

NO: R171

COUNCIL DATE: SEPTEMBER 9, 2013

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## REGULAR COUNCIL

TO: **Mayor & Council** DATE: **September 9, 2013**  
FROM: **General Manager, Planning and Development** FILE: **0450-01**  
SUBJECT: **Comments on the Draft "Metro Vancouver Regional Green Infrastructure Network Strategy" Backgrounder and Map**

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## RECOMMENDATION

The Planning and Development Department recommends that Council:

1. Receive this report as information; and
2. Authorize staff to forward a copy of this report and the related Council resolution to Metro Vancouver as the City of Surrey's comments regarding the document titled "Ecological Health Action Plan Backgrounder: Regional Green Infrastructure Network", which was forwarded in draft form to the City for comments.

## INTENT

The purpose of this report is to:

- Provide an overview of the draft Metro Vancouver "Regional Green Infrastructure Network Strategy ("RGIN Strategy") Backgrounder" document and map, both of which are attached as Appendix I to this report, that the Metro Vancouver Planning Committee has referred to member municipalities for comment; and
- Identify key concerns and opportunities with respect to the draft RGIN Strategy and related mapping from the perspective of the City of Surrey that are proposed to be forwarded to Metro Vancouver for consideration in preparing the final Strategy.

## BACKGROUND

Metro Vancouver has prepared a draft RGIN Strategy Backgrounder and a map titled "Potential Green Infrastructure Network" and is requesting that Surrey provide by September 20, 2013 comments and example Green Infrastructure Network projects for future case study inclusion.

Metro Vancouver is currently advancing its RGIN Strategy as part of the implementation of the 2011 Ecological Health Action Plan. The Ecological Health Action Plan outlines local projects and initiatives focused on protecting and restoring habitat and green space and enhancing the connection between people and nature in the Region.

## **DISCUSSION**

This report provides comments of the draft RGIN Strategy and backgrounder document, and identifies areas of inconsistency between Surrey's Green Infrastructure Network (GIN) plans and the draft MV Strategy and recommends possible approaches to address these inconsistencies. It also discusses sample green infrastructure-related projects in Surrey for consideration as case studies.

### **Overall Response**

The RGIN Strategy is a tool to encourage the cooperation and sharing of information between member municipalities in achieving both local and regional goals with respect to ecological health and to assist in developing a regional network of green infrastructure network projects.

A review of the legal, legislative, and financial constraints and opportunities available to local government for creation and enhancement of Green Infrastructure would serve municipalities in the implementation of the local GIN plans. The high level mapping of biodiversity and regionally-owned assets is complementary to the work that has already been undertaken by Surrey as part of the Surrey Ecosystem Management Study ("EMS") that was completed in 2011 (see Appendix II), and during the development of the Biodiversity Conservation Strategy ("BCS"), which is currently being completed.

City staff has consulted with Metro Vancouver staff throughout Surrey's Green Infrastructure Planning processes and as such, the RGIN Strategy developed by Metro Vancouver illustrates major Hubs, Minor Hubs, and Regional Corridors at locations that are generally consistent with Surrey's plans with only minor inconsistencies discussed later in this report.

### **Surrey Green Infrastructure Network Plans**

Surrey completed in 2011 a City wide GIN plan (Appendix II) as part of the Surrey EMS. The EMS updated and enhanced the City's environmental mapping and provided a framework for a GIN for all of Surrey, which complements and enhances the regional plans for the City. The EMS builds on Surrey's strategic place in the Region and provides management guidelines for environmentally significant lands and ecosystem values that are identified in a network of Hubs sites and connecting corridors throughout the City.

The Surrey BCS is currently being completed. The BCS builds on the EMS, and provides a strategic framework that includes biodiversity goals and targets and conservation priorities for the City of Surrey and prioritizes the Green Infrastructure Network areas and connections as contained in the EMS.

A draft of the Surrey BCS Regional Wildlife Corridors map is attached to this report as Appendix III. The detailed GIN map for the City of Surrey is attached to this report as Appendix IV. Copies of completed Surrey BCS will be forwarded to Metro Vancouver after it is approved by Council, which is expected in the fall of 2013.

### **Comments on Metro Vancouver RGIN Strategy Mapping**

In general, staff supports Metro Vancouver's RGIN non-parcel-based mapping approach, as well as the high level policy objectives and general guidelines that are contained in the draft RGIN

Strategy. These objectives and guidelines provide a flexible framework for cooperative RGIN planning and implementation across the Region.

The following table summarizes areas where there are inconsistencies between the MV Strategy RGIN maps and Surrey's GIN maps and in each case provides a recommendation in relation to rectifying the inconsistency. In general, it is proposed that the MV RGIN mapping be modified to be consistent with the Surrey's Regional Wildlife Corridors and GIN maps as contained in the draft Surrey BCS mapping. The recommended modifications are highlighted in Appendix V to this report.

Metro Vancouver RGIN Area	Comment on the RGIN	Recommended Amendments to RGIN
1. Regional Corridors	Three (3) 'Potential Regional Corridors' not illustrated as "Regional" in the draft Surrey BCS Wildlife Corridors Map (Appendix III) should be removed.	<ul style="list-style-type: none"> <li>o Remove a Corridor in North Newton parallel to 96 Ave;</li> <li>o Remove a Corridor through Cloverdale Town Centre between 64 Ave and 56 Ave; and</li> <li>o Remove a Corridor between Green Timbers and Tynehead Park.</li> </ul>
	Four (4) Corridors illustrated as "Regional" in the draft Surrey BCS Wildlife Corridors Map (Appendix III) and the Surrey BCS GIN map (Appendix IV) should be added.	<ul style="list-style-type: none"> <li>o Add a Corridor along western ridge of Campbell Heights Area;</li> <li>o Add a Corridor along the Serpentine River through Tynehead Park toward Surrey Bend;</li> <li>o Add a Corridor west of 176 Street within North Clayton toward Langley Township parallel to 88 Ave; and</li> <li>o Add a Corridor between Green Timbers and Invergarry Park continuing north toward the Fraser River.</li> </ul>
2. Major Hubs	No changes recommended (Appendix IV):	o N/A
3. Minor Hubs	Three minor Surrey Hubs should be added based on the draft Surrey BCS GIN map (Appendix IV).	<ul style="list-style-type: none"> <li>o Add Redwood Park as a Minor Hub;</li> <li>o Add Fergus Creek Park as a Minor Hub; and</li> <li>o Add Mound Farm Park as a Minor Hub.</li> </ul>

### Samples of Surrey Green Infrastructure Projects for Case Studies

The Metro Vancouver Backgrounder document provides an opportunity for member municipalities to showcase local Green Infrastructure projects.

An abstract for each of a few City of Surrey Green Infrastructure projects is provided in Appendix VI attached to this report for possible inclusion in the RGIN Backgrounder document. These projects highlight innovative rainwater management strategies and enhancements to biodiversity in Surrey. The projects include:

- Fergus Creek Watershed Park (Highway 99 Corridor Plan);
- Robson Park Revitalization;
- Eugene Creek Diversion and Steam Enhancement; and
- East Clayton Neighborhood Low Impact Design and Green Infrastructure.

## SUSTAINABILITY CONSIDERATIONS

Plans and strategies to maintain and enhance ecological health and biodiversity support the vision of the City's Sustainability Charter; more particularly, the goals of the Environmental Pillar. The MV RGIN Strategy working in conjunction with the Surrey EMS and BCS will assist in accomplishing the following scope action items of the City's Sustainability Charter:

- EN12: Enhancement and Protection of Natural Areas, Fish Habitat and Wildlife Habitat; and
- EN14: Public Education and Sharing of Information.

## CONCLUSION

Based on the above discussion, it is recommended that Council authorize staff to forward a copy of this report and the related Council resolution to Metro Vancouver as the City of Surrey's comments regarding the document titled "Ecological Health Action Plan Backgrounder: Regional Green Infrastructure Network", which was forwarded in draft form to the City for comments.

Jean Lamontagne  
General Manager,  
Planning and Development

MK:saw

### Attachments:

Appendix I	Draft "Metro Vancouver RGIN Ecological Health Backgrounder and Map"
Appendix II	Surrey EMS Green Infrastructure Network Opportunities Map, 2011.
Appendix III	Draft Surrey BCS Regional Green Infrastructure Network Map
Appendix IV	Draft Surrey BCS Green Infrastructure Network Map
Appendix V	Recommended RGIN City of Surrey Addition/Subtractions
Appendix VI	Abstracts of City of Surrey Green Infrastructure Projects



To: Regional Planning Advisory Committee

From: Erin Embley, Regional Planner,  
Planning, Policy and Environment Department

Date: July 5, 2013

Meeting Date: July 19, 2013

Subject: **Regional Green Infrastructure Network Backgrounder**

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**RECOMMENDATION**

That the Regional Planning Advisory Committee provide comments on the draft Regional Green Infrastructure Network Backgrounder.

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**PURPOSE**

Development of a Regional Green Infrastructure Network is a 2013 Budget milestone and is in 2013 Metro Vancouver Action Plan as a key action to promote ecological health. The purpose of the Regional Green Infrastructure Network (RGIN) is to coordinate and build on the region's network of open spaces, corridors and natural resources that provide ecosystem services and protect biodiversity.

**BACKGROUND**

The Metro Vancouver Ecological Health Action Plan, adopted in October 2011, contains 12 actionable projects for implementation in the short term. Project 1 is Advancing a Regional Green Infrastructure Network (RGIN). This report provides the Regional Planning Advisory Committee a draft Backgrounder on the RGIN and an outline of next steps in the development of an RGIN strategy.

**DISCUSSION**

The draft Regional Green Infrastructure Network Backgrounder has been developed to provide greater clarity to the RGIN project and expand on the outline provided in the 2011 Ecological Health Action Plan. The backgrounder explains what green infrastructure is, regional challenges and green infrastructure solutions, green infrastructure benefits and implementation challenges, and a strategy for delivering the RGIN.

Metro Vancouver staff is currently developing the RGIN Strategy. This comprehensive document will help guide development of the network and provide options and recommendations for Metro Vancouver and other government agencies. The strategy will contain best practices, exemplary cases, and implementation guidance for a variety of green infrastructure projects (e.g. from implementing green streets to the protection of conservation areas). It will contain recommendations for eight types of land use corridor varying from conservation to rural residential to high density urban (as identified in the draft RGIN Backgrounder), policy and bylaw options and local case studies.

**ALTERNATIVES**

1. That the Regional Planning Advisory Committee provide comments on the draft Regional Green Infrastructure Network Backgrounder.
2. That the Regional Planning Advisory Committee receive for information the draft Regional Green Infrastructure Network Backgrounder.

**FINANCIAL IMPLICATIONS**

The 2013 Budget allocated \$50,000 to developing the Regional Green Infrastructure Network. These funds will support the development of the RGIN Strategy including regional design and policy recommendations.

**SUMMARY / CONCLUSION**

A Regional Green Infrastructure Network is a key project in the 2011 Ecological Health Action Plan and the 2013 Metro Vancouver Action Plan, and is a 2013 Budget milestone. Metro Vancouver staff has developed a draft Regional Green Infrastructure Backgrounder and associated map. Metro Vancouver staff is requesting that the Committee provide comments on the draft backgrounder by August 16, 2013. Please forward comments to Erin Embley at [Erin.Embley@metrovancover.org](mailto:Erin.Embley@metrovancover.org). Based on comments received and the consultant's reports, staff intends to return to the Committee with a draft RGIN Strategy in the fall and convey the final backgrounder to the Regional Planning and Agriculture Committee and Board.

**Attachment:**

Draft Regional Green Infrastructure Network Backgrounder (Doc. #7590560)

# DRAFT

Metro Vancouver committed to Advancing a Regional Green Infrastructure Network (RGIN) in the 2011 Ecological Health Action Plan. The Ecological Health Action Plan outlines projects to protect and restore habitat and green space and enhance the connection between people and nature. This backgrounder explains:

1. green infrastructure;
2. regional challenges and green infrastructure solutions;
3. green infrastructure benefits and implementation challenges; and
4. a strategy for delivering the RGIN.

### Green Infrastructure

Green Infrastructure is the natural and semi-natural spaces and features in and around cities. Natural areas such as terrestrial, freshwater and marine areas, parks, forests, hedgerows, and wetlands provide ecosystem services. So can constructed features, like gardens, green roofs and recreational trails. When Green Infrastructure is spatially connected it becomes a Green Infrastructure Network.

A RGIN Strategy will bring together the spatial layout of a green infrastructure network, best practices for corridor development, a legal framework and proposed policy guidance.

# Ecological Health Action Plan **Backgrounder** REGIONAL GREEN INFRASTRUCTURE NETWORK

### *Ecosystem Services*

*“Healthy, intact, urban ecosystems purify our air, regulate micro-climate, maintain river flows and groundwater levels, treat our waste, and mitigate natural hazards, in addition to providing cultural and recreational activities.”*

David Suzuki Foundation's  
Natural Capital report, 2010

### Regional Challenges and Solutions

Metro Vancouver is surrounded almost entirely by scenic natural areas. However, population growth has prompted expanding settlement patterns and rapid development of ‘grey’ infrastructure, such as pipes, culverts, and impermeable surfaces. This has created many challenges for the region.

These challenges include sustainably managing waste streams, such as stormwater and liquid waste, and a loss of biodiversity (e.g. pollinators) that can negatively impact our land and food systems. Additionally, the region is not immune to the global challenge of climate change which is projected to cause more frequent and severe storms and natural hazards.

### **Stormwater**

Metro Vancouver owes its lush landscape to complex geography, moderate temperatures and rain. A 14% increase in annual precipitation and an increase in monthly maximum temperature of 1.4°C to 2.8°C by 2050 are projected for the region. Aging stormwater infrastructure and expanding impervious surfaces, combined with climate changes indicate a growing problem for the region.

### **Biodiversity and Habitat**

Metro Vancouver is located in a Provincial ‘Biodiversity Hot Spot’, with 148 terrestrial species listed as *at risk* or *vulnerable*. The list of species impacted by habitat loss and fragmentation continues to grow, and the implications, such as diminished natural pollinator populations, are cause for great concern.

A green infrastructure network is responsive to anticipated increases in temperature and precipitation. Increased and more intense rainfall can best be dealt with by capturing, filtering and detaining precipitation on-site through careful engineering and landscaping (green infrastructure).

As an example, ‘green’ rainwater management may include rain gardens, an affordable solution to keep water on-site, while restoring biodiversity and providing the added benefit of



creating a desirable public space. Solutions like this can be scaled up and strategically implemented through a RGIN.

### **Taking Stock of our Assets**

To better understand the quality and quantity of regional ecosystems, Metro Vancouver recently conducted a Sensitive Ecosystem Inventory (SEI) (Figure 1, below). The inventory provides a detailed snapshot of the region's sensitive ecosystems, those that are healthy, intact, and regionally significant at 0.5 hectares (1.2 acres) in size or larger.

The SEI shows that more than half of the region supports these sensitive ecosystems. Of those, 73% are high quality ecosystems. A large portion of the region's healthy landscapes are the watersheds and forested mountains at

the north and east edges of the region. However, the challenge lies below the watersheds in the more urbanized lower elevations, where just 35% of the area supports sensitive ecosystems and just 40% of those are high quality.

Metro Vancouver also maintains land cover data reflecting what is on the ground throughout the entire region, including built elements and infrastructure, as well as vegetation in any state, bare soil and water.

The Land Cover Classification (LCC) (Figure 2, below) complements the Sensitive Ecosystem Inventory by categorizing land cover for the whole region, not just natural areas that meet the SEI criteria. This data helps identify opportunities to connect Sensitive Ecosystems and advance a RGIN.

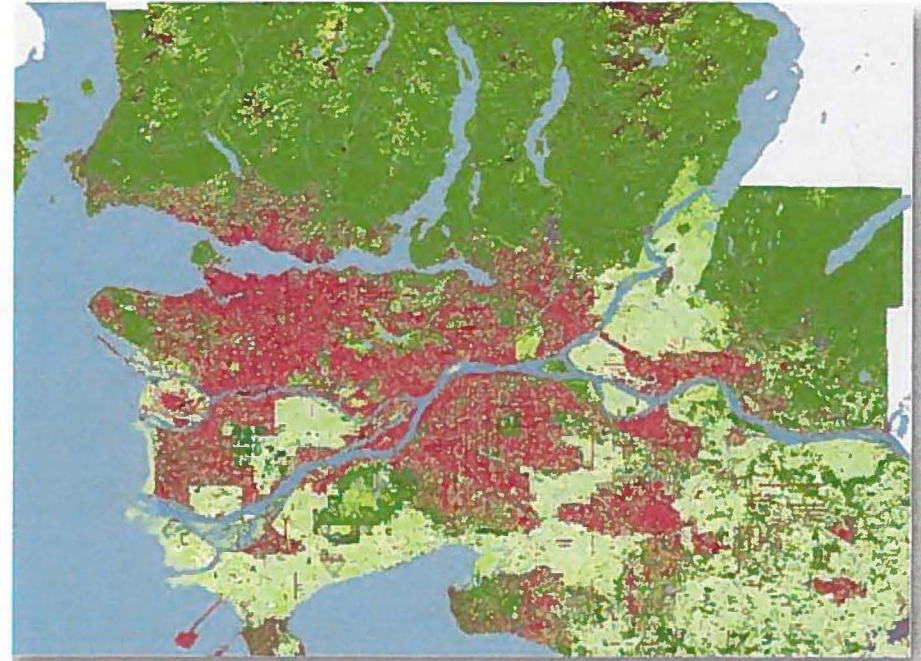
### **Opportunities to Improve**

*A large portion of Metro Vancouver's healthy landscapes are located in the forested mountains at the northern and eastern edges of the region. The more urbanized areas of region have fewer natural landscapes, and many are of lower quality. However, there are valuable pockets of opportunity throughout the urban fabric to improve and expand on green infrastructure.*

Figure 1: Sensitive Ecosystem Inventory map



Figure 2: Land Cover Classification map





## Regional Green Infrastructure Benefits

A collaborative approach to solving regional problems will ensure each locality is working strategically toward shared objectives. A RGIN is an integrated solution to challenges facing the region. The many benefits include:

<b>Soils &amp; water quality</b>	Vegetation and healthy soils allow water to be absorbed into the ground, recharging streams and groundwater, cleaning urban runoff, and potentially preventing storm sewage overflows.
<b>Biodiversity</b>	Restored natural vegetation, streams, lakes, and wetlands provide more habitat, including food and shelter for all species.
<b>Environmental education</b>	Nature and green space within the urban fabric create greater opportunities for people to engage and learn about nature.
<b>Wildlife movement</b>	Corridors allow plants and small animals to move between larger habitat areas, overcoming the effects of habitat fragmentation.
<b>Hazard reduction</b>	Vegetated landscapes can protect the built environment against hazards like flooding, landslides, and earthquake liquefaction by absorbing water and stabilizing slopes.

**Recreation** More green networks could increase the number of greenways suitable for walking, jogging, and cycling.

**Quality of life** Vegetation improves the built environment and can reduce energy use. Green spaces improve livability and enhance local character.

**Economic development** In addition to saving money on conventional infrastructure, green infrastructure supports economic revitalization by creating a desirable place to live and work.

As described above, intact natural ecosystems are green infrastructure; they store and purify water, moderate climate, protect against extreme weather events and natural hazards, and support biodiversity.

Grey infrastructure is typically built in urban areas to mimic the functions of natural ecosystems, and small fragments of managed vegetation are used to protect diminishing biodiversity. Urban environments that protect and develop green infrastructure can rely less on traditional grey infrastructure to handle waste and extreme weather events.

Green infrastructure development should be strategically prioritized, and corridors and natural elements in and around the urban fabric must be protected. A RGIN will improve ecosystem health and resilience, contribute to biodiversity conservation and enhance ecosystem services across the region.

### *Green Infrastructure: An Emerging Tool for Regions Worldwide*

*Many major metropolitan areas have recognized the importance of protecting natural areas and developing green infrastructure.*

*In the US, San Francisco, New York and Philadelphia are currently investing billions of dollars in green infrastructure solutions. Philadelphia is investing \$2.5 billion dollars to develop 9,000 acres of green infrastructure focused on stormwater solutions over the next 25 years.*

*The US Environmental Protection Agency provides technical assistance to cities across the country for Green Infrastructure projects including code review to remove policy barriers, green infrastructure design, and cost-benefit assessments.*

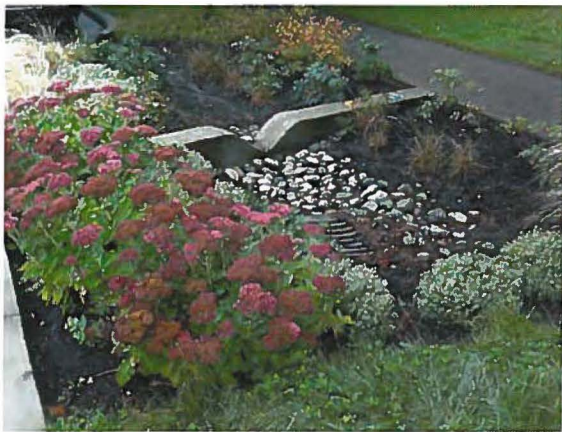


## Implementation Challenges

Implementing landscape based solutions in a growing region with conflicting priorities is challenging. The issues include:

- poor collective understanding of the value of ecosystem services;
- many players with fragmented environmental protection policies;
- lack of integration of water, environment and land use policy between municipal, regional, provincial and federal agencies;
- lack of buy-in by citizens and industry on alternative approaches to infrastructure and the value of ecosystem services;
- the need to achieve inter-jurisdictional support; and
- lack of a clear vision for environmental protection.

Developing a strategic regional approach to implementing green infrastructure solutions can create new opportunities while supporting existing efforts, provide benefits of scale and create opportunities for collaboration and cooperation.



## RGIN Strategy

The RGIN Strategy will bring together the spatial layout of the network, guidance for improving corridors, and a proposed policy direction for implementation.

Metro Vancouver has established the following objectives for the strategy.

### **Objectives (Process)**

1. Provide a regional focus and use regional ecological data (SEI) in a pragmatic and strategic way.
2. Provide specific implementation strategies and policy recommendations linked to the network.
3. Support collaboration between local, regional and provincial initiatives on the ground.

### **Objectives (Outcome)**

1. Provide educational tools, policy and legal support to help capture rainwater on-site.
2. Conserve and enhance regional biodiversity through on the ground projects.
3. Map and prioritize regionally significant corridors to tie together green spaces.

### **Metro Vancouver Actions**

- Working together with partners to develop a robust RGIN Strategy
- Develop an online tool to help aggregate landscape information and guidance for green infrastructure projects.
- Integrate green infrastructure designs focused on groundwater recharge and habitat augmentation into new developments and landscaping.
- Undertake and/or support riparian and estuary restoration projects.

## **RGIN Draft Map**

Regionally significant ecosystems (hubs) and connections between them (corridors) have been identified using Metro Vancouver's Sensitive Ecosystem Inventory and Land Cover Classification. Existing and potential corridors and hubs have been mapped at a regional scale to create a draft network (Figure 3, p.2). The network includes well established, functioning ecosystems, and natural areas that align with existing or planned municipally protected areas and networks. This mapping will be refined with expanded input from regional partners.

The draft network, shown on the following page, includes ecologically sensitive hubs, and existing or high potential corridors. There are 63 possible hubs including 23 large and 40 smaller hubs. There are currently 13 corridors within the draft network including five major and one minor east-west linkage, and five major and two minor north-south linkages. The draft RGIN also captures most of Metro Vancouver's sensitive ecosystem classes.

The draft RGIN identifies:

- 15 different classes and 30 different sub-classes of sensitive and other important ecosystems.
- Protected areas, including federal, provincial, local and non-governmental.
- Land from a variety of jurisdictions and supporting varied land uses.

# DRAFT: Potential Regional Green Infrastructure Network

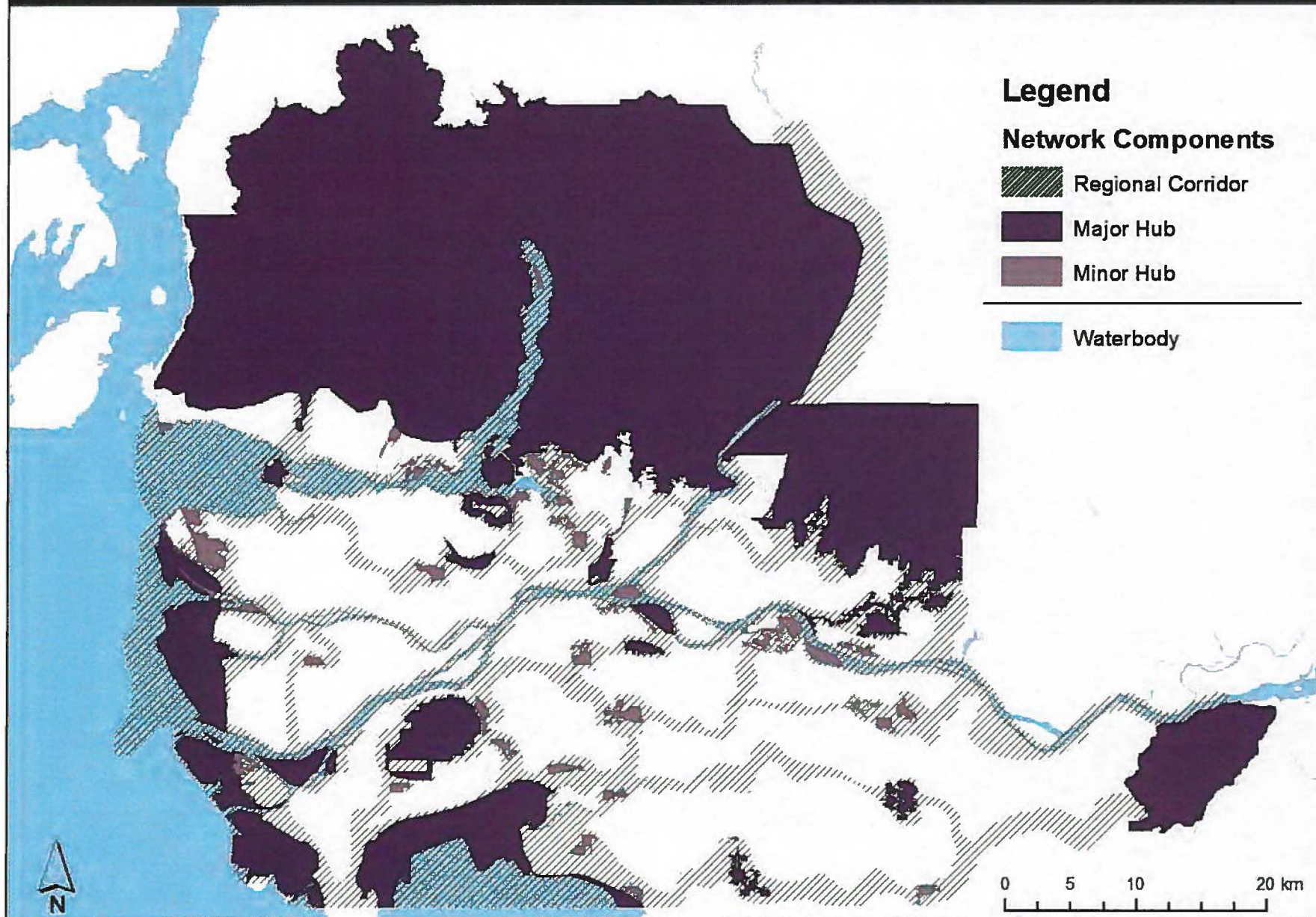


Figure 3: Draft Potential RGIN

**A Flexible Approach**

The approach to corridor development will vary greatly depending on location, existing conditions, and management. Eight corridor typologies have been identified (Figure 4, p.2):

1. High Density Urban
2. Low Density Urban
3. Industrial/Working lands

4. Rural Residential
5. Active Agriculture
6. Non-Active Agriculture
7. Recreation
8. Conservation

Each typology has unique characteristics and opportunities for establishing the green network.

The RGIN touches each land use designation of the Regional Growth Strategy and many more Official Community Plan designations. The scale, design and tools proposed to support implementation of the RGIN will be responsive to the opportunities and constraints associated with adjacent land uses.

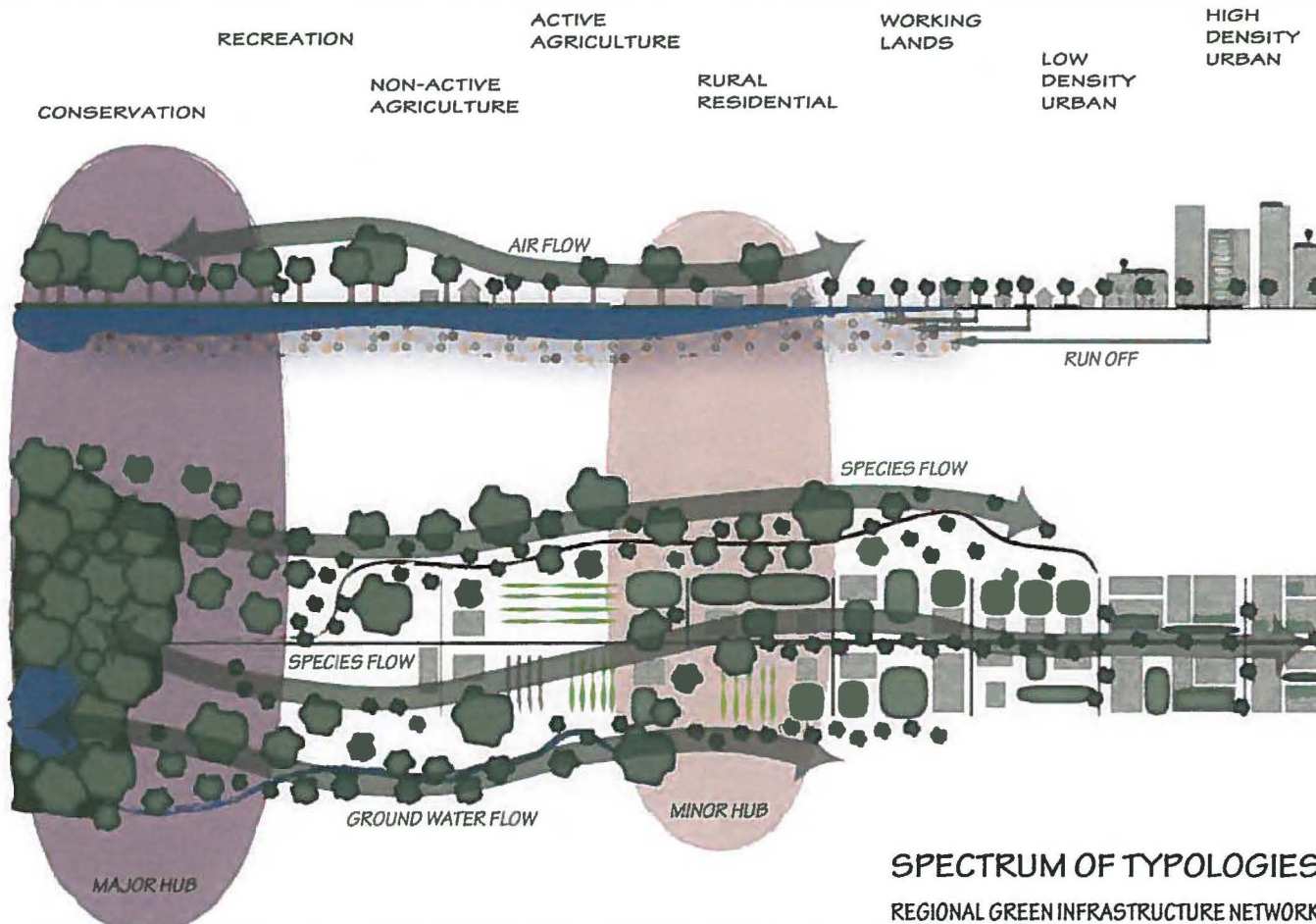


Figure 4: RGIN Corridor Typology Concept

## Conclusion

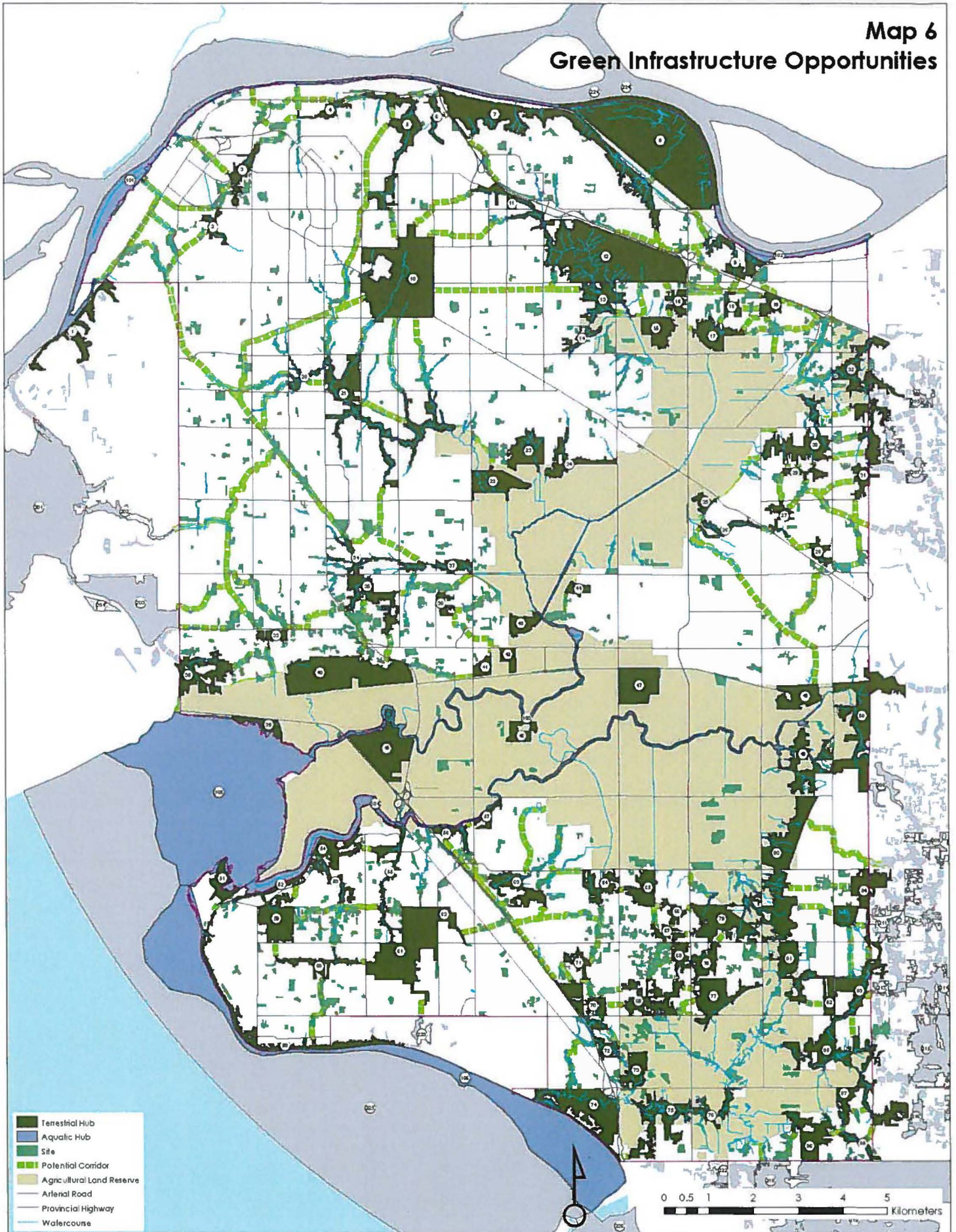
All levels of government, agencies, organizations, corporations and dedicated individuals protect natural areas. Diverse natural areas, large and small, are the building blocks of a Regional Green Infrastructure Network. With increasing urban development pressures, now is the time to move forward collectively with a strategy to connect the dots.

This backgrounder is the next step to formalizing the development and protection of the Regional Green Infrastructure Network. As we move forward, we will develop a RGIN Strategy to assist in providing legal and policy directions to the spatial layout of the network. We have the opportunity as we begin on this journey to create a world-class resource, which will increase ecosystem services, economic prosperity, livability, manage risk, provide recreational opportunities and improve ecological health for Metro Vancouver citizens.



# APPENDIX II

## Map 6 Green Infrastructure Opportunities



**DRAFT**

**NOT APPROVED**



**Biodiversity Strategy**  
**REGIONAL WILDLIFE**  
**MOVEMENT CORRIDORS**

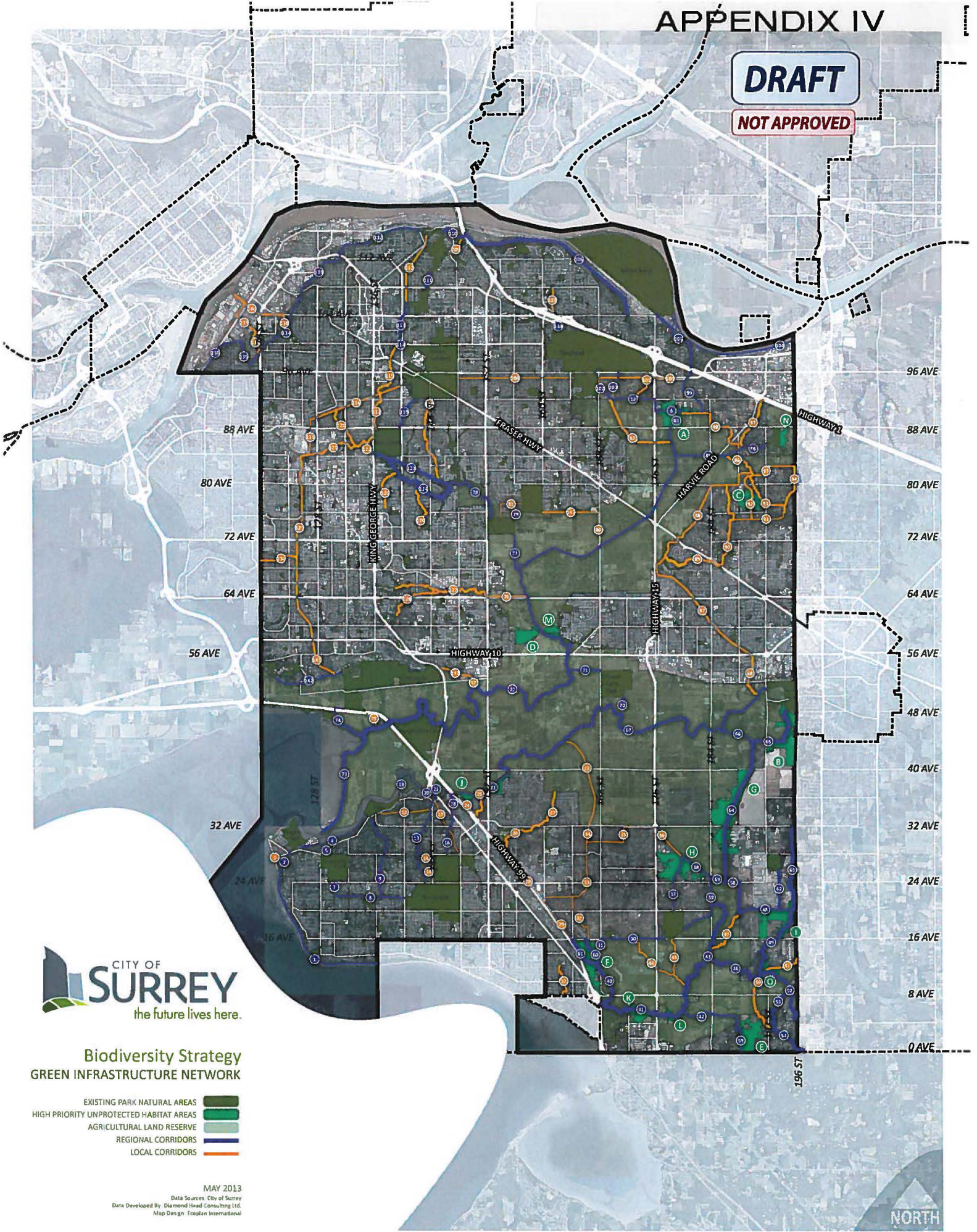
- PARKS 
- PRIMARY CORRIDORS 

MAY 2013  
 Data Sources: City of Surrey  
 Data Developed By: Diamond Head Consulting Ltd.  
 Map Design: Ecaplan International

NORTH

**DRAFT**

**NOT APPROVED**



**Biodiversity Strategy  
GREEN INFRASTRUCTURE NETWORK**

- EXISTING PARK NATURAL AREAS
- HIGH PRIORITY UNPROTECTED HABITAT AREAS
- AGRICULTURAL LAND RESERVE
- REGIONAL CORRIDORS
- LOCAL CORRIDORS

MAY 2013  
 Data Sources: City of Surrey  
 Data Developed By: Diamond Head Consulting Ltd.  
 Map Design: Ecoplan International

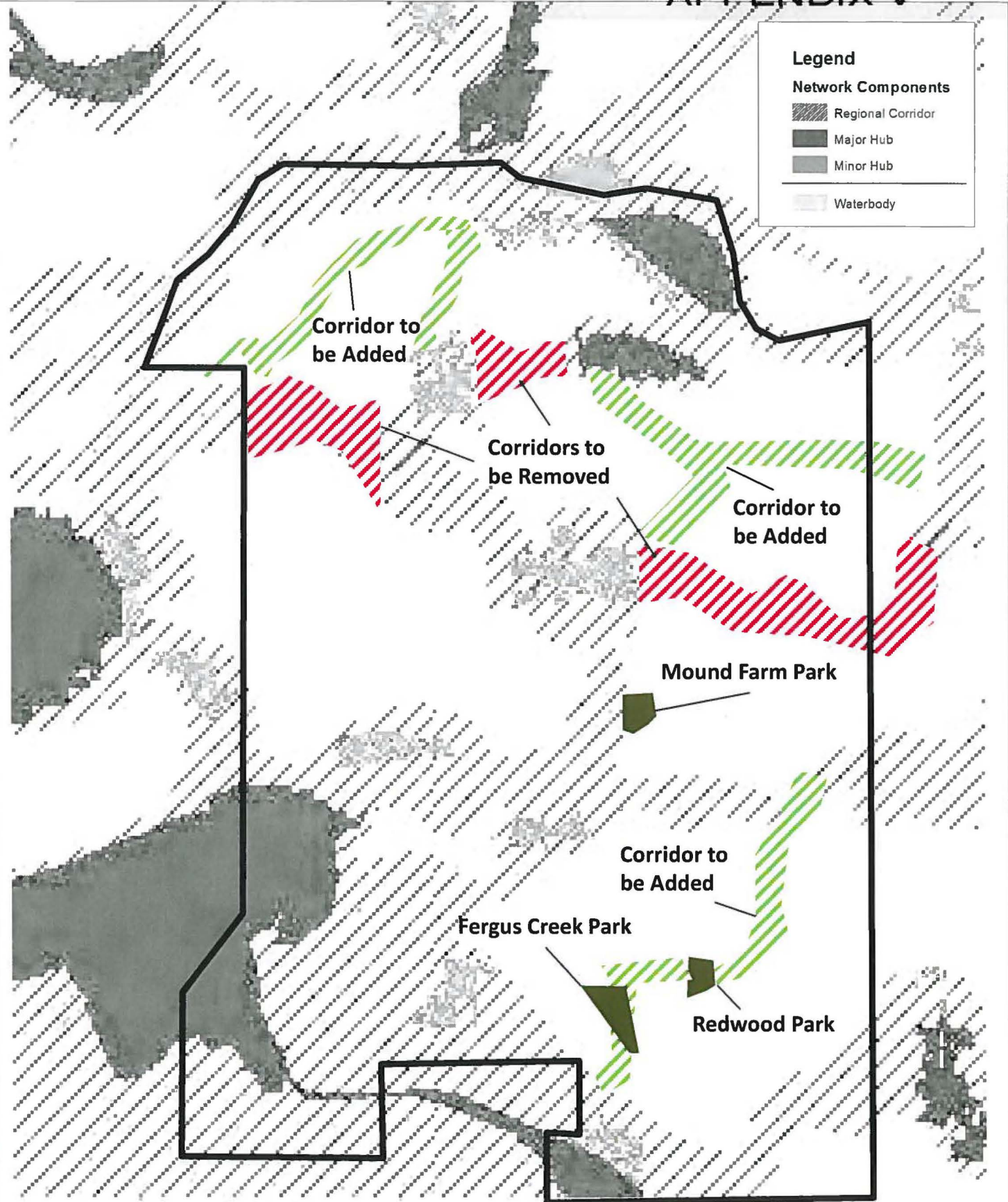
NORTH



**Legend**

**Network Components**

- Regional Corridor
- Major Hub
- Minor Hub
- Waterbody







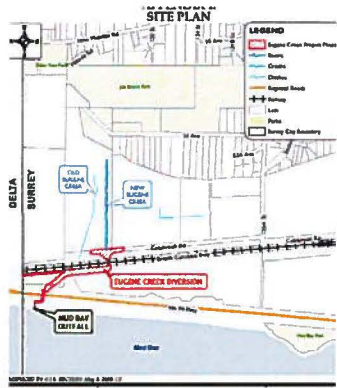
**Legend**

**Regional Green Infrastructure Network Additions/Subtractions**

- Subtractions from Metro Vancouver RGIN Corridors
- Additions to Metro Vancouver RGIN Corridors
- Additions to Metro Vancouver RGIN Minor Hubs

**SAMPLE CITY OF SURREY GREEN INFRASTRUCTURE PROJECTS**

Project Name	Location	Description	Sample Plan(s)/Photo(s)
<p><a href="#">Fergus Creek Watershed Park</a> (Hwy 99 Corridor Land Use Plan)</p>	<p>1277 168 Street, Surrey BC</p>	<p>Fergus Creek Watershed Park is a 26.3 hectare (67 acre) park located in South Surrey. The City acquired the park in 2009 to protect the Fergus Creek headwaters and to provide opportunities for residents to enjoy the natural areas. This park was acquired by the City primarily for habitat protection, as per the Hwy 99 Corridor Land Use Plan which is one example where Surrey has innovated DCCs.</p> <p>In this corridor's concept plan, Surrey obtained a large piece of passive park land "Fergus Creek Park": that now serves multiple purposes within the watershed. The greenway/hub acts as a passive park, preserving the ecosystem within its boundaries, and it is being designed to serve a storm water management purpose as well. Developers within the Hwy 99 Corridor Plan who benefit from this service amenity are required to pay DCCs to facilitate Surrey's cost recovery respecting preservation of that piece of land.</p> <p>The City is currently preparing a master plan for Fergus Watershed Park to protect and enhance the ecological features and functions of the park while incorporating greenway corridors that will serve multiple functions - providing recreational trails, drainage, rain water management, natural forest landscaping, and important habitat and riparian protection, while also integrating sensitive recreational, cultural and educational opportunities.</p>	
<p><a href="#">Robson Park Revitalization</a></p>	<p>12499 100 Avenue, Surrey BC</p>	<p>Robson Ravine Park protects over 3.6 hectares (8.9 acres) of uniquely sensitive ecosystem. The largest portions of the Park date back to 1956, when the upper ravine was protected through neighbourhood subdivision. Decades later, portions of the lower ravine were added through additional land dedication and purchase.</p> <p>The park revitalization project included several enhancements to recreation amenities, improved public safety, upgraded environmental features, and drainage improvements to improve water quality and protect downstream habitat including stream day lighting and Salmon Habitat Restoration Program (SHaRP) in restoring ponds and streamside locations. The project successfully merged the need for storm water management in an older neighborhood with the need to revitalize a dated park facility.</p> <p>Robson Park is a great example of Surrey's commitment to sustainability and infrastructure investments through our Build Surrey program. The community continues to be involved as the project continues, with participation by local organizations in planting, education initiatives and maintenance to help ensure the newly constructed facilities will be respected and cared for in the community.</p>	

Project Name	Location	Description	Sample Plan(s)/Photo(s)
<p>Eugene Creek Diversion &amp; Stream Enhancement</p>	<p>Highway 10 and east of 120 Street in the Panorama Ridge area of the City of Surrey.</p>	<p>The Eugene Creek Diversion re-directs the upland watershed from Panorama Ridge to the historic lowland portion of the creek system. This lowland Eugene Creek channel experienced minimal flows prior to the Diversion and the outfall was affected by sedimentation. The Diversion consists of 980m of new channel and dykes and an improved outfall into Mud Bay.</p> <p>The new channel and upgraded outfall provide improved fish passage and in-stream habitat features which are expected to significantly enhance juvenile Coho salmon and Cutthroat trout populations present upstream of the Diversion. The new dyke incorporates a public pathway which links the proposed Metro Vancouver Delta-South Surrey Regional Greenway and to Surrey's Serpentine Greenway. Outfall improvements at Mud Bay create a self-cleaning outlet that has significantly less sedimentation, less maintenance, and fewer disturbances to foreshore habitat.</p>	   <p>DELTA SURREY CONTRACT MS 4886 001-31 DRAINAGE PACKAGE DR0406 EUGENE CREEK DIVERSION ENGINEERIN DEPARTMENT</p>
<p>East Clayton NCP: Low Impact Development and Green Infrastructure</p>		<p>The East Clayton NCP area comprises about 250 hectares (562 acres) with development beginning in early 2002, in the Cloverdale area of Surrey. East Clayton was the first development in the Lower Mainland that utilized Low Impact Development (LID) techniques and facilities on a neighbourhood scale. The need to embrace LID practices arose from the need to prevent further increases in damage to both the environment and the agricultural community resulting from the increases in runoff from urban areas.</p> <p>The East Clayton Neighbourhood Concept Plan incorporated low impact development features intended to maintain and potentially enhance natural drainage systems on site. The plan describes specific targets intended to ensure that principles of infiltration best management practices, urban forestry, and soil preservation are applied throughout the neighbourhood. Performance objectives and accompanying strategies describe goals for building sites, streets, and public green spaces.</p> <p>Implementation plans included the maintenance of Tree Canopy, creation of Detention Ponds, Disconnected Roof Leaders, 300 mm Top Soil, Exfiltration Tanks or Infiltration Swales, and permeable surfaces.</p> <p>More than a decade has passed since the East Clayton plan was implemented, and the neighbourhood has nearly built out within a ten year period. Surrey now stands at the forefront of Rainwater management planning in the Region as East Clayton provides a realistic example of how developers and engineers have tackled on the ground issues; and we are still learning what works and what can be improved on.</p> <p>Changing habitats and approaches by the City and Developers to servicing by increasing infiltration have, since included:</p> <ul style="list-style-type: none"> <li>• Better quality assurance reviews and improvements;</li> <li>• Increased awareness of and the purpose of new rainwater management measures;</li> <li>• Improved skill sets available with contractors and builders in the region; and</li> <li>• Better Installation procedures and materials for structures and pavements.</li> </ul>	