, Healthy Community”

“Green Cities” and “Cities in Nature’

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What Is The Strategic Vision For Maple Ridge?

VISION, GOALS & TARGET

VISION

Maple Ridge's natural environment is embraced as a valued resource for our community health and as a natural asset we take pride in

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Sub-Committee Strategic Plan

Phase One. (2019-2020)

Create a Scoping Report for Council's consideration

1. Background analysis and Findings

- Why is Green Infrastructure important?
- What can we learn from others?
- Determine what common and unique strengths, challenges, gaps we are facing in different types of urban areas?
- Work with various departments to determine what green infrastructure resources, challenges, gaps and opportunities we are facing?
- What existing resources, tools, strategies and incentives does the City have or need to implement smart growth and green infrastructure mgmt. designs?

Sub-Committee Strategic Plan

Phase One. (2020-2021)

2. **Internal Assessment –**
   - Corporate and Departmental initiatives, challenges, & opportunities
   - Identify existing resources, tools, and natural assets available
   - Determine gaps with respect to information, tools, resources
   - Support potential opportunities in the short, medium, and long term
3. **Ongoing Education and Awareness**
   - Guest speaker series on possible strategies & design options are important for the community?
   - Ongoing efforts to learn from others i.e. regional and local govs.

3. **Determine Next Steps, Options, and Action Items**

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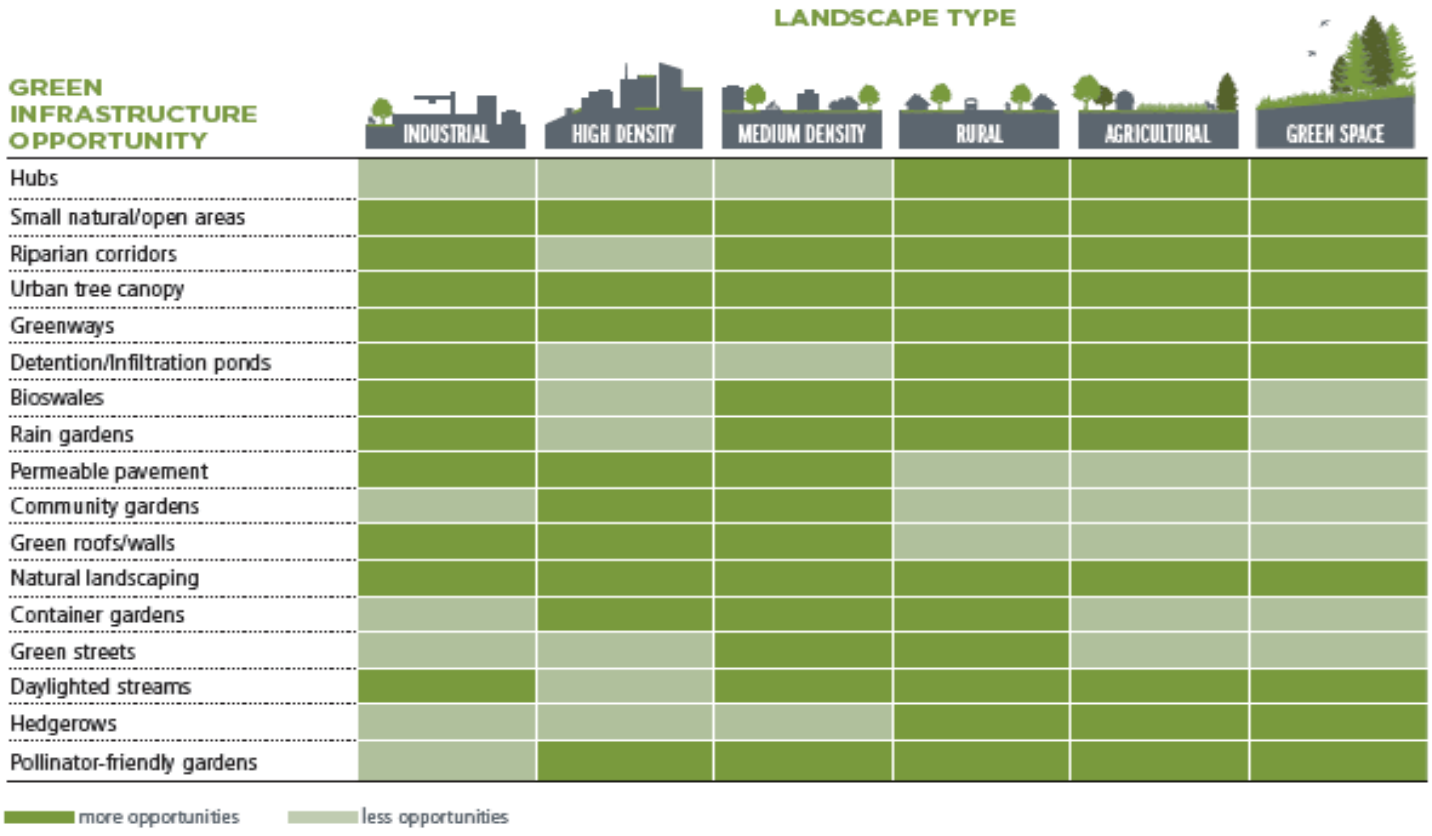
An Adaptive Incremental Approach

- Multi-Faceted Benefits / Solutions
- Learning From Others – Successes and Failures
- Different Zones/Land Uses – Different Designs and BMPs



Green infrastructure opportunities by landscape type

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