

Convening for Action in British Columbia



Integrated Rainwater Management Planning: Summary Report for ISMP Course Correction Series

Beyond the Guidebook 2010: Implementing a New Culture for
Watershed Protection and Restoration in British Columbia

Convening for Action in BC:
Visualize What We Want Our Regions to Look Like in 50 years

Create a Legacy:
Settlement Change in Balance with Ecology

1. *Influence choices by individuals and organizations*
2. *Use the term “sustainability” as a lens for considering approaches that influence choices*

© 2010 Europa Technologies
Data SIO, NOAA, U.S. Navy, NGA, GEBCO
© 2009 Google

This page intentionally left blank

Integrated Rainwater Management Planning: Summary Report for ISMP Course Correction Series

Preface

In November-December 2010, the Water Sustainability Action Plan for British Columbia released a 5-part series about considerations driving a course correction in the way 'Integrated Stormwater Management Plans' (ISMPs) are undertaken. Table 1 on the next page summarizes the five themes addressed by the series.

*Adapted from case study experience presented in **Beyond the Guidebook 2010: Implementing a New Culture for Watershed Protection and Restoration in British Columbia**, the series was developed to inform local governments and others about the implications of the paradigm-shift to landscape-based 'rainwater' from pipe-and-convey 'stormwater'.*

Now, this Summary Report provides a consolidated reference source to guide those about to embark upon an ISMP process. The Summary Report is a compendium: front-end plus all five documents in the 'ISMP Course Correction Series'. The front-end is complete with a set of five recommendations.

This compendium draws attention to successful approaches and wisdom gained by local government leaders. Collectively, they have a wealth of ISMP or related and relevant experience. They are sharing so that others can benefit.

Looking ahead, our vision is that this compendium will inform, educate and influence how infrastructure and land use professionals do business differently in a local government setting – that is, watershed protection and restoration is more likely to be achieved when land use planning and climate change adaptation are integrated with infrastructure asset management.

*Kim A. Stephens, MEng, PEng, Executive Director
Partnership for Water Sustainability in British Columbia
February 2011*

Collaboration, a 'Design with Nature' approach, and re-use of resources are keys to mitigation of unfunded infrastructure liability and adaptation to climate change

To achieve higher levels of stream, wetland and marine environment protection:

- Protect and restore urban 'green' space
- Strive for a lighter 'water footprint'
- Re-use and recycle water, energy & nutrients from liquid wastes
- Develop compact, complete communities

©2010 Google Earth Imagery
Data SIO, NOAA, U.S. Navy, NGA, GEBCO
©2009 Google

Integrated Rainwater Management Planning: Summary Report for ISMP Course Correction Series

Table 1 – An Overview of the ISMP Course Correction Series

Five Themes	Synopsis of Key Messages
1 Re-Focus on Stream Health and Watershed Outcomes	Provides regulatory and historical context, introduces guiding principles for implementing change on the ground, explains what outcome-oriented means, and sets the stage for the four stories that follow.
2 Capitalize on Green Infrastructure Opportunities to ‘Design with Nature’	Explains why ‘designing with nature’ is key to climate change adaptation; identifies what municipalities will need to do to protect or restore stream health; and introduces principles upon which a Regional Team Approach to green infrastructure implementation is founded.
3 Apply a Knowledge-Based Approach to Focus on Solutions and Outcomes	Clarifies the objectives in making the change to IRMP from ISMP, introduces the knowledge-based approach to making decisions, and highlights the ‘learnings’ by those who are demonstrating leadership in establishing outcome-oriented precedents for watershed protection through green infrastructure: Establish the vision, set the target, and then implement.
4 Move to a Levels-of-Protection Approach to Sustainable Service Delivery	Introduces the ‘infrastructure deficit’ / ‘infrastructure liability’ as a driver for the ‘course correction’, connects the dots to the Green Communities Initiative, views the Levels-of-Service concept through the land use planning and environmental lenses, and provides three examples to illustrate how local government leaders are moving forward with Sustainable Service Delivery.
5 Apply Inexpensive Screening Tools and ‘Do More with Less’	<p>Is built around City of Surrey case study experience. Now in its fifth decade of continuous implementation experience, the City continues to evolve and adapt a watershed-based approach that incorporates lessons learned in getting green infrastructure right.</p> <p>The notion of ‘shared responsibility’ is a foundation piece for collaboration, alignment and integration. When these are in place, innovation will follow. Shared responsibility is a unifying theme for two case studies described herein. They illustrate the value of looking outside the pipe.</p>

Integrated Rainwater Management Planning: Summary Report for ISMP Course Correction Series

Table of Contents

	page
Preface	i
Acknowledgments	iv
‘Urban Watershed’ Explained	v
1. Context for ISMP Course Correction	1
▪ Cost versus Value	
▪ Unfunded Infrastructure Liability	
▪ Get It Right	
2. What We Have Learned After a Decade.....	2
▪ Communities in Balance with Ecology	
▪ Sustainable Service Delivery	
▪ Regional Team Approach	
3. Leaders by Example	4
▪ Why Each is a Leader	
▪ Planning Framework	
4. How to Develop an Outcome-Oriented Plan	7
▪ Need for a Champion	
▪ What Are Lessons Learned?	
5. Summary of Findings	8
▪ From Stormwater to Rainwater	
▪ Recommended Framework for Action	
ISMP Course Correction Series	
<input type="checkbox"/> Re-Focus on Stream Health and Watershed Outcomes	
<input type="checkbox"/> Capitalize on Green Infrastructure Opportunities to ‘Design with Nature’	
<input type="checkbox"/> Apply a Knowledge-Based Approach to Focus on Solutions and Outcomes	
<input type="checkbox"/> Move to a Levels-of-Protection Approach to Sustainable Service Delivery	
<input type="checkbox"/> Apply Inexpensive Screening Tools to ‘Do More with Less’	
Table 1 – An Overview of the ISMP Course Correction Series	ii
Table 2 - City of Surrey Framework for an Holistic and Balanced ISMP	5

Integrated Rainwater Management Planning: Summary Report for ISMP Course Correction Series

Acknowledgments

This *Summary Report for the ISMP Course Correction Series* is a synthesis of contributions from many individuals involved in leading change in British Columbia, and in particular those who are named below. The front-end weaves a succinct storyline that is based on lessons learned and insights gained through experience. Furthermore, it brings together two streams of thinking: watershed-based planning, and infrastructure asset management.

As an outcome of the *ISMP Course Correction Series*, the Partnership for Water Sustainability in British Columbia and Asset Management BC have aligned their efforts to achieve a shared goal: **connect the dots between land use planning, watershed health AND infrastructure asset management**.

This collaboration represents a significant evolution in advancing a holistic approach to watershed protection and restoration in British Columbia. This alignment has since led to an article about the Series in the Asset Management BC Newsletter, published in January 2011. For ease of reference, a copy of the article is included at the end of this package.

Finally, the *ISMP Course Correction Series* would not have been possible without the contributions of many champions who are providing leadership and making a difference in the local government setting. To learn more, the reader is encouraged to read the many success stories that are presented in **Beyond the Guidebook 2010**.

Contributor	Affiliation
Carrie Baron	Drainage & Environment Manager, City of Surrey
Remi Dube	Acting Development Services Manager, City of Surrey
John McMahon	Chair, Metro Vancouver Stormwater Interagency Liaison Group (SILG) & Manager of Utilities, District of West Vancouver
Richard Boase	Vice-Chair, Water Balance Model Partnership & Environmental Protection Officer, District of North Vancouver
Jody Watson	Chair, Bowker Creek Initiative (BCI) & Harbours and Watersheds Coordinator, Capital Regional District
Stan Westby	Chair, Local Government Asset Management Working Group & Chief Administrative Officer, City of Powell River
Kim Fowler	Director of Sustainability, City of Victoria & Member of Local Government Asset Management Working Group
Wally Wells	Coordinator, Asset Management BC
Ray Fung	Chair, Green Infrastructure Partnership & Director of Engineering and Transportation, District of West Vancouver
Robert Hicks	Senior Engineer, Policy & Planning, Metro Vancouver
Glen Brown	Executive Director, Ministry of Community, Sport & Cultural Development
Ted van der Gulik	Chair, Water Balance Model Partnership & Senior Engineer, Ministry of Agriculture
Corino Salomi	Area Manager, Lower Fraser Valley, Department of Fisheries & Oceans & Member of Green Infrastructure and Water Balance Model Partnerships
Jim Dumont	Engineering Applications Authority, Water Balance Model Partnership

Integrated Rainwater Management Planning: Summary Report for ISMP Course Correction Series

‘Urban Watershed’ Explained

In *Beyond the Guidebook 2010* and in this Summary Report, the term ‘urban watershed’ is a metaphor for those watersheds, or parts of watersheds, over which local governments exert control through regulation of land use. The distinction is important because:

- In Metro Vancouver and in the Capital Regional District, for example, the majority of municipalities completely encompass their watershed areas (or else share them with adjoining municipalities).
- Outside the major metropolitan regions, on the other hand, municipalities tend to be located at the bottom end of wilderness watersheds that are subject to provincial regulation.



In British Columbia, the term ‘local government’ encompasses municipalities and regional districts. The distinction is noteworthy because municipalities and regional districts are governed by the *Community Charter* and *Local Government Act*, respectively.

The *Community Charter* empowers municipalities with extensive and very specific tools to proactively manage the complete spectrum of rainfall events. These tools enable them to achieve watershed goals and objectives. Although the *Local Government Act* provides regional districts with similar enabling powers to establish a drainage function within a service area boundary, regional districts that do not have such a service do not have the same regulatory powers as municipalities. The Ministry of Transportation and Infrastructure has historically regulated drainage in electoral areas.

British Columbia case law makes clear the responsibility of municipalities to manage runoff volume to prevent downstream impacts. An increasingly important corollary to that responsibility is the need to work from the regional down to the site scale, to maintain and advance watershed health to ensure that both water quantity and quality will be sustained to meet both ecosystem and human health needs.

While a municipality has control over HOW rainwater runoff is generated and managed within its residential, commercial and industrial land uses, it does not have the same ability to regulate watershed activities that are taking place outside its municipal boundaries.

In summary, in this document ‘**urban watershed**’ refers to drainage tributary areas within which zoning and land use are under the jurisdiction of municipalities or areas for which a regional district has established a drainage service.

This page intentionally left blank

Integrated Rainwater Management Planning: Summary Report for ISMP Course Correction Series

1. Context for ISMP Course Correction

Use of the ISMP term is unique to British Columbia. First employed by the City of Kelowna in 1998, it quickly gained acceptance to describe a watershed-based approach to integrating hydrology, ecology and land use.

In 2001, Metro Vancouver's member municipalities recognized the benefits of this approach and made a commitment to the Province to have ISMPs in place by 2014 for their watersheds. Geographically, about half of British Columbia's population resides within these watersheds. When the Province released **Stormwater Planning: A Guidebook for British Columbia** in 2002, the ISMP approach was expanded and became a recognized provincial process.

Cost versus Value

The elephant in the room is always money. Local governments have many competing priorities for spending money; lots of projects to keep staff busy; and finite resources. Everyone is challenged to do more with less, and get it done. After a decade of ISMP experience, key issues are 'cost' and 'cost versus value'. The money issue revolves around the long-term dilemma of how to pay for infrastructure and watershed improvements if there is no source of funding.

The scale of the 'ISMP money issue' is illustrated by the Metro Vancouver situation. The region has 130 watersheds. Based on typical costs generated by ISMPs to date for traditional 'pipe-and-convey' infrastructure, continuation of the *old-business-as-usual* could potentially result in an aggregate cost to the region that could easily be in the order of ~\$1.4B. For purposes of comparison, this number equates to the ~\$1.4B cost to replace the Iona Island and Lions Gate sewage treatment plants. When all priorities are considered, the region is severely challenged to finance the first \$1.4B, let alone consider another \$1.4B. The Metro Vancouver situation is not unique. Other regions have comparable challenges.

Unfunded Infrastructure Liability

Local governments in British Columbia are faced with this financial challenge: the initial capital cost of infrastructure is about 20% of the life-cycle cost; the other 80% largely represents a future unfunded liability. Thus, fiscal constraints provide a powerful impetus for doing business differently.

While developers may pay the initial capital cost of municipal infrastructure, local governments must assume responsibility for the long-term cost burden associated with operation, maintenance and replacement of infrastructure assets. Often this is not adequately funded through property taxation and utility charges. The unfunded balance is a financial liability.

Unfortunately, asset management is sometimes only considered after infrastructure is built. The challenge is to think about what infrastructure asset management entails BEFORE an asset is proposed and incorporated in a municipality's capital plan. Don't build a liability if it is not needed!

Get it Right

Population growth in BC's urban settlement areas is being accommodated to a large degree through redevelopment. From a watershed health and restoration perspective, this creates opportunities to "get it right" the second time.

After a decade of ISMP and related experience, a critical lesson learned is this: *A drainage planning process can be expected to flounder unless it is truly integrated with a blueprint for watershed redevelopment over time.*

Align efforts within a municipality. Integrate with land use and development processes. They drive the built form. A watershed vision is about the look-and-feel of the watershed landscape.

An ISMP is a potentially powerful tool. It can influence other municipal processes for the better. It can generate the blueprint for integrated and coordinated action at a watershed scale.

Integrated Rainwater Management Planning: Summary Report for ISMP Course Correction Series

2. What We Have Learned After a Decade

A decade ago, local governments were venturing into uncharted waters when undertaking ISMPs. Now, the collective experience of the Bowker Creek Initiative (in the Capital Region), the City of Surrey and other pioneer leaders such as the District of North Vancouver serves as a guide for an approach that connects with the community and gets the watershed vision right.

Communities in Balance with Ecology

The genesis for ISMPs was a desire to integrate the community, engineering, planning and environmental perspectives. Why: *To develop truly 'integrated' solutions* – that is, solutions that accommodate changes in settlement and land use while protecting property and aquatic habitat.

The implicit goal was to build and/or rebuild communities in balance with ecology. Local governments knew they had to do business differently in order to protect and/or restore watershed health. A decade later, they have the tools and experience to make a difference.

Now, the 'unfunded infrastructure liability' is a driver for local governments to consider longevity, focus on what happens after developers hand-off municipal infrastructure, get it right at the front-end, and prepare for the future. Climate change is part of the liability equation: water-centric adaptation has level-of-service implications for infrastructure.

The Province's **Living Water Smart** and **Green Communities** initiatives constitute an overarching provincial framework to restore ecological integrity within the urban fabric so that communities are in balance with ecology. This framework encompasses both the 'ISMP course correction' and infrastructure asset management. Actions and targets in Living Water Smart encourage 'green choices' that will foster a holistic approach to infrastructure management.

Sustainable Service Delivery

Tackling the unfunded infrastructure liability requires a life-cycle way of thinking about infrastructure needs, in particular how to pay for those needs over time. This holistic approach is described as **Sustainable Service Delivery**.

The paradigm-shift starts with land use planning. Connecting the dots between watershed health and infrastructure type is emerging as an important piece in 'sustainable drainage infrastructure', both fiscally and ecologically.

The financial burden and environmental impacts associated with 'pipe-and-convey' infrastructure contrast with the benefits of 'green' infrastructure at a watershed scale: *natural landscape-based assets reduce runoff volumes, have lower life-cycle costs, decrease stresses applied to creeks, and enhance urban liveability.*

Level-of-service is the integrator for everything that local governments do. Everyone will have to make level-of-service choices. Thus, a guiding principle for a watershed-based plan could be framed this way: *Establish the level-of-service that is fiscally sustainable AND protects watershed health.*

Regional Team Approach

The expression 'regional team approach' (refer to Figure 1) is resonating in British Columbia. Insertion of the word **team** in 'regional approach' has had a profound impact on how practitioners in a local government setting view their world. Team implies there is a personal commitment.

The team approach enables local governments to 'do more with less'. This is accomplished through sharing of experiences, collaboration, alignment, and pooling of resources to get the job done.

As applied to the 'ISMP course correction', a *regional team approach* would advance consistency regionally. This does NOT mean 'cookie-cutter'. It is about agreeing on expectations and how all the players will work together. After that, each community can reach its goals in its own way.

Integrated Rainwater Management Planning: Summary Report for ISMP Course Correction Series

**The 'regional team approach'
is founded on partnerships and collaboration;
and seeks to align actions at three scales –
provincial, regional and local.**



*"Everyone needs to agree on expectations
and how all the players will work together,
and after that each community can reach
its goals in its own way."*

Eric Bonham, formerly a Director
in both the Ministry of Municipal Affairs
and the Ministry of Environment

The 'regional team approach' brings together...



- **The Province** - *those who provide legislative framework*
- **Local Government** - *those who plan, regulate and...
operate, maintain, build*
- **Developers** - *those who build*
- **Stewardship Sector** – *those who advocate for conservation*
- **Agricultural Sector** – *those who grow food*
- **Academia** - *those who provide research*

Regional Team Approach Explained

Figure 1

Integrated Rainwater Management Planning: Summary Report for ISMP Course Correction Series

3. Leaders by Example

As the stories in *Beyond the Guidebook 2010* demonstrate, there are many champions in local government. The City of Surrey, Bowker Creek Initiative and District of North Vancouver stand out because of their sustained commitment to outcome-oriented approaches: *Establish the vision, set the target, and then implement.*

Why Each is a Leader

Surrey has more ISMP experience than any other jurisdiction in BC. Now in its fifth decade of continuous implementation experience, the City continues to evolve and adapt a watershed-based approach that incorporates lessons learned in getting green infrastructure built right.

The Bowker Creek Initiative demonstrates what can be accomplished through a regional team approach. Four partner local governments are implementing the *Bowker Creek Blueprint*. This is a 100-Year Action Plan to restore the watershed landscape in the heart of the Capital Region.

The District of North Vancouver is working towards a *District-wide ISMP*. The current Official Community Plan Update has created the opportunity to embed the vision for a *Watershed Landscape Restoration Strategy*. Over time, this strategy would restore the rainfall absorption capacity of its watersheds, one property at a time.

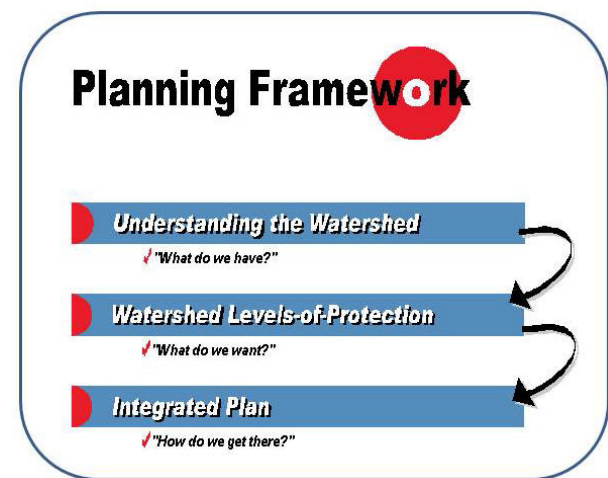


Planning Framework

Lessons learned by those who have developed watershed-based plans can help those who are about to embark on an ISMP process.

Focus on values and actions. Keep it simple. Find a starting point that is intuitive to everyone. Ensure actions are practical and easy to implement.

Think at multiple scales. Ask 'what can I do for the watershed?'.



Surrey Example: Table 2 is adapted from recent Surrey experience in commissioning seven ISMPs. The Surrey philosophy is captured colloquially by the mind-map listed below. This establishes expectations:

- Put on your boots and go for a walkabout
- After that, integrate stakeholder views
- Think through what you are proposing
- Then, and only then, do your modeling

Table 2 provides a starting point for those who wish to undertake an holistic and balanced ISMP. Surrey has evolved a four-stage process for ISMP development. The notion of 'shared responsibility' is a foundation piece for collaboration, alignment and integration. When these are in place, innovation will follow.

Integrated Rainwater Management Planning: Summary Report for ISMP Course Correction Series

Table 2 – City of Surrey Framework for an Holistic and Balanced ISMP

Guiding Philosophy

- Recognize that each watershed area is unique, and its needs are unique.
- Integrate drainage planning with land use, environment, parks, and other infrastructure and community needs.
- Model the drainage system after there is some concept of overall direction – do not model just to model.
- Have short, medium and long term goals / visions for the plan area, complete with integration of opportunities.

The Process

Stage 1 – “What Do We Have?”

Stage 2 – “What Do We Want?”

Stage 3 – “How Do We Put This Into Action?”

Stage 4 – “How Do We Stay On Target?”

Balanced Goals

As part of defining “what we want”, the City identified these balanced goals:

- Protect and enhance the overall health and natural resources of the watershed;
- Promote participation from all stakeholders to achieve a common future vision of the watershed;
- Minimize risk of life and property damages associated with flooding and provide strategies to attenuate peak flows;
- Protect and enhance watercourses and aquatic life;
- Prevent pollution and maintain / improve water quality;
- Prepare an inventory of watercourses and wildlife for the watershed;
- Protect the environment, wildlife, and habitat corridors;
- Identify areas of existing and future agricultural, residential, commercial, and recreational land uses;
- Develop a cost effective and enforceable implementation plan; and,
- Establish a monitoring and assessment strategy to ensure goals are achieved, maintained, and enforced.

Integrated Rainwater Management Planning: Summary Report for ISMP Course Correction Series

Scope of the Four Stages

Stage 1: "What Do We Have?" Review Existing Information and Data Collection

1. A review of existing information;
2. Watershed field reconnaissance and data collection;
3. Definition of hydrologic and hydraulic conditions; and
4. A public open house to begin dialogue on community objectives.

Stage 2: "What Do We Want?" Vision for Future Development

To achieve the goals, the requirements for developing a vision encompass:

5. Land use plans which will be developed to identify future land use types, stream setbacks, wildlife corridors, potential pond locations and any other opportunities or constraints for development
6. Stakeholder involvement through a public open house meeting.
7. Hydrogeological assessments;
8. Environmental assessments for habitat protection and enhancement;
9. Innovative Low Impact Development (LID) techniques and rainwater Best Management Practices (BMP) to mitigate against impacts to the lowland areas, reduce runoff volume through source controls, decrease stream velocity, protect water quality, provide erosion protection, and maintain baseflows to streams; and
10. Sound, proven numerical hydrologic and hydraulic modelling techniques.

Stage 3: "How do we put this into action?" Implementation Plan, Funding Strategies, and Enforcement Strategies

11. A review of the existing Design Criteria to assess which are appropriate for this ISMP and what should be added or modified;
12. A long-range capital works plan;
13. Cost analysis;
14. A project approvals procedure;
15. A funding strategy;
16. A by-law enforcement strategy which identifies existing and missing bylaws; and
17. A list of action items with time scales.

Stage 4: "How do we stay on target?" Monitoring and Assessment Plan

18. Creation of a strategic plan for monitoring and assessing that includes an explanation of why data needs to be collected and assessed in a monitoring program and how to interpret the collected data.
19. Provision of a summary of key performance indicators (KPIs), both qualitative and quantitative with a sensitivity analysis to indicate the relative magnitude of flexibility that resides in each identified KPI.
20. Summary of the type, duration, and frequency of monitoring associated with each KPI.

Integrated Rainwater Management Planning: Summary Report for ISMP Course Correction Series

4. How to Develop an Outcome-Oriented Plan

An *outcome*-oriented plan should provide a clear picture of how local governments can apply land use planning tools to create a future watershed condition desired by all. This approach contrasts with an *output*-oriented approach where the primary emphasis is on data collection, computer modeling and pipe analyses; and results in an enhanced Master Drainage Plan.

Need for a Champion

A local government cannot delegate creation of a watershed vision. There **must** be a champion within a local government – someone who will be willing and able to provide time, energy, passion and organizational drive to bring people together. It will then require an inclusive process to reach consensus on actions that will protect and/or restore watershed health.

Unless there is a champion, the process will not succeed. Once a champion is identified and/or steps forward to provide leadership, embracing the set of principles listed below will lead to a successful process and project outcome:

- ❑ **Build Trust**
- ❑ Solve the Right Problem
- ❑ Avoid Useless Data
- ❑ Manage Risk and Liability
- ❑ Put Interest and Values First
- ❑ Avoid Advocacy Positions
- ❑ Find Lowest Cost Solution
- ❑ Track Progress
- ❑ Ensure Effective Communication
- ❑ Learn from Mistakes
- ❑ Share Lessons Learned

To learn more about the ‘people side’ of developing an outcome-oriented plan, the reader is referred to Chapter 11 in *Stormwater Planning: A Guidebook for British Columbia*. The chapter is titled ‘Building Consensus and Implementing Change’.

What Are Lessons Learned?

The steering committee for the Bowker Creek Initiative (BCI) has identified seven distinguishing characteristics (‘key messages’) that capture the essence of their lessons learned and experience gained. There is a story behind each ‘learning’, and the BCI Steering Committee is keen to share those stories. Stories are central to the founding of the Initiative and development of the Blueprint.

Community Values Drive BCI and Blueprint:

The partnership has enabled community groups and municipal staffs to coalesce around a shared vision for watershed restoration over time.

Coordinator Role is Crucial: In a five year review of the BCI, all partners agreed that having a dedicated part-time coordinator was the most important factor contributing to successes to date.

Outreach – A Powerful Tool: Community groups and individuals have taken ownership and responsibility for “telling the Bowker story”.

Commit to the Vision: The US versus THEM way-of-thinking changed to the WE paradigm. The players around the table realized that they can help each other.

Integrate Watershed and Creek Actions:

Community representatives and municipal staffs must be hands-on in developing a watershed restoration plan. Involvement is what creates the sense of ownership.

Blueprint Allows for Climate Change:

Good urban watershed management overlaps with climate change action – e.g. riparian restoration.

Vancouver Island and Metro Vancouver are learning from each other, and are moving in the same direction. Vancouver Island experience has informed and influenced elements of the *Metro Vancouver Integrated Liquid Waste & Resource Management Plan*, in particular those actions that will advance a ‘regional team approach’.

Integrated Rainwater Management Planning: Summary Report for ISMP Course Correction Series

5. Summary of Findings

The linkage to infrastructure asset management is a way to (re)focus ISMPs on outcomes: *create a vision of a future watershed complete with intact environmental values, healthy streams, abundant fishery resources, and a functional infrastructure.*

By 'designing with nature', local governments could make a very strong case for a 'sustainable drainage system', at a lower life-cycle cost.

From Stormwater to Rainwater

The way we see the world is shaped by our choice of vocabulary. Other languages use more exact terms than English, and this changes how relationships and worth are perceived.

Use of the word 'stormwater' is dated because it is associated with a 'pipe-and-convey' engineering philosophy; and reflects a single function view of the rainwater resource. Furthermore, stormwater is created by human activities.

All in all, the 'stormwater' way of thinking is the antithesis of RAINwater management – which is holistic, landscape-based, seeks to capture rain where it falls, and is guided by a 'design with nature' philosophy. Thus, the time is now right to make the vocabulary change to **IRMP** from ISMP, where IRMP is the acronym for **Integrated Rainwater Management Plan**. This re-branding would help facilitate the current paradigm-shift in the local government setting.

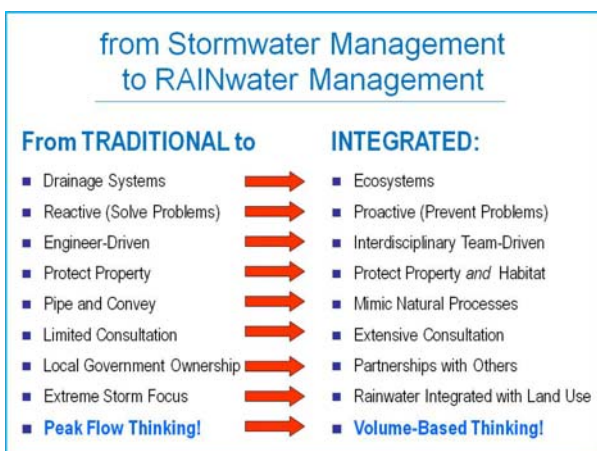
Recommended Framework for Action

Local governments can protect watershed health and mitigate the unfunded infrastructure liability via a 'design with nature' approach to greening infrastructure practices. Through a watershed-based plan, local governments can strategically connect the dots between land use planning, development, watershed health AND asset management.

ISMP Course Correction Series: To help and guide those about to embark upon an ISMP, IRMP or comparable watershed-based planning process, a recommended framework would comprise these five actions:

1. Re-Focus on Stream Health and Watershed Outcomes
2. Capitalize on Green Infrastructure Opportunities to 'Design with Nature'
3. Apply a Knowledge-Based Approach to Focus on Solutions and Outcomes
4. Move to a Levels-of-Protection Approach to Sustainable Service Delivery
5. Apply Inexpensive Screening Tools to 'Do More with Less'

Each action is supported by a stand-alone document in the accompanying 5-part *ISMP Course Correction Series*. These documents add depth to the 4-stage process laid out in Table 2.



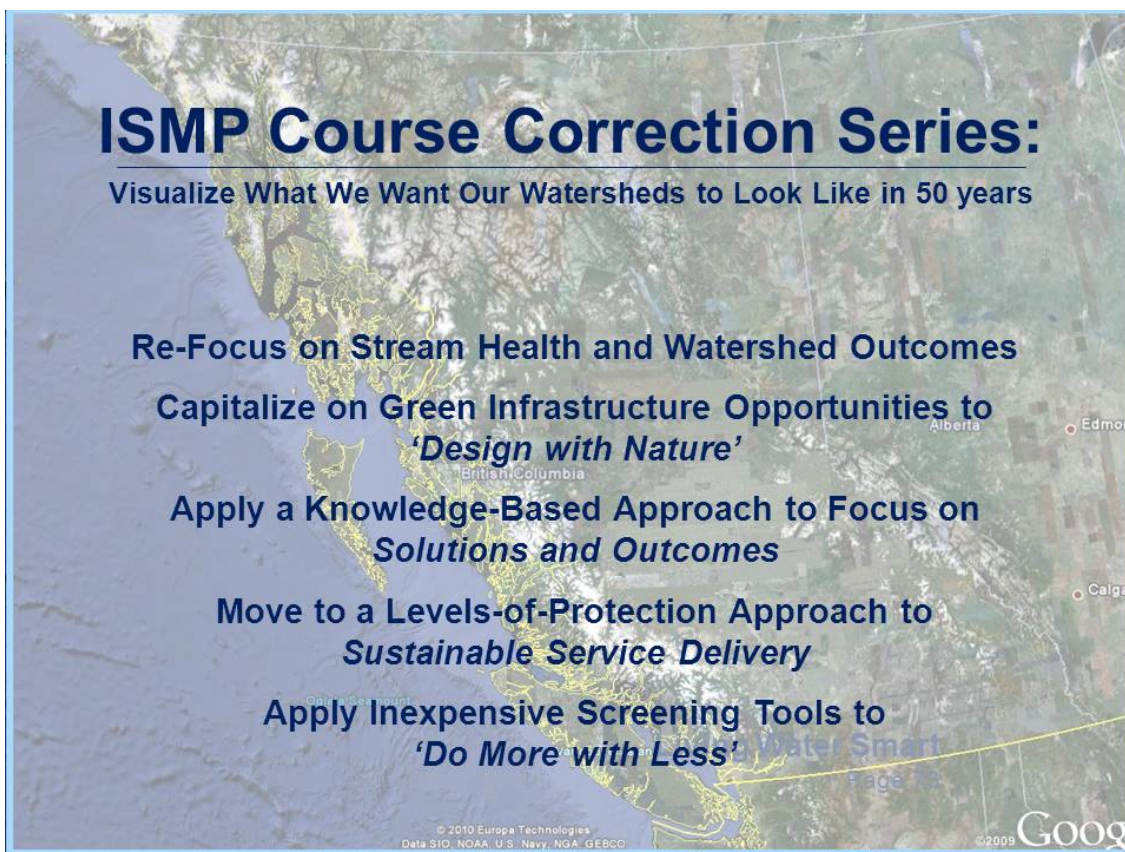
Shared Responsibility



"Once we know what we want our watersheds and neighbourhoods to look like, the next step is to decide what the tools are that will get us there. All of us.... whether we are regulators, developers or designers.... need to understand and care about the goal if we are to create the future that we all want."

Vincent Lalonde, General Manager,
Engineering Division, City of Surrey
February 2009

Integrated Rainwater Management Planning: Summary Report for ISMP Course Correction Series



Convening for Action in British Columbia



Integrated Rainwater Management Planning: Re-Focus on Stream Health and Watershed Outcomes

Beyond the Guidebook 2010: Implementing a New Culture for
Watershed Protection and Restoration in British Columbia

Convening for Action in BC:

Visualize What We Want Our Regions to Look Like in 50 years

Create a Legacy: Settlement Change in Balance with Ecology

1. *Influence choices by individuals and organizations*
2. *Use the term “sustainability” as a lens for considering approaches that influence choices*

Integrated Rainwater Management Planning: Re-Focus on Stream Health and Watershed Outcomes

Water Bucket Web Story #1 in the ISMP Course Correction Series

Preface

*This article is the first in a series that is designed to inform local governments and others about **Integrated Stormwater Management Plans** (ISMPs): what they are; how local governments can do more with less; and how local governments can ensure ISMPs are outcome-oriented.*

An ISMP is a potentially powerful tool to achieve a vision for 'green' development, one that protects stream health, fish habitat and fish. Local governments now have a decade of experience from which to extract lessons learned.

*Local government experience in Metro Vancouver and on Vancouver Island has informed the 'ISMP course correction' described in **Beyond the Guidebook 2010: Implementing a New Culture for Watershed Protection and Restoration in British Columbia**.*

*This Story #1 provides regulatory and historical context, identifies introduces guiding principles for implementing change on the ground, explains what **outcome-oriented** means, and sets the stage for the four stories that follow.*



Integrated Rainwater Management Planning: Re-Focus on Stream Health and Watershed Outcomes

Water Bucket Web Story #1 in the ISMP Course Correction Series

Historical / Regulatory Context for ISMPs

Use of the ISMP term is unique to British Columbia. First used by the City of Kelowna in 1998, the term quickly gained widespread acceptance by local governments and environmental agencies to describe a comprehensive approach to watershed-based planning in an urban context.

The Province recognizes that communities are in the best position to develop solutions which meet their own unique needs and local conditions. Historically, then, the Province has enabled local government by providing policy and legal tools in response to requests from local government. The enabling approach means the onus is on local government to align local actions with provincial and regional policies, and embrace *shared responsibility*.

Plan at Four Scales – Regional, Watershed, Neighbourhood and Site

When the Province released **Stormwater Planning: A Guidebook for British Columbia** in June 2002, the ISMP approach became a recognized provincial process. Although *Integrated Watershed Management Plan* better described what was envisioned at that time, use of IWMP was not an option because the Province had an existing IWMP process for natural resource management in wilderness watersheds.

In 2002, the Guidebook introduced a set of five guiding principles for ISMPs. These are captured by the acronym ADAPT (see Figure 1 on next page), where the “P” stands for *Plan at four scales - regional, watershed, neighbourhood and site*.

In integrating actions at four scales, the intended purpose of an ISMP is to provide a clear picture of how local governments can be proactive in applying land use planning tools to protect property and aquatic habitat, while at the same time accommodating land development and population growth.

Manage Runoff Volume at Site Scale to Protect Watershed Health

In *Beyond the Guidebook 2010*, the term ‘urban watershed’ is a metaphor for those watersheds, or parts of watersheds, over which local governments exert control through regulation of land use. The *Community Charter* empowers British Columbia municipalities with extensive and very specific tools to proactively manage the complete spectrum of rainfall events.

In addition, British Columbia case law makes clear the responsibility of municipalities to manage runoff volume to prevent downstream impacts. An increasingly important corollary to that responsibility is the need to work from the regional down to the site scale, to maintain and advance watershed health to ensure that both water quantity and quality will be sustained to meet both ecosystem and human health needs.

Living Water Smart, British Columbia’s Water Plan

Released in June 2008, **Living Water Smart, British Columbia’s Water Plan** provides a clear statement of provincial policy vis-à-vis how land will be developed and water will be used. Furthermore, the 45 actions and targets in Living Water Smart encourage ‘green choices’ that will flow through time, and will be cumulative in creating liveable communities, reducing wasteful water use, and protecting stream health.

The **Water Sustainability Action Plan for British Columbia** is aligned with Living Water Smart, and is a primary implementation interface with local government. The Action Plan program is providing engineers and planners in a local government setting with tools to effect changes in land development, infrastructure servicing and water use practices. The program is also showcasing what local government implementers are doing on the ground.

Integrated Rainwater Management Planning: Re-Focus on Stream Health and Watershed Outcomes

Water Bucket Web Story #1 in the ISMP Course Correction Series



- A**gree that stormwater is a resource
- D**esign for the complete spectrum of rainfall events
- A**ct on a priority basis in at-risk drainage catchments
- P**lan at four scales – regional, watershed, neighbourhood & site
- T**est solutions and reduce costs by adaptive management

Guiding Principles of Integrated Rainwater Management

Figure 1

Integrated Rainwater Management Planning: Re-Focus on Stream Health and Watershed Outcomes

Water Bucket Web Story #1 in the ISMP Course Correction Series

Success Will Follow When....

Beyond the Guidebook 2010 tells the stories of the champions who are implementing change on the ground. Equally important, this guidance document also presents a framework for establishing watershed-specific performance targets and implementing green infrastructure through an ISMP-type process.

Lessons Learned

There is now a decade of ISMP experience from which to extract 'lessons learned' about how to move from awareness (interest) to action (practice). *Beyond the Guidebook 2010* draws on BC case study experience to illustrate how success will follow when local government elected representatives, administrators and practitioners apply these guiding principles:

1. Choose to be enabled.
2. Establish high expectations.
3. Embrace a shared vision.
4. Collaborate as a 'regional team'.
5. Align and integrate efforts.
6. Celebrate innovation.
7. Connect with community advocates.
8. Develop local government talent.
9. Promote shared responsibility.
10. Change the land ethic for the better.

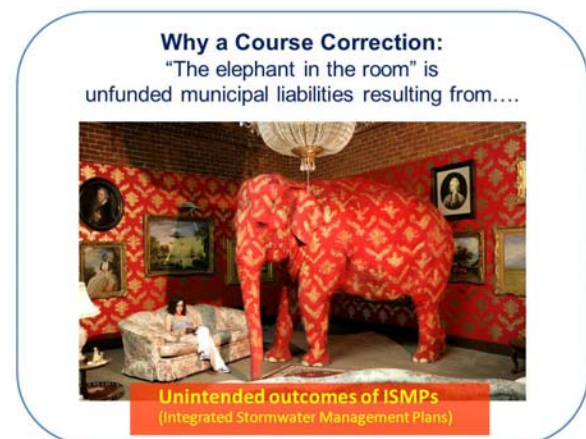
The **Bowker Creek Blueprint** is precedent-setting, and is a prominent example of a plan that embodies all ten guiding principles. The Bowker Creek Blueprint is about systematically restoring the urban heartland of the Capital Regional District as it redevelops over the decades. The Bowker experience illustrates how major breakthroughs happen when decision makers in government collaborate with grass-roots visionaries in the community to create desired outcomes.

The Elephant in the Room

The elephant in the room is always money. Municipalities have lots of competing interests for spending money; lots of projects to keep staff busy; and finite financial resources. Everyone is challenged to do more with less and get it done. An issue that has emerged on both sides of the Georgia Basin is 'cost versus value' in developing ISMPs.

The unintended consequences of some ISMPs undertaken in Metro Vancouver and on Vancouver Island have informed the course correction described in *Beyond the Guidebook 2010*. "Unfortunately, ISMPs completed to date have tended to be engineering-centric, and in general can be described as 'glorified' master drainage plans. ISMPs that do not integrate land use and drainage planning are resulting in unaffordable multi-million dollar infrastructure budget items that become municipal liabilities, without providing offsetting stream health benefits," stated the Metro Vancouver Liquid Waste Management Plan Reference Panel in its Final Report to the Metro Vancouver Board in July 2009.

This finding led the Reference Panel to recommend that Metro Vancouver municipalities "re-focus **Integrated RAINwater/Stormwater Management Plans** on watershed targets and outcomes so that there are clear linkages with the land use planning and development approval process."



Integrated Rainwater Management Planning: Re-Focus on Stream Health and Watershed Outcomes

Water Bucket Web Story #1 in the ISMP Course Correction Series

What 'Outcome-Oriented' Means

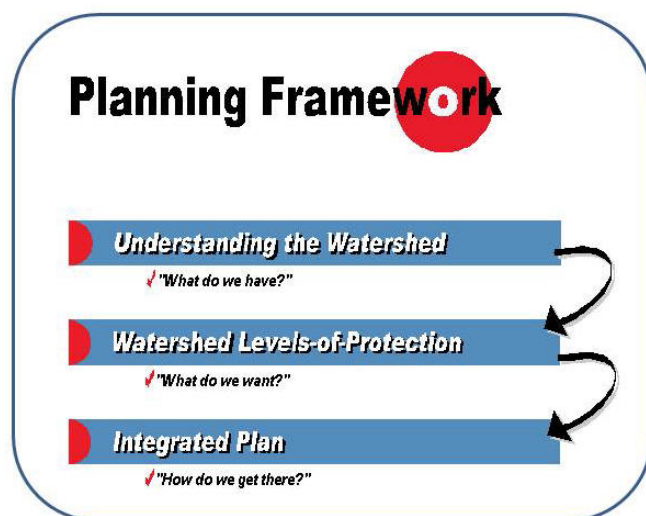
Outcome-oriented planning is a problem-solving PROCESS. It is not a procedure. It is not a matter of applying a regulation or a checklist. Going through a process becomes *talent development*. Participants have to be committed to the outcome. To get there, they have to function as a team. It is the talent development process that enables development of outcome-oriented plans. It is very definitely a grounded approach.

Focus on Values and Actions

Experience has demonstrated that four ingredients will be in the mix when practitioners in a local government setting undertake to develop outcome-oriented plans. The participants will have to collaborate to:

1. Define the problem
2. Declare the community's values
3. Select and apply the right tools
4. Wrestle with the solutions

This is not high-level or theoretical language. It is about hard work and applying common sense. Mutual support and the shared process are also critical. This is what has been learned from successful outcome-oriented processes such as the Bowker Creek Blueprint. Focus on values and actions. Keep it simple. Find a starting point that is intuitive to everyone. Ensure actions are practical and easy to implement.



Looking Ahead

The Guidebook is a pioneer application in North America of 'adaptive management' in a rainwater management setting. In fact, this is one of the five guiding principles for ISMPs. In the Guidebook, *adaptive management* means: **We change direction when the science leads us to a better way.**

Leading Change in British Columbia

After a decade of 'learning by doing', it is now timely to reflect on the experience of those local governments that are leading change in British Columbia. Accordingly, themes for stories in the *ISMP Course Correction Series* are previewed as follows:

- Story #2: *Capitalize On Green Infrastructure Opportunities to 'Design with Nature'*
- Story #3: *Apply a Knowledge-Based Approach to Focus on Solutions and Outcomes*
- Story #4: *Move to a Level-of-Protection Approach to Sustainable Service Delivery*
- Story #5: *Apply Inexpensive Screening Tools to 'Do More With Less'*

The case study experience introduced in *Beyond the Guidebook 2010* shows that a new land ethic is taking root in BC. Changing the culture requires a process. This takes time to complete. There is no short-cut; however, lessons learned by those who have done it can help those who want to do it.

Convening for Action in British Columbia



Integrated Rainwater Management Planning: Capitalize on Green Infrastructure Opportunities to 'Design with Nature'

Beyond the Guidebook 2010: Implementing a New Culture for
Watershed Protection and Restoration in British Columbia

Convening for Action in BC: Visualize What We Want Our Regions to Look Like in 50 years

Create a Legacy: *Settlement Change in Balance with Ecology*

- 1. Influence choices by individuals and organizations*
- 2. Use the term "sustainability" as a lens for considering approaches that influence choices*

Integrated Rainwater Management Planning: Capitalize on Green Infrastructure Opportunities to 'Design with Nature'

Water Bucket Web Story #2 in the ISMP Course Correction Series

Preface

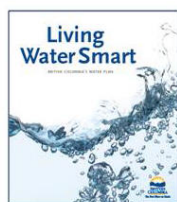
*This article is the second in a series that is designed to inform local governments and others about **Integrated Stormwater Management Plans (ISMPs)**: what they are; how local governments can do more with less; and how local governments can ensure ISMPs are outcome-oriented.*

An ISMP is a potentially powerful tool to achieve a vision for 'green' development, one that protects stream health, fish habitat and fish. Local governments now have a decade of experience from which to extract lessons learned.

*Local government experience in Metro Vancouver and on Vancouver Island has informed the 'ISMP course correction' described in **Beyond the Guidebook 2010: Implementing a New Culture for Watershed Protection and Restoration in British Columbia**.*

*Since 2002, "integrated drainage plans" have typically been called "ISMPs" pursuant to the nomenclature established in **Stormwater Planning: A Guidebook for British Columbia**. The time has now come to describe truly integrated plans as "IRMPs" to reflect the paradigm-shift from pipe-and-convey 'stormwater' to landscape-based 'RAINwater'.*

This Story #2 explains why 'designing with nature' is key to climate change adaptation; identifies what municipalities will need to do to protect or restore stream health; and introduces principles upon which a Regional Team Approach to green infrastructure implementation is founded.



A Call to Action

Partnerships	Better Information
Legislation	Incentives

Living Water Smart, BC's Water Plan

and the **Green Communities Initiative**
provide a vision of what the regions of our province
can look like if local governments.....

- ☐ prepare communities for climate change,
- ☐ choose to live water smart, and
- ☐ strive to build greener communities

Integrated Rainwater Management Planning: Capitalize on Green Infrastructure Opportunities to 'Design with Nature'

Water Bucket Web Story #2 in the ISMP Course Correction Series

Climate Change Adaptation Context for ISMPs

An ISMP is a tool for integrating actions at four scales: regional, watershed, neighbourhood, and site. Thus, an outcome-oriented ISMP can provide a clear picture of how local governments can be proactive in applying land use planning tools to create the future desired by all:

What do we want this watershed to look like in 100 years, and what steps will we take to get there?

When the ISMP approach was introduced a decade ago, it reflected a significant paradigm-shift in community values. The implicit goal was to build and/or rebuild communities in balance with ecology – that is, accommodate development while protecting property and aquatic habitat. A decade later, climate change has become an integral part of the equation.

Prepare for Climate Change

There are two responses to climate change: mitigation and adaptation. **Mitigation** is about alleviating the effects of climate change through greenhouse gas reduction. **Adaptation** is about responding to the changes that will inevitably occur. Thus, the Province's perspective is that:

- Mitigation and adaptation are both necessary and complementary strategies to cope with the climate change challenge.
- If mitigation is about CARBON, then adaptation is about WATER.
- By choosing to live water smart and build greener neighbourhoods, communities will be more prepared for climate change.

Living Water Smart, BC's Water Plan and the **Green Communities Initiative** are both about adaptation. They encourage 'shared responsibility' in the local government setting so that 'green choices' by all players will achieve 'design with nature' outcomes.

Understand the Water Balance

Figure 1 illustrates the progressive changes in hydrology and resulting impacts on stream health when land use change alters the Water Balance. Hence, the lynch-pin of Living Water Smart is this objective:

- *By 2012, all land and water managers will know what makes a stream healthy, and therefore be able to help land and water users factor in new approaches to securing stream health and the full range of stream benefits.* (p 43 in Living Water Smart)

As total runoff volume increases (as impervious area increases), so does the frequency of the channel-forming event. As volume increases, the stream channel erodes to expand its cross-section.

A critical parameter for erosion is the number of runoff events per year that equal or exceed the magnitude and duration of the natural channel-forming event – i.e. before urbanization and/or climate change altered the Water Balance.

Build Greener Communities

Stream health is a function of flow duration, and therefore correlates with stream erosion. Flow duration can be measured and verified. Similarly, the potential for erosion or sediment accumulation within a watershed can also be assessed.

The foundation for *RAINwater Management* is estimation of the amount of water in the stream over a long period of time. This provides the linkage between the needs of the aquatic environment and the potential to physically alter the stream with increased erosion induced by urban development and/or climate change.

Building greener communities by 'designing with nature' creates opportunities to adapt to changes in the Water Balance. When the *built environment* is enhanced through a water-centric approach, and is guided by 'design with nature' principles, the resulting benefits cover a spectrum of outcomes - from community liveability to stream health.

Integrated Rainwater Management Planning: Capitalize on Green Infrastructure Opportunities to 'Design with Nature'

Water Bucket Web Story #2 in the ISMP Course Correction Series

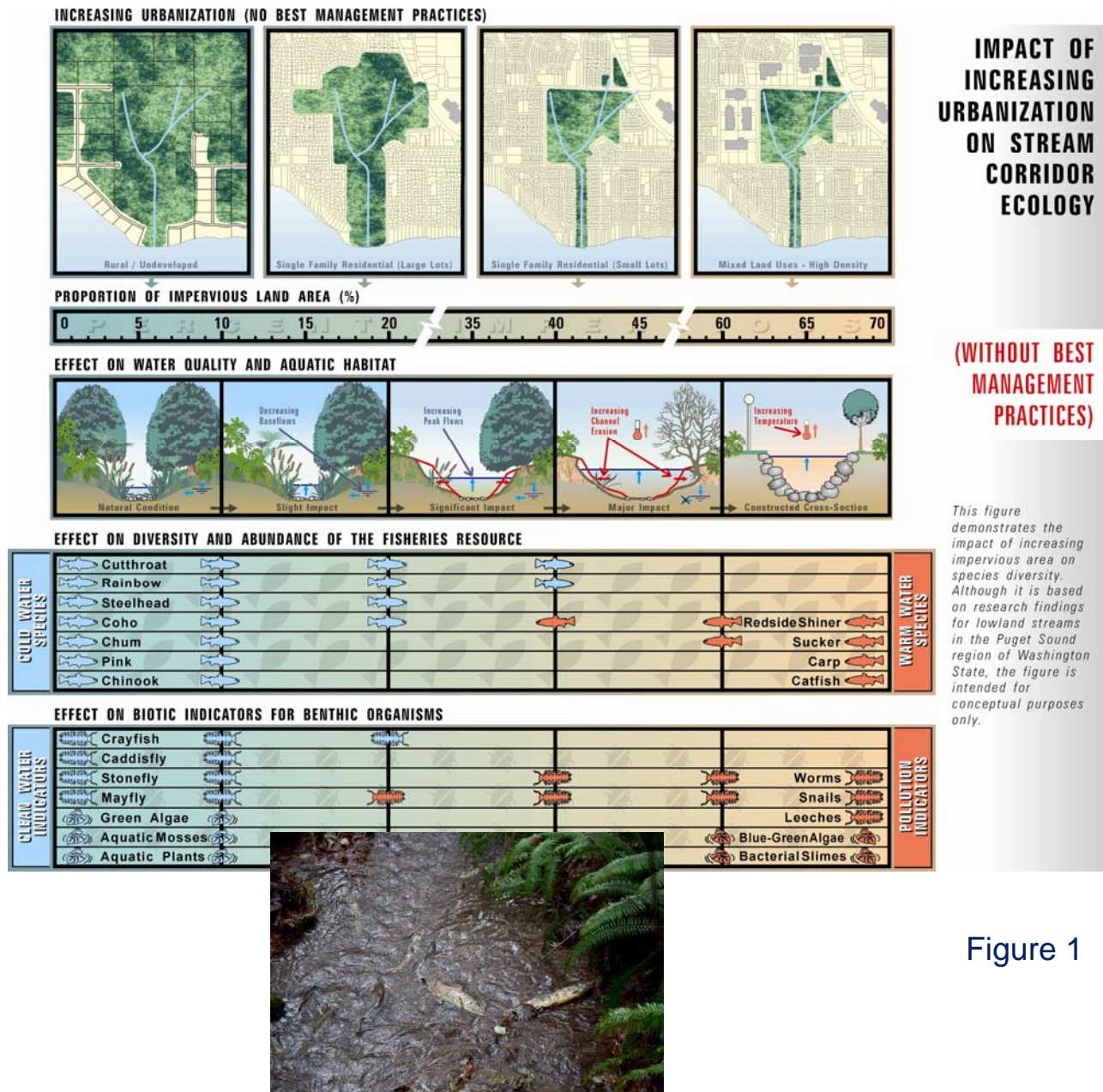


Figure 1

Source: Stormwater Planning: A Guidebook for British Columbia, 2002

Integrated Rainwater Management Planning: Capitalize on Green Infrastructure Opportunities to 'Design with Nature'

Water Bucket Web Story #2 in the ISMP Course Correction Series

'Design with Nature' Explained

Figure 2 below defines what the 'design with nature' goal means from a local government perspective. The graphic is both a backdrop and a mind-map for *Beyond the Guidebook 2010: Implementing a New Culture for Urban Watershed Protection and Restoration in British Columbia*, released in June.

The 'design with nature' paradigm is adapted from the title of the seminal book by Ian McHarg, published in 1969. Experience shows that it is intuitive, it resonates, and it serves as a focal point for changing the *land ethic* for the better.

Designing with nature captures the essence of climate change adaptation. As stated on page 1, adaptation is about responding to the changes that will inevitably occur. Adaptation is at the community level and is therefore about collaboration.

Settlement Change in Balance with Ecology

As communities develop and/or redevelop, the desired outcome in 'designing with nature' is that settlement change will be in balance with ecology. It is all about changing the land ethic.

In 2002, **Stormwater Planning: A Guidebook for British Columbia** was a catalyst for action to implement a 'design with nature' approach to rainwater management and green infrastructure. The Guidebook applied a science-based understanding, developed the water balance methodology to establish performance targets, and demonstrated that urban watershed restoration could be accomplished over a 50-year timeframe as and when communities redevelop.

The premise underpinning the Guidebook was that land development and watershed protection can be compatible. The basis for this premise was that municipalities exert control over runoff volume through their land development and infrastructure policies, practices and actions.

Collaboration, a 'Design with Nature' approach, and re-use of resources are keys to climate change adaptation

- Develop compact, complete communities
- Increase transportation options
- Re-use and recycle water, energy and nutrients from liquid wastes
- Protect and restore urban 'green' space
- Strive for a lighter 'hydrologic footprint'
- Achieve higher levels of stream, wetland and marine environment protection



Figure 2

Integrated Rainwater Management Planning: Capitalize on Green Infrastructure Opportunities to 'Design with Nature'

Water Bucket Web Story #2 in the ISMP Course Correction Series

Green Infrastructure Opportunities

If one goes back 10 years, there was a void of policy and legislation vis-à-vis green infrastructure. This led British Columbia down an educational path as the logical alternative to a prescriptive approach.

It has taken patience and consistent messaging over the past decade to incrementally build consensus, facilitate a culture change, and start implementing a new way of doing business.

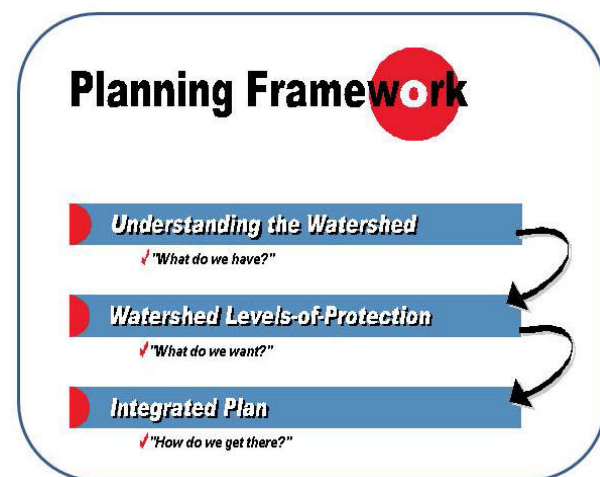
The case study experience introduced in *Beyond the Guidebook 2010* shows that a new land ethic is taking root in BC. Local governments have the tools and case study experience to 'design with nature'. BC is now at a tipping point.

Planning Framework

Lessons learned by those who have done it can help those who want to ensure that pending and/or future settlement change (development) is in balance with ecology.

Focus on values and actions. Keep it simple. Find a starting point that is intuitive to everyone. Ensure actions are practical and easy to implement.

Think at multiple scales. Ask 'what can I do for the watershed?'.



Fisheries & Oceans Perspective

Corino Salomi is DFO Area Manager for the Lower Fraser Valley. His area of responsibility extends from Mount Currie to Boston Bar. This allows him to see the big picture in terms of region-wide action on the ground.



"We are seeing broad awareness and application of green infrastructure across the South Coast region," states Corino. "At the same time, and keeping in mind that the objective is to maintain stream health, we can characterize the current situation as being one of *missed opportunities* to consistently do business differently and better on individual properties."

An Example of Seizing an Opportunity: "That's why, for example, it is heartening when I see pavement being cut to create a 'bus bulge' in the City of North Vancouver to minimize the impact of rainwater runoff on the City's small streams. The City is doing the little things needed to create cumulative benefits over time."

"Installing rain garden features like those on a busy street like Lonsdale takes dedication and in my opinion demonstrates the kind of leadership needed to bring about improvements in how rainwater is viewed and managed. This is an example of seizing, not missing, an opportunity."



Integrated Rainwater Management Planning: Capitalize on Green Infrastructure Opportunities to 'Design with Nature'

Water Bucket Web Story #2 in the ISMP Course Correction Series

Implementing the Course Correction

"Almost a decade ago I began representing DFO in dealing with local government and the development community regarding land use issues," continues Corino Salomi. "At that time, we knew what needed to be done to protect ecological integrity. When I participated in inter-governmental meetings, I would ask those around the table: what is taking so long; when are we going to have some action?"

"Now, when I look back at the record of the past 10 years, I have admiration for what so many have been accomplishing. I also have a heightened appreciation of the extent to which development issues are complicated and/or complex, and therefore require the holistic approach that is RAINwater management."

The Process: Vision → Target → Implement

"When it was first conceived in 2001, the ISMP Template was a great concept but there have been challenges with its application. By 2005, it had evolved into a significant document that demonstrates the complexity of addressing development issue at a watershed level. On the other hand, the ISMP Template clearly shows that maintaining watershed or stream health can be as simple as committing to protecting riparian areas and managing rainwater."

"People have asked: does a municipality really need to spend \$200,000 for a report concluding they should maximize rainfall capture in the watershed? That question resulted in the term **"ISMP-Light"** or a minimum level effort ISMP based on commitments to riparian protection and site level rainwater management."

"The validity of this thinking is reinforced by what the Bowker Creek Initiative has demonstrated in the Capital Regional District, and what the Metro Vancouver Reference Panel is now telling us. Establish the vision, set the target and then implement."

Move from Planning to Action

Table 2 in *Beyond the Guidebook 2010* identifies what municipalities will need to do to create liveable communities and protect or restore stream health.

The framework presented in Table 2 will help local governments make the needed ISMP course correction. Released in 2008, it presents a conceptual framework for setting watershed-specific performance targets and then implementing them at the development scale. There must be clear linkages between the targets and development approval processes.

"We have tools such as the Water Balance Model and we have many on-the-ground examples of how to capture rain where it falls," states Corino Salomi. "Municipalities just need to get on with applying the tools and the experience so that they capitalize on opportunities rather than *missing opportunities*."

Establish Watershed-Specific Targets

"Future population growth in the Georgia Basin will largely be accommodated in partially or significantly developed watersheds. Redevelopment creates opportunities to get it right the second time around, one property at a time. This is why the Bowker Blueprint is such an important precedent. It is about restoring the ecological integrity of the urban landscape over decades."

"To make that happen, there needs to be a roadmap (blueprint) so that community liveability AND stream health both benefit from property redevelopment opportunities. This requires an ISMP that is guided by a 'connect the dots' type of thinking that establishes achievable and watershed-specific targets."

"Rainwater management has a bigger picture. It is not just about drainage. Non-point source pollution, species at risk, ecosystem functions, and drought management are all coming to the forefront. Everything is linked. So, watershed targets and land development solutions must be holistic in scope," concludes Corino Salomi.

Integrated Rainwater Management Planning: Capitalize on Green Infrastructure Opportunities to 'Design with Nature'

Table 2 (brought forward from Chapter 7 in 'Beyond the Guidebook 2010')

Developing Outcome-Oriented Watershed Plans: Framework for Moving from Planning to Action

Action	Level of Commitment
Complete and implement integrated rainwater/stormwater management plans that are affordable and effective in protecting or restoring Watershed Health	<ul style="list-style-type: none"> Local governments, in collaboration with senior governments, develop Integrated Plans that enable implementation of integrated strategies for greening the built environment; and include establishing watershed-specific runoff targets (for managing the complete rainfall spectrum) that make sense, meet multiple objectives, are affordable, and result in net environmental benefits at a watershed scale. <p><i>(Note: To date, "integrated drainage plans" have typically been called "ISMPs" pursuant to the nomenclature established in Chapter 9 of the 2002 Guidebook. The time has come to describe truly integrated plans as "IRMPs" to reflect the paradigm-shift from pipe-and-convey 'stormwater' to landscape-based 'RAINwater')</i></p>
	<ul style="list-style-type: none"> Local governments, in collaboration with senior governments, establish watershed targets that are characteristic of actual conditions in watersheds, recognizing that there will be different strategies for already developed versus partially developed watersheds.
	<ul style="list-style-type: none"> Local governments, in collaboration with senior governments, evaluate the acceptability of watershed-specific runoff targets on the basis of an evaluation framed by these three questions: <ol style="list-style-type: none"> 1. What target will achieve the watershed health objective? 2. What needs to be done to make the target achievable? 3. Do the solutions meet the test of affordability and multiple objectives?
	<ul style="list-style-type: none"> Local governments, in collaboration with senior governments, implement green infrastructure solutions that result in effective rainfall management at the site, catchment and watershed scales.
Embed "IRMP" landscape-based strategies in neighbourhood concept plans	<ul style="list-style-type: none"> Local governments develop rainwater/stormwater and land use plans through an inter-departmental process that is collaborative and integrated. Local governments provide guidance as to how watershed-specific targets can be met at the development scale.

Source: **Commentary on Effective Municipal Rainwater/Stormwater Management and Green Infrastructure to Achieve Watershed Health**, April 2008

Released jointly by the Green Infrastructure Partnership and the Inter-Governmental Partnership in conjunction with the consultation process for Metro Vancouver's *Integrated Liquid Waste & Resource Management Plan*

The Commentary is accompanied by a paper titled *Beyond the Guidebook: Establish Watershed-Specific Runoff Capture Performance Targets*, released at the 2008 Water Balance Model Partners Forum.

Integrated Rainwater Management Planning: Capitalize on Green Infrastructure Opportunities to 'Design with Nature'

Water Bucket Web Story #2 in the ISMP Course Correction Series

Collaboration, Alignment and Consistency

Commencing in 2005, 'convening for action' programs have been initiated in three regions: Vancouver Island, Okanagan and Metro Vancouver. Each regional initiative has its own vision and road map. A commonality is the desire to change the way that land is developed and water is used.

Lessons learned are being shared. Intra-regional and inter-regional collaboration is resulting in consistent approaches to green infrastructure policies and practices.

Regional Team Approach

The *Regional Team Approach* is an outcome of 'convening for action'; and is evolving into a provincial 'practitioners network'. Local governments are demonstrating that the practitioner culture can be changed through collaboration, partnerships and alignment.

The term 'regional team approach' is resonating. Insertion of the word **team** in 'regional approach' has had a profound impact on how practitioners view their world. Team implies there is personal commitment; it also suggests there is a game plan and a coachable context. The regional team approach is proving to be a powerful motivator.



Mission Possible

By bringing together local government implementers in neutral forums, this enables the implementers to collaborate as regional teams. Their action-oriented focus will result in 'how to do it' examples that help decision-makers visualize what policy goals look like on the ground."

Because examples inform policy decisions by elected representatives, provide them with commonsense examples that make it easy for them to move from awareness to action.

Connecting people to the landscape is important. The mission for the Regional Team Approach is to change the *land ethic* for the better.



Convening for Action in British Columbia



Integrated Rainwater Management Planning: Apply a Knowledge-Based Approach to Focus on Solutions and Outcomes

Beyond the Guidebook 2010: Implementing a New Culture for
Watershed Protection and Restoration in British Columbia

Convening for Action in BC:

Visualize What We Want Our Regions to Look Like in 50 years

Create a Legacy: *Settlement Change in Balance with Ecology*

1. *Influence choices by individuals and organizations*
2. *Use the term "sustainability" as a lens for considering approaches that influence choices*

Integrated Rainwater Management Planning: Apply a Knowledge-Based Approach to Focus on Solutions and Outcomes

Water Bucket Web Story #3 in the ISMP Course Correction Series

Preface

*This article is the third in a series that is designed to inform local governments and others about **Integrated Stormwater Management Plans** (ISMPs): what they are; how local governments can do more with less; and how local governments can ensure ISMPs are outcome-oriented.*

*This series is adapted from case study experience presented in **Beyond the Guidebook 2010: Implementing a New Culture for Watershed Protection and Restoration in British Columbia**, released in June. This guidance document sets the stage for an “ISMP Course Correction”.*

As part of the “ISMP Course Correction”, the time has come to describe truly integrated plans as “IRMPs” to reflect the paradigm-shift to landscape-based ‘RAINwater’ from pipe-and-convey ‘stormwater’.

A holistic IRMP is a potentially powerful tool to achieve a vision for ‘green’ infrastructure, one that protects stream health, fish habitat and fish; and one that anticipates climate change. Local governments now have a decade of precedent-setting experience from which to extract lessons learned.

This Story #3 clarifies the objectives in making the change to IRMP from ISMP, introduces the knowledge-based approach to making decisions, and highlights the ‘learnings’ by those who are demonstrating leadership in establishing outcome-oriented precedents for watershed protection through green infrastructure: Establish the vision, set the target, and then implement.

**The ‘regional team approach’
is founded on partnerships and collaboration;
and seeks to align actions at three scales –
provincial, regional and local.**



“Everyone needs to agree on expectations and how all the players will work together, and after that each community can reach its goals in its own way.”

Eric Bonham
CAVI Leadership Team

Integrated Rainwater Management Planning: Apply a Knowledge-Based Approach to Focus on Solutions and Outcomes

Water Bucket Web Story #3 in the ISMP Course Correction Series

Regional Team Context for IRMPs

The purpose in publishing the “ISMP Course Correction Series” is to draw attention to lessons learned, and insights gained, by local government leaders who have ISMP and/or related, relevant experience. The spotlight is on aligning efforts in the local government setting to implement effective green infrastructure. Thus, the objectives in correcting from ISMPs to IRMPs are three-fold:

- Re-focus on stream health outcomes
- Utilize land use regulatory tools
- Build-in resilience to adapt to climate change

Sharing experience and pooling limited resources will enable local governments to ‘do more with less’, especially if they embrace the ‘regional team approach’ to doing business differently.

Form a Regional Team

Under the *Regional Team Approach*, all the players set their sights on the *common good* and challenge the old barriers of jurisdictional interests. To achieve the *common good*, this ultimately requires bringing together:

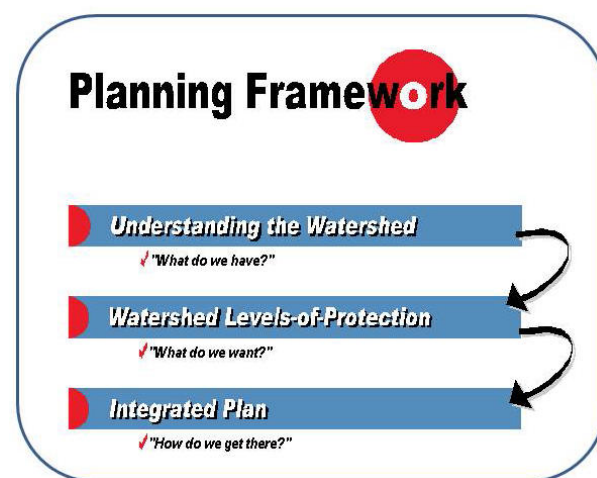
- ☑ **The Province** - those who provide the legislative framework;
- ☑ **Local government** - those who plan and regulate land use;
- ☑ **Developers** - those who build;
- ☑ **Stewardship sector** – those who advocate conservation of resources;
- ☑ **Agricultural sector** – those who grow food; and
- ☑ **Academia** - those who provide research.

Framing the Challenge for Local Government:

“How we can simultaneously work together as staff within a municipality and as a region, AND externally with developers and other private sector players, to ensure we implement sustainable approaches to the urban fabric.”

Apply a Knowledge-Based Approach

A decade ago, the Regional District of Nanaimo (RDN) partnered with the Province to develop case study content for **Stormwater Planning: A Guidebook for British Columbia**. The RDN contributed a *Knowledge-Based Approach* to setting watershed priorities. This pilot application, incorporated as Chapter 5 in the Guidebook, resulted in a pragmatic methodology that focuses on outcomes, by getting the right people together.



A decade later, the *Bowker Creek Blueprint* in the Capital Regional District (CRD) has demonstrated the effectiveness of the approach. The RDN and CRD experiences show that when the right people with the right knowledge are involved in a collaborative process, a knowledge-based approach to watershed protection and restoration will be both time-efficient and cost-effective.

Roundtable Process: The reach-by-reach process that defines the Bowker Blueprint is an application of what the Guidebook describes as an *Inter-Disciplinary Roundtable Process*. The objective in bringing together the planning, engineering and ecological perspectives in the same room is to make initial decisions based on informed judgement.

Figure 1, reproduced from the Guidebook, conceptualizes inputs and outcomes that define the *Inter-Disciplinary Roundtable Process*. It need not be, and should not be, a lengthy process.

**Integrated Rainwater Management Planning:
Apply a Knowledge-Based Approach to Focus on Solutions and Outcomes**

Water Bucket Web Story #3 in the ISMP Course Correction Series

Knowledge-Based Approach

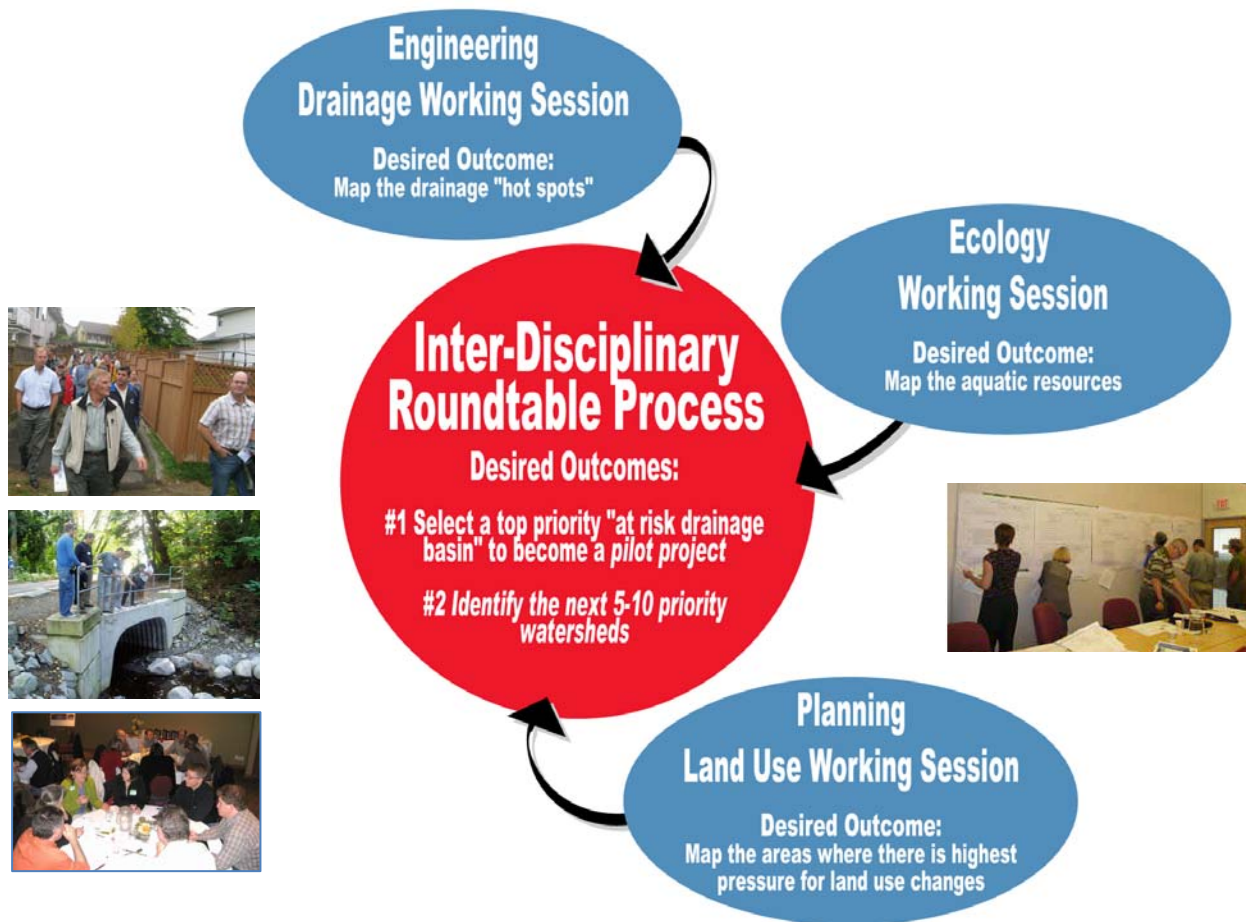


Figure 1

Source: *Stormwater Planning: A Guidebook for British Columbia*, 2002

Integrated Rainwater Management Planning: Apply a Knowledge-Based Approach to Focus on Solutions and Outcomes

Water Bucket Web Story #3 in the ISMP Course Correction Series

Bowker Creek Blueprint

The *Bowker Creek Urban Watershed Renewal Initiative* (BCI) demonstrates how a 'regional team approach' to urban watershed restoration has been applied in the Capital Region. The players driving the BCI have brought their shared vision to fruition through development of the **Bowker Creek Blueprint** (Figure 2 on next page).

The *Bowker Creek Forum*, held in February 2010, was a celebration of the Blueprint. In addition, the Forum provided an opportunity for Georgia Basin inter-regional sharing.

From 'Collective Indifference' to 'Design with Nature'

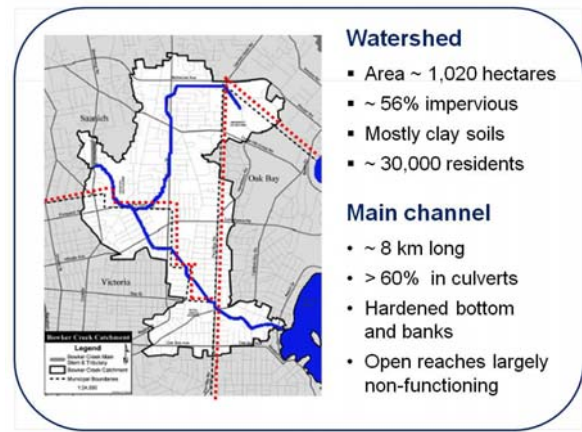
"Why did we choose Bowker Creek when it is a rather degraded watershed," Jody Watson asked rhetorically at the Bowker Creek Forum. "The answer is that we saw it as an opportunity. If we could make it right in Bowker Creek, we could make it right anywhere."

Jody Watson, Harbours and Watersheds Coordinator with the Capital Regional District, is BCI Chair. Her storytelling at the Bowker Creek Forum provided context for the 'collective indifference' that had characterized the urbanization of Bowker Creek for more than a century; and for the 'design with nature' ethic that is now driving watershed restoration.

A defining moment in the Bowker Creek process was the decision to 'let go of the ISMP Template'.

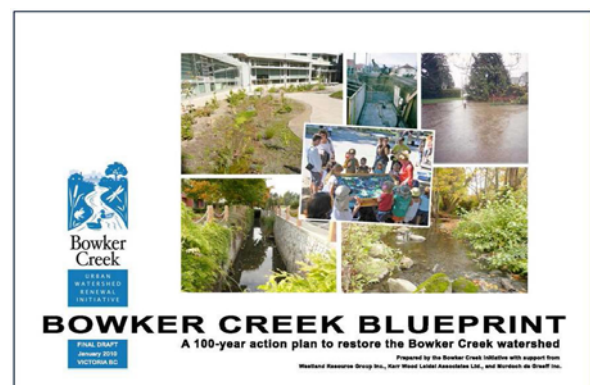
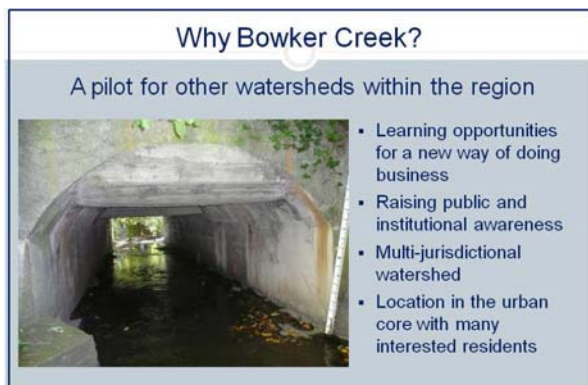
About the Bowker Creek Initiative

The *Bowker Creek Initiative* is a unique multi-jurisdictional effort. Four local governments (CRD, City of Victoria, District of Saanich and City of Oak Bay), community groups, post-secondary institutions and private citizens are collaborating to improve the health of Bowker Creek and its watershed.



100-Year Action Plan: The BCI developed the Blueprint as a 100-Year Action Plan to guide watershed and creek corridor restoration as the various neighbourhoods redevelop over time.

Because change can be slow in the urban environment, implementation will take decades. Having an action plan in place will ensure that positive changes can happen incrementally, and that opportunities for major improvements can be realized as they arise.



Integrated Rainwater Management Planning: Apply a Knowledge-Based Approach to Focus on Solutions and Outcomes

Water Bucket Web Story #3 in the ISMP Course Correction Series

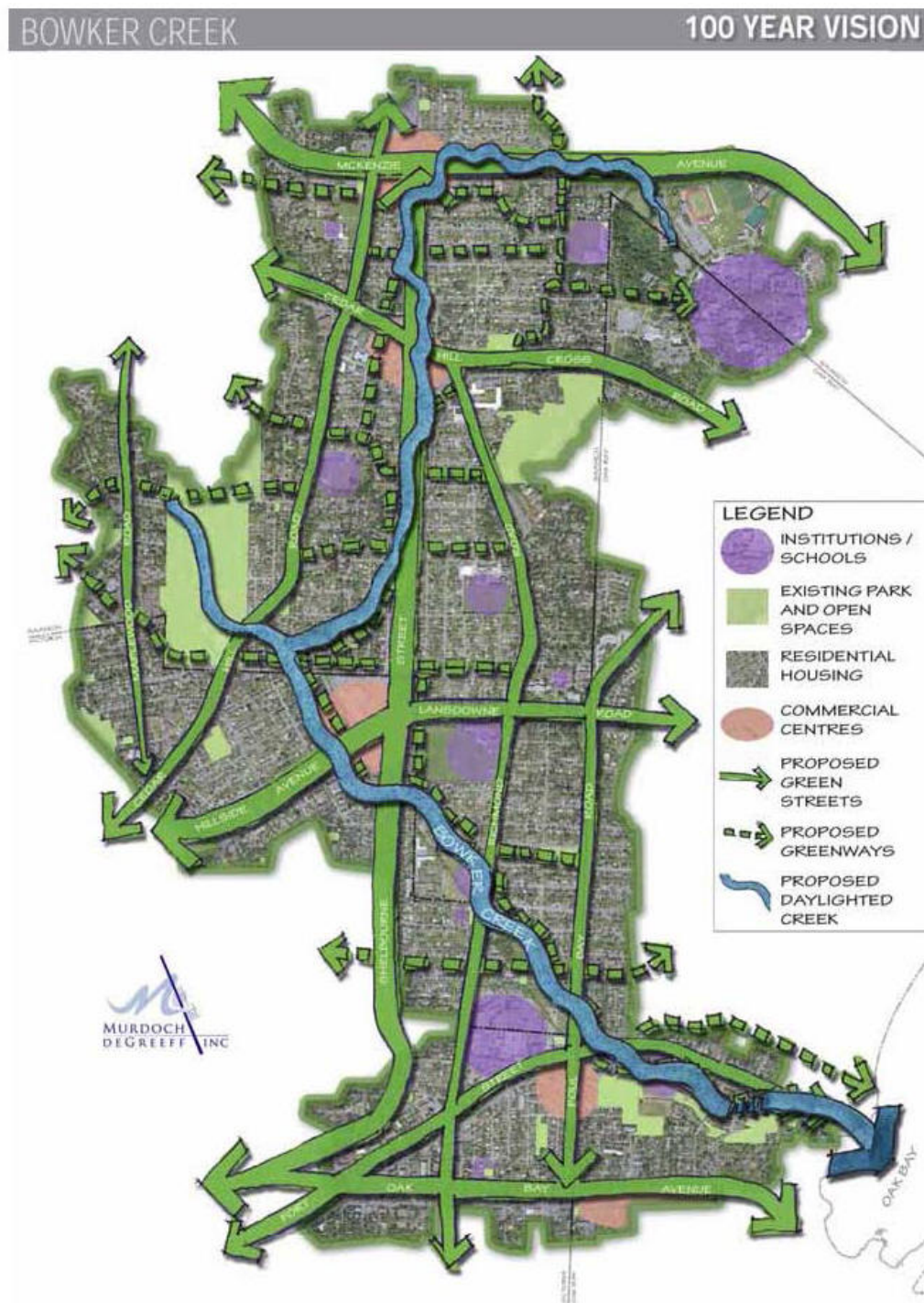


Figure 2

Integrated Rainwater Management Planning: Apply a Knowledge-Based Approach to Focus on Solutions and Outcomes

Water Bucket Web Story #3 in the ISMP Course Correction Series

Knowledge-Based Approach Works

Once the Bowker Creek regional team 'let go' of the *ISMP Template*, they applied a 'knowledge-based approach' to watershed restoration. The experience was transformational; and laid the foundation for Blueprint development.



Why the Blueprint: “In 2003, the three member municipalities and the CRD Board approved the *Bowker Creek Stormwater Management Plan*”, Jody Watson told the Forum. “While this guidance document gave strategic direction, it did not provide municipal planners with the level of detail they need to effectively review individual development applications in the context of either a greenway or creek day-lighting strategy.”

“This really stymied municipal staff. So we concluded that we needed to get those necessary details down on paper. The meat of the Blueprint lies in the appendices. We wanted to keep the document easy to read, and easy to get through.”

“To help municipal staff make decisions, there were all sorts of things that we had to incorporate. To meet as many of the goals and objectives of the 2003 Management Plan as possible, we had to integrate a lot of information.”

Inter-Disciplinary Roundtable: The knowledge-based approach meant that the regional team convened as an inter-disciplinary roundtable to synthesize their individual areas of knowledge. “Drainage, land use, environmental and social information was compiled and assessed in an holistic way that enabled the members of the team to apply their collective best judgment, reach-by reach,” emphasized Jody Watson.

What Are the Lessons Learned?

The BCI Steering Committee has identified seven distinguishing characteristics ('key messages') that capture the essence of lessons learned and experience gained. These are:

1. Community Values Drive BCI and Blueprint
2. Coordinator Role is Crucial
3. Outreach – A Powerful Tool
4. Commit to the Vision
5. Integrate Watershed and Creek Actions.
6. Regional Alignment Starts With a Regional Team Approach
7. Blueprint Allows for Climate Change

There is a story behind each 'learning', and the Steering Committee is interested in sharing those stories. These stories are central to the founding of the BCI and the development of the Blueprint.

Community Values Drive BCI and Blueprint:

The partnership has enabled community groups and municipal staffs to coalesce around a shared vision for watershed restoration over time.

Coordinator Role is Crucial: In a five year review of the BCI, all partners agreed that having a dedicated part-time coordinator was the most important factor contributing to successes to date.

Outreach – A Powerful Tool: Community groups and individuals have taken ownership and responsibility for “telling the Bowker story”.

Commit to the Vision: The US versus THEM way-of-thinking changed to the WE paradigm. The players around the table realized that they can help each other.

Integrate Watershed and Creek Actions:

Community representatives and municipal staffs must be hands-on in developing a watershed restoration plan. Involvement is what creates the sense of ownership.

Blueprint Allows for Climate Change: Good urban watershed management overlaps with climate change action – e.g. riparian restoration.

Integrated Rainwater Management Planning: Apply a Knowledge-Based Approach to Focus on Solutions and Outcomes


Water Bucket Web Story #3 in the ISMP Course Correction Series

Implementation: Municipal Perspectives

At the Bowker Forum, Adriane Pollard (District of Saanich) elaborated on what should be simple and what might be difficult to implement. Then Anne Topp (District of Saanich) dealt with issues, opportunities and key factors for success. They set the scene for Steven Fifield (Manager of Underground Utilities, City of Victoria) to describe the Trent Street Rain Gardens. This is an example of what implementation looks like on the ground.

What Should Be Simple, What Might Be Difficult: "Council has been recently engaged by the Bowker Creek Initiative: a bus tour of the watershed; an open house for councillors to be introduced to the Draft Blueprint; a public open house; and presentations to Council committees. There is generally a good feeling and understanding of the work being done," stated Adriane Pollard, Manager of Environmental Services.



What should be simple...

- Council's acceptance of the blueprint
- Annual financial support for the BCI
- Maintaining the community momentum of raising awareness and taking initiative
- Supporting/completing the Blueprint's top ten creek corridor key actions
- Most of the Blueprint's watershed actions

What might be difficult...

- Moving from the old business-as-usual/existing infrastructure to LID and rainwater management
- Day-lighting on private property
- Competing for acquisition dollars
- Recognizing the gains made over time
- Keeping track of actions & setting future priorities

Issues: "The big elephant in the room is always money. Municipalities have lots of competing interests for spending money; lots of projects to keep staff busy; and finite financial resources. We are all challenged to do more with less and get it done," stated Anne Topp, Manager of Community Planning.



Opportunities: "We all have heard the quote 'if you don't know where you are going, it doesn't matter what road you take'. With completion of the Blueprint, the Bowker Creek Initiative knows where it wants to go and now we need to find the road to get there. Integrating with and using other plans to advance the Blueprint will be ongoing. An example is the proposed **Shelbourne Corridor Action Plan**. Integration of the Blueprint with that plan will strengthen both."

Key Factors for Success: "I do not remember who came up with the idea to make this a 100-year plan but I think the group agreement to use the idea was **brilliant**. There are some big ideas in the plan and a 100-year time frame might take the sting out for the people thinking about all the little issues that could impact implementation.... This approach gives us time. This plan is not just about water. It is about how this community wants to live and connect to the environment."

"Back to money... the 100-year approach should help us. We don't have to do the \$20 million, \$40 million ISMP approach. Keeping the pieces small and creating bite-sized pieces should allow the slow and steady approach."

"The reach-by-reach approach is *marketing friendly* for citizen and council. They can focus on the piece they know best and relate to the picture. The actions are *descriptive and understandable* without the overkill of the background technical work that supports the plan."

Trent Street Rain Gardens: "You have to be committed and you have to think long-term. Location wise, Trent Street was a great opportunity. This type of green feature is the future of good watershed management in Bowker Creek and other watersheds in our region," concluded Steven Fifield.



Integrated Rainwater Management Planning: Apply a Knowledge-Based Approach to Focus on Solutions and Outcomes

Water Bucket Web Story #3 in the ISMP Course Correction Series

Surrey ISMPs Establish Watershed Objectives

Similar to the Bowker Creek Initiative, the City of Surrey's approach to ISMP development is guided by a philosophy that is outcome-oriented. The City's approach is framed by this mind-map:

- What do we have?
- What do we want?
- How do we put this into action?

Furthermore, Surrey has moved beyond pilot projects. ISMPs are establishing watershed objectives and targets to achieve a watershed vision for getting green infrastructure right: *"Once we know what we want our watersheds and neighbourhoods to look like, the next step is to decide what the tools are that will get us there."*

Water Balance Model Building Blocks

One such tool is the Water Balance Model (WBM). Surrey experience has informed WBM development. The WBM evaluates performance targets for rainfall capture. The *Stream Health Methodology* embedded in the WBM evolved through three successive case studies: East Clayton, South Newton and Fergus Creek.

A decade ago, the East Clayton Sustainable Community was an early application of performance targets at a neighbourhood scale. Also, and most importantly the analysis combined mass balance and flow duration to test the achievability of performance targets.

But it was the South Newton case study five years ago when the methodology really came together in terms of how to integrate the mass balance and stream erosion analyses. Until then, they were separate analyses.

The experience gained in East Clayton and South Newton was then applied in the Fergus Creek ISMP to develop the *Stream Health Methodology*. This methodology is a function of flow duration, and hence stream erosion. It enables correlation of green infrastructure effectiveness (in reducing runoff volume) with stream health.

Community Outreach in Surrey

"We are not just 'greening' urban drainage, we are facilitating a stewardship ethic through ongoing celebration of innovation", states Carrie Baron, Drainage & Environment Manager.

Celebration of East Clayton Success: "To sustain the early momentum, each successive homeowner in East Clayton needs to understand the WHY behind the on-site drainage retention philosophy. Each year, high school students deliver a brochure door-to-door. We also tell our story at Community Day events and at mall displays."



"It is all about continual education. Slowly we are changing the mind-set. It makes a difference that the educational approach is endorsed by Council through Sustainable Surrey,"

Transformation of Robson Park: "In North Surrey, we are really excited about the impact that Robson Creek day-lighting has had in mobilizing the community in a 70-year old neighbourhood. Park transformation started with Engineering and Parks collaborating on a joint project. We then involved the neighbourhood, streamkeepers and local school to create a shared vision. The community now has a great new park with educational water features."

"The locals say they have never seen so many people use the revitalized Robson Park. This success story shows that things don't have to stay the same; over time we can bring value back into a neighbourhood."

Connecting with High School Students: "We are working with the Surrey School District to help teachers incorporate local environmental examples into course curricula. We are targeting high school students. We make the material relevant to their interests."

"This is a long-term commitment. We believe we are successful even if we only reach 2 students out of 30. It will catch on over time."

Integrated Rainwater Management Planning: Apply a Knowledge-Based Approach to Focus on Solutions and Outcomes

Water Bucket Web Story #3 in the ISMP Course Correction Series

Vision for District-Wide IRMP in North Vancouver

The District of North Vancouver has a bold vision to systematically retrofit individual properties as they come up for redevelopment. The catalyst for pending action is the 'death by a thousand cuts' consequences for 'watershed health' that result when current zoning is applied to small lot redevelopment. The District's outcome-oriented approach seeks to address the link between single family zoned lands and the health of the municipality's streams.

Through its Official Community Plan Update, the District is advancing a vision for preserving and/or restoring the rainfall absorption capacity of its watersheds, one property at a time, over time. Much like the vision for the *Bowker Creek Blueprint*, watershed landscape restoration will take a multi-decade commitment.

Risk to Watershed Health

To draw attention to the urgent need for action on single-family residential properties, the District has created a set of images to illustrate why and how watershed health is at risk. Using the Mackay Creek watershed as a case study, the District analyzed trends and examined specific properties to quantify the implications of an expanding house footprint. The data show that:

- The watershed is at maximum build-out; and is undergoing redevelopment as the older housing stock is replaced.
- Within 20 years, 10 percent of the existing single family lots in the Mackay watershed could be redeveloped.
- Redevelopment could result in a **25% increase** in impervious area and **10% increase** in annual runoff volume.

Figure 3 illustrates what happens when a single family property is redeveloped: the impervious area approximately doubles and accounts for over half the property; and the tree canopy coverage is reduced from three-quarters of the property to zero.

Strategy for Watershed Landscape Restoration

"We have observed the experience of other municipalities that have applied the *ISMP Template*. They have spent a lot of money to get reports that say spend more money. The District simply cannot afford to go down a path that leads to engineering solutions that are unaffordable and unrealistic," states the District's Richard Boase.



"We suspect the ISMP process as originally defined is beyond the District's financial ability to undertake and implement. Yet we are faced with a looming 2014 deadline to have work done to meet our regulatory commitment under the Metro Vancouver region's *Integrated Liquid Waste & Resource Management Plan*."

"We need an outcome-oriented alternative to the ISMP Template, and we hope we have it with our proposed *Watershed Landscape Restoration Strategy*. This could be our District-Wide Integrated Rainwater Management Plan (IRMP), and there is an opportunity to implement it through the current OCP Update.

Ecological Integrity: "A key message is that the focus of this landscape-based strategy is on restoring ecological integrity. We are not talking about changing floor space ratios. We are just saying people have to pay closer attention to the surficial treatment of our watershed landscape."

"Restoring and protecting our watersheds starts by changing the land ethic. Since this is about behaviour, we have to build from the ground up. This can be achieved by a holistic strategy that is keyed to *cumulative and complementary steps*. We start with the individual property and we move out from there."

"The District hopes to develop a set of performance-based solutions, representing multiple options for landowners, to restore ecological integrity. An absorbent topsoil layer and tree canopy protection are examples of the fundamental building blocks and options we are pursuing to achieve our watershed restoration vision," concludes Richard Boase.

Integrated Rainwater Management Planning: Apply a Knowledge-Based Approach to Focus on Solutions and Outcomes

Water Bucket Web Story #3 in the ISMP Course Correction Series

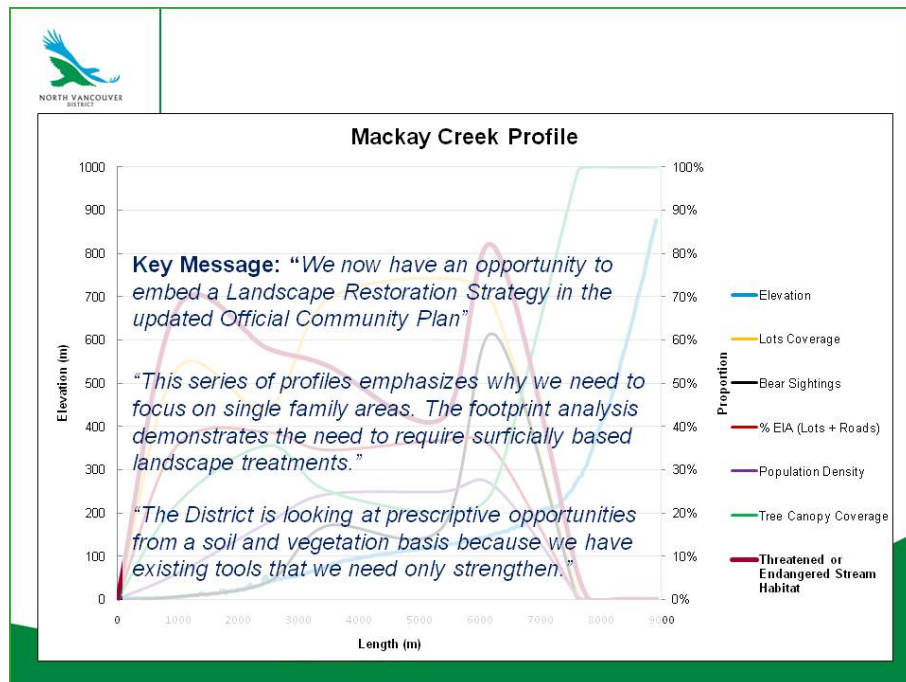
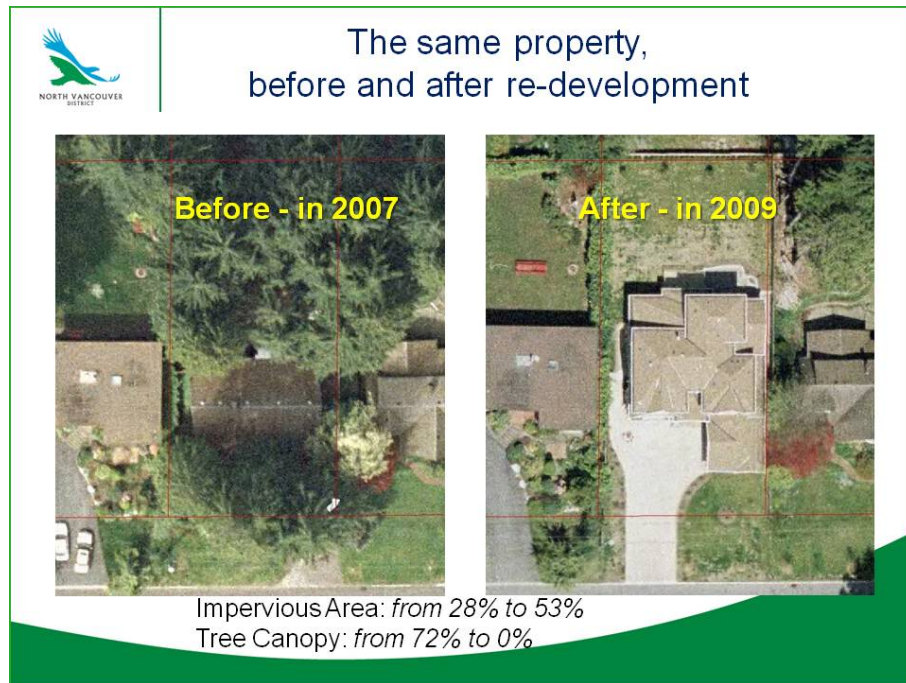


Figure 3 – Turning a Risk into An Opportunity in
the District of North Vancouver

Integrated Rainwater Management Planning: Apply a Knowledge-Based Approach to Focus on Solutions and Outcomes

Water Bucket Web Story #3 in the ISMP Course Correction Series

Guiding Principles for IRMP Development

The Bowker Creek Initiative, City of Surrey and District of North Vancouver are all demonstrating leadership in establishing provincial precedents for outcome-oriented approaches to watershed protection through green infrastructure: *Establish the vision, set the target, and then implement*

Success Will Follow When...

A key message in *Beyond the Guidebook 2010* is that success will follow in the local government setting when all the players are motivated by these guiding principles:

1. Choose to be enabled.
2. Establish high expectations.
3. Embrace a shared vision.
4. Collaborate as a 'regional team'.
5. Align and integrate efforts.
6. Celebrate innovation.
7. Connect with community advocates.
8. Develop local government talent.
9. Promote shared responsibility.
10. Change the land ethic for the better.

A second key message is that community representatives and municipal staffs must be hands-on when collaborating to develop a shared 'watershed vision' and implementation plan.



Convening for Action

The *Bowker Creek Forum* drew attention to five watershed-based initiatives in five regional districts within the Georgia Basin. All five are keyed to integration of water and land planning. Each one has established a provincial precedent.

Vancouver Island and Metro Vancouver are learning from each other, and are moving in the same direction. Commencing in 2006, 'convening for action' program elements implemented on Vancouver Island have built on Metro Vancouver approaches and precedents.

Subsequently, Vancouver Island experience has informed and influenced elements of the *Metro Vancouver Integrated Liquid Waste & Resource Management Plan*, in particular those actions that will advance a 'regional team approach'.

2009 Green Infrastructure Forum in Surrey: An example of intra-regional sharing and learning is the 'Surrey Forum'. Figure 4 captures the vision of the partner organizations and desired outcomes for the Surrey Forum: start a dialogue between policy-makers and project implementers; get green infrastructure built right; be a catalyst for additional regional forums; and champion a consistent region-wide approach to integration.

Looking Ahead

The first three installments in this series have established the context for embracing the *regional team approach* and making the change to IRMP from ISMP:

- re-focus on outcomes;
- capitalize on opportunities; and
- apply a knowledge-based approach.

Next, the spotlight shifts to *sustainable service delivery* and *doing more with less* in the last two segments.

An increasing local government infrastructure deficit means that there will be even stiffer competition for available funding. Thus, there is an incentive for local governments to demonstrate how a regional team approach and innovation will meet the goals of *Living Water Smart*.

Integrated Rainwater Management Planning: Apply a Knowledge-Based Approach to Focus on Solutions and Outcomes

Water Bucket Web Story #3 in the ISMP Course Correction Series

Convening for Action in Metro Vancouver Getting Green Infrastructure Built

Moving Beyond Pilot Projects to a Broader Watersheds Objectives Approach

THE CHALLENGE: *How do we simultaneously work together as staff within a municipality and as a region AND externally with developers and other private sector players, to ensure we implement sustainable approaches to development?*

"The best laid plans...."

The problem is the gap between design and build
How to ensure that the best laid plans come to fruition?
How to get all the actors singing from the same song sheet?

To get to the big picture, it starts with the smallest pieces. For this reason, the Surrey Forum is advancing a regional team approach that aligns local actions with provincial policy goals as articulated in the **Living Water Smart** and the **Green Communities** initiatives. Making this happen requires partnerships, collaboration, innovation and integration.

We see the Forum as providing an opportunity to generate positive energy in the region. In particular, the Forum will inform the actions identified in the rainwater/stormwater component of Metro Vancouver's updated **Liquid Waste Management Plan**. We believe this is where the opportunity for implementing a regional team approach resides.

We anticipate that the Forum sharing sessions will show that there are solutions if people talk to each other about what they each could do differently. This will help all parties collaborate to more effectively fulfil their piece of the sustainable development puzzle.

Once we know what we want our watersheds and neighbourhoods to look like, the next step is to decide *what the tools are that will get us there*. All of us ...whether we are regulators, developers or designersneed to understand and care about the goal if we are to create the future that we all want.

Ted van der Gulik, P.Eng.
(BC Ministry of Agriculture & Lands)
Chair, Inter-Governmental Partnership

Vincent Lalonde, P.Eng.
(City of Surrey)
General Manager, Engineering

Raymond Fung, P.Eng.
(District of West Vancouver)
Chair, Green Infrastructure Partnership



Figure 4

Convening for Action in British Columbia



Integrated Rainwater Management Planning: Move to a Levels-of-Protection Approach to Sustainable Service Delivery

Beyond the Guidebook 2010: Implementing a New Culture for
Watershed Protection and Restoration in British Columbia

Convening for Action in BC:

Visualize What We Want Our Regions to Look Like in 50 years

Create a Legacy: Settlement Change in Balance with Ecology

1. *Influence choices by individuals and organizations*
2. *Use the term "sustainability" as a lens for considering approaches that influence choices*

Integrated Rainwater Management Planning: Move to a Levels-of-Protection Approach to Sustainable Service Delivery

Water Bucket Web Story #4 in the ISMP Course Correction Series

Preface

*This article is the fourth in a series that is designed to inform local governments and others about the paradigm-shift to landscape-based 'RAINwater' from pipe-and-convey 'STORMwater', and what this means for **Integrated Stormwater Management Plans (ISMPs)**.*

*This series is adapted from case study experience presented in **Beyond the Guidebook 2010: Implementing a New Culture for Watershed Protection and Restoration in British Columbia**, released in June. This guidance document sets the stage for an "ISMP Course Correction".*

*The 'course correction' starts with characterizing truly integrated plans as 'IRMPs' (**Integrated RAINwater Management Plans**). A holistic IRMP is a potentially powerful tool to achieve a vision for 'green' infrastructure, one that protects stream health, fish habitat and fish; and anticipates climate change.*

The first three installments in the series established the context for embracing a 'regional team approach' and making the change to IRMP from ISMP: Now, the spotlight shifts to Asset Management as a pathway to re-focus on desired watershed outcomes.

*This Story #4 introduces the 'infrastructure deficit' as a driver for the 'course correction', connects the dots to the Green Communities Initiative, views the **Levels-of-Service** concept through the land use planning and environmental lenses, and provides three examples to illustrate how local government leaders are moving forward with Sustainable Service Delivery.*



BRITISH COLUMBIA
The Best Place on Earth



Grants Foster 'Sustainable Service Delivery'

*"The reality of an increasing local government **infrastructure deficit** means that there will be even stiffer competition for available funding.*

*As a result, there is a greater incentive for local governments to demonstrate how their **innovation and integration** will be effective in meeting the program goals of both the **Green Communities Initiative** and **Living Water Smart**."*



Glen Brown, Executive Director
Ministry of Community, Sport & Cultural Development
September 2009

Integrated Rainwater Management Planning: Move to a Levels-of-Protection Approach to Sustainable Service Delivery

Water Bucket Web Story #4 in the ISMP Course Correction Series

Sustainable Service Delivery Context for IRMPs

The time is now right to make the change to IRMP from ISMP. To facilitate the paradigm-shift, the first three installments in this series have addressed three themes:

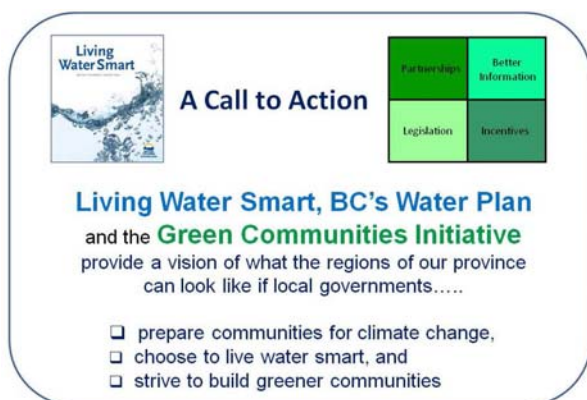
- re-focus on outcomes;
- capitalize on opportunities; and
- apply a knowledge-based approach.

Next, the ‘course correction’ spotlight shifts to the opportunity that IRMPs (ISMPs) can create for communities to also advance a vision for *Sustainable Service Delivery*. This term describes a new way of thinking about infrastructure needs and how to pay for those needs over time.

Infrastructure Deficit

A driver for the ISMP course correction is the *infrastructure deficit*. Simply put, this means the cost to renew or replace aging infrastructure exceeds taxpayer ability to pay the cost. This *unfunded liability* is increasing year after year.

Going forward, this means that there will be even stiffer competition for available funding; and there will be even greater emphasis on getting the most value out of every dollar spent. This reality provides an additional incentive to demonstrate how a ‘regional team approach’ and ‘doing business differently’ will meet the goals of *Living Water Smart* and the *Green Communities Initiative* to create the future desired by all.



A Call to Action

Living Water Smart, BC's Water Plan and the **Green Communities Initiative** provide a vision of what the regions of our province can look like if local governments.....

- ☐ prepare communities for climate change,
- ☐ choose to live water smart, and
- ☐ strive to build greener communities

Preparing Communities for Change

Living Water Smart presents the vision, and the Green Communities Initiative provides enabling tools to achieve the vision. They must be viewed as an integrated package. They are preparing communities for change: *start with effective green infrastructure and truly restore the urban fabric.*

Asset Management: The 45 actions and targets in Living Water Smart encourage ‘green choices’ that will be cumulative in creating liveable communities and protecting watershed health; and furthermore, will foster an holistic approach to *infrastructure asset management*.

“A life-cycle assessment helps us see the costs and benefits over the lifetime of the good or service. Developments and redevelopments that consider water efficiency, stream health, and smart growth principles will deliver better environmental health and economic returns.” (p.68)

GOVERNMENT POSITION: Government will develop new protocols for capital planning that will look at the life-cycle costs and benefits of buildings, goods, and services.” (p.69)

To achieve this desired outcome, the Province is both enabling and supporting the efforts of the *Local Government Asset Management Working Group* and *Asset Management BC*. (www.assetmanagementbc.ca).

The definition of Asset Management is holistic (see below) and provides financial context for the ‘ISMP course correction’. It emphasizes integration and connects the dots to ecology.



What is Asset Management?
(as defined by the National Asset Management Working Group)

Integrated approach involving planning, engineering and finance to effectively manage existing and new municipal infrastructure in a sustainable manner to maximize benefits, reduce risk and provide satisfactory levels of service to the community user in an environmentally and ecologically responsible manner.

Integrated Rainwater Management Planning: Move to a Levels-of-Protection Approach to Sustainable Service Delivery

Water Bucket Web Story #4 in the ISMP Course Correction Series

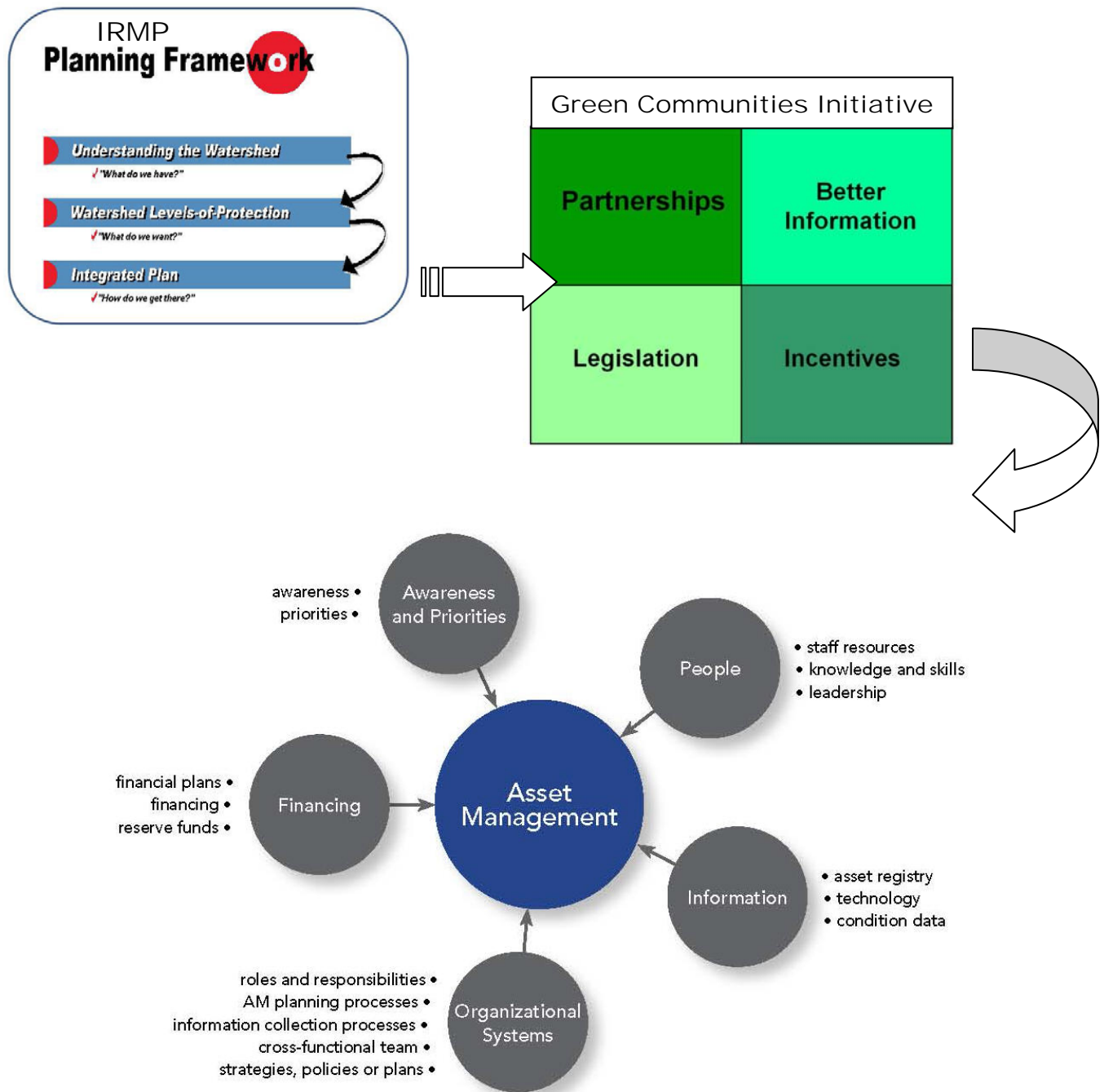


Figure 1 - Green Communities Initiative provides a Framework for 'Sustainable Service Delivery'

Integrated Rainwater Management Planning: Move to a Levels-of-Protection Approach to Sustainable Service Delivery

Water Bucket Web Story #4 in the ISMP Course Correction Series

Green Communities Initiative

The relationship between the provincial and local levels of government in British Columbia has evolved differently than in other provinces, with a history of recognizing and appreciating local autonomy. As a result, BC local government is among the most autonomous in Canada.

Historically, the Province has enabled local governments by providing policy and legal tools in response to requests from local government. This means the onus is on local government to take the initiative. The bottom-up approach enables communities to reach consensus on the need for action, and then align efforts to take action.

Framework for Action

Comprehensive in scope, the Green Communities Initiative is designed to help local governments create *integrated communities*. The initiative has four elements that complement and support Living Water Smart, namely:

- partnerships
- better information
- incentives
- legislation

Figure 1 conceptualizes the linkages and/or relationships between the IRMP mind-map, the four elements of the Green Communities Initiative, and the five core capacity areas of Asset Management. **Note:** by definition, *Levels-of-Protection* is a sub-set of *Level-of-Service*.

Incentives for Innovation and Integration:

“Provincial grant programs provide local governments with incentives for implementation of new ways of doing business. Grant programs will be leveraged to achieve both provincial and local government goals and objectives, such as Living Water Smart targets,” states Glen Brown, Executive Director with the Local Government Infrastructure and Finance Division.

“On the implementation side, it is how those incentives feed back into the planning side. More and more, good implementation relies on good planning.”

Implementing the Course Correction

Not all streams and watersheds are the same; nor should all targets and initiatives be established with a standardized prescription. It is equally important that the process of watershed evaluation and of creating a vision of the future watershed consider the effects of land use change, the environment, public needs and affordability.

Each watershed may have a different future, have different publicly accepted visions for the future, and require a very different set of management objectives from other watersheds. Each watershed is unique and the IRMP process should address the uniqueness; and provide recommendations and strategies that recognize those unique features.

Watershed Vision First, Engineering Second:

An outcome-oriented IRMP can provide a clear picture of how local governments can apply land use planning tools to create a future desired by all. Deferring detailed drainage engineering analyses until later would allow the desired future (vision) for watershed protection to be established with less cost.

A prime example is the pipe-by-pipe evaluation of drainage capacity. Is this really needed as part of an IRMP where the environmental impacts result from small events, and drainage systems are sized for the extreme? Some potential costs are associated with fixing existing capacity problems, applying new drainage standards to increase the level of protection, and to allow for potential impacts resulting from a changing climate. When assessing the acceptability of new standards, two questions must be asked:

1. *Is there sufficient will and funding to accomplish this?*
2. *Does this question require an answer as part of the IRMP process?*

If application of new standards would trigger an unaffordable upgrade of the existing drainage infrastructure system to provide greater capacity, one can question whether there is a value in the analysis; and ask whether different criteria might result in a lower cost solution. A shift to a **‘Level-of-Service’** approach would be a more rational way of providing community infrastructure with acceptable levels of service and cost. In short, attribute the costs to the infrastructure, not to the vision of the watershed and not to reduction of impacts to the stream.

Integrated Rainwater Management Planning: Move to a Levels-of-Protection Approach to Sustainable Service Delivery

Water Bucket Web Story #4 in the ISMP Course Correction Series

Sustainable Service Delivery

The 'ISMP course correction' provides the opportunity to develop a truly integrated Asset Management Strategy that views the watershed and the strategy through an environmental lens. This requires a paradigm-shift by practitioners.

In the past, the expectation by many was that the ISMP would identify infrastructure shortfalls and provide a capital plan for future implementation. This represents a divergence from what was originally envisioned a decade ago: *create a vision of a future watershed complete with intact environmental values, healthy streams and abundant fishery resources*. The linkage to asset management is a way to re-focus on outcomes.

Going forward it will be necessary to resolve the apparent divergence in expectations as a way to correctly attribute future costs to sustaining the environment versus infrastructure renewal. The distinction in direction and approach for the IRMP process, or 'ISMP course correction', may not be immediately obvious to some but it is critical to the future application and acceptance of IRMPs (ISMPs) by all stakeholders.

Asset Management

Asset management usually commences after something is built; and this historical way-of-thinking is reflected in the following definitions:

- **Asset:** A physical component that has value, enables services to be provided, and has an economic life of greater than 12 months.
- **Level of Service:** The defined standard for the provision of a particular service. Reflects quality, quantity, reliability, responsiveness, environmental acceptability and cost.
- **Life-Cycle Cost:** The total cost of an asset throughout its life including costs for planning, design, construction, acquisition, operation, maintenance, rehabilitation, and disposal.

The challenge is to think about what asset management entails BEFORE the asset is built. This paradigm-shift starts with land use planning and determining what services can be provided sustainably, both fiscally and ecologically.

Level-of-Service Approach

"Everyone needs to be thinking in terms of life-cycle costs, especially future recapitalization of the investment. This is not normally considered in traditional infrastructure decision-making," states Stan Westby, Chair of the Local Government Asset Management Working Group and Powell River CAO.

Avoid Building an Unfunded Liability: "While developers and new home purchasers pay the initial capital cost of municipal infrastructure under either greenfield or redevelopment scenarios, it is local government that assumes responsibility for the long-term cost associated with operation, maintenance and replacement of infrastructure assets."

"A rule-of-thumb is that the initial capital cost is about 20% of the life-cycle cost. The other 80% represents an unfunded liability. This underscores the vital necessity of making a sound front-end infrastructure investment decision. Don't build a liability!"

Establish a Sustainable Level: "When you think about it some more, you realize we really should be talking about *level-of-service*. This term is the integrator for everything," continues Glen Brown.

"What level does a community wish to provide, and what level can it afford. Everyone will have to make level-of-service choices. Thus, a guiding principle for an IRMP could be framed this way: *Establish the level-of-service that is sustainable to protect watershed health, and then work backwards to determine how to achieve that level of protection.*"

Transition into the Future: The framework presented in Table 2 (after page 6) envisions a level-of-service approach to setting watershed-specific runoff targets. It identifies the questions that need to be asked when evaluating the acceptability of targets.

From the stream health perspective, appropriate and effective green infrastructure is a way to increase the level-of-service. Expressed another way, green infrastructure that restores the rainfall absorption capacity of the watershed landscape will increase the level of ecological protection.

The process of establishing an acceptable '**Level-of-Service**' will require local governments to review, examine, and justify the existing standards and how to transition into the future where costs must be balanced against public needs and expectations.

Integrated Rainwater Management Planning: Move to a Levels-of-Protection Approach to Sustainable Service Delivery

Water Bucket Web Story #4 in the ISMP Course Correction Series

Integration of Land Use and Asset Management Planning

The link between asset management and the protection of a community's natural resources is emerging as an important piece in Sustainable Service Delivery – in particular, water-centric green infrastructure that maintains or restores the natural water balance has value because it also protects aquatic habitat and hence stream health.

To make the link, think in terms of the 'Level-of-Service' an urban tree canopy provides for rainfall interception. As trees grow, the interception capability increases; and the 'infrastructure value' of this natural asset appreciates. This contrasts with pipe assets that depreciate over time.

So, with respect to rainwater management, an IRMP is a vehicle for local government to strategically connect the dots between land use planning, development standards and asset management. Furthermore, a local government could make a very strong case for having a higher level of service - with 'assets' that appreciate, not depreciate, at a lower life-cycle cost. This is a strong argument to support what the District of North Vancouver, as profiled in Story #3, wishes to accomplish via its proposed strategy for watershed landscape restoration over time.

An Integrated Approach

"Land use planning in British Columbia may be significantly improved when integrated with asset management

planning in local governments," writes Kim Fowler, Director of Sustainability for the City of Victoria (and a member of the Local Government Asset Management Working Group) in her recent paper titled "Local Government Land Use and Asset Management Planning in BC: Proposed Sustainable Service Improvements".



Land Use Planning is the Key Determinant: "If the necessity, goal, and best practice of asset management is an integrated approach involving planning, finance, engineering and operations effectively managing existing and new infrastructure, then how should this occur? How do local governments ensure the full service life is reached and have mechanisms to enable their replacement? And why are planners the least knowledgeable of the local government professionals about asset management when land use planning is the key determinant for infrastructure demand and servicing?"

"The legislative requirements for integration of land use planning and asset management, including financial management, are already mandated. So why is this not commonly happening?"

Need for Local Governments to Be Nimble, Collaborative and Integrated: "The accelerating pace of change in our communities will continue, requiring local governments to become much more nimble, collaborative and integrated with a long-term focus. Each local government may determine where to start based on its particular circumstances, whether that be an asset management policy or plan, corporate strategic plan or long-term financial plan but the longer these plans are delayed, the more drastic the following measures will be in order to survive financially:

- Lowering of service levels;
- Reduction or elimination of some assets;
- Challenging risk acceptance limits;
- More partnerships, particularly with private capital investment; and
- More user pay charges."

"The change is here, and it is accelerating. Local governments have an opportunity to adapt and mitigate these changes and improve resiliency of our communities within existing legislative authority and current best practices," concludes Kim Fowler.

Integrated Rainwater Management Planning: Move to a Levels-of-Protection Approach to Sustainable Service Delivery

Water Bucket Web Story #4 in the ISMP Course Correction Series

How to Move Forward

Municipalities such as the District of Saanich, City of Surrey and District of West Vancouver are demonstrating how to tackle the infrastructure deficit. Each has a vision for *Sustainable Service Delivery*, a long-term implementation plan, and an incremental approach to getting there.

District of Saanich

Saanich Council has committed to an overall plan to increase capital spending to sustainable levels by the year 2019. This includes capital spending for water, sewer, drainage, transportation, park and facility infrastructure.



The Saanich success story is told in an interview with Mayor Frank Leonard. This was published as a feature article in the Asset Management Newsletter in December 2010. Written by Glen Brown, the article follows this page.

“Our approach was not to describe the problem as if the ‘sky was falling’ or the result as poor management because it wasn’t, but rather as a problem that needed to be addressed and could be addressed over a longer period of time. The solution was an incremental, long term approach that would be achieved over a 15 to 19 year period,” Mayor Leonard states.

City of Surrey

Before the 1970s, comprehensive urban drainage planning was a rarity in British Columbia. By the early 1970s, however, drainage had emerged as an issue in the suburban areas. The City of Surrey was an early leader in embracing and/or pioneering new approaches.

Water resource management is a longstanding City priority. Now in its fifth decade of continuous implementation experience, the City continues to evolve and adapt a watershed-based approach that incorporates lessons learned in getting green infrastructure right.

Capitalize on Opportunities: Surrey’s vision is that watershed and development planning will be done together, and this will result in a 100-year strategy for sustainable infrastructure renewal that is directly linked to watershed health. Priority projects are rolled into a 10-Year Capital Plan. The guiding philosophy for project selection is to look at the ‘big picture’ for each watershed and capitalize on opportunities to leverage the beneficial impact of individual projects.

Because redevelopment is a 100-year process, there will be opportunities to incrementally make a difference when projects such as Robson Creek day-lighting can achieve multiple outcomes. This is similar to the approach taken in the Capital Regional District with the *Bowker Creek Blueprint* (refer to Story #3 regarding both).

District of West Vancouver

West Vancouver has enthusiastically adopted a coordinated approach to managing its assets. Early results related to the utilities infrastructure identified a shortfall in the resources required now, and a larger shortfall in the future. A key component to addressing this issue has been the effort to communicate with District stakeholders, primarily local residents and businesses. During 2010, staff attended numerous meetings with resident associations and also held public meetings. With the 2011 budget, District Council has embarked on a path towards responsible long term infrastructure management by adopting a 5-year plan to increase the utility capital budgets. Staff will continue to develop and fine-tune the asset management program to ensure the additional resources are implemented both effectively and timely.

The District currently has one ISMP completed and two ongoing with more to be completed in the future. Two of the key deliverables from an ISMP are recommendations for potential new infrastructure, and a prioritized list of work related to capacity enhancements for existing infrastructure. As such, these planning studies and the overall management of the infrastructure are intrinsically linked. The information developed in these studies is being used by the District both to assist in land use planning as well as in capital rehabilitation programming.

Recommendations for additional infrastructure are being reviewed with an eye towards reducing future liabilities, and opportunities for coordination of future rehabilitation work are being explored. Over time, this effort is anticipated to increase the long term sustainability of the District’s assets and integration throughout the municipality.



Asset Management Newsletter

FIRST EDITION – FALL 2010 ISSUE



Feature Article: Interview with Saanich Mayor Frank Leonard

By Glen Brown



Saanich Council has committed to an overall plan to increase capital spending to sustainable levels by the year 2019. This includes capital spending for water, sewer, drainage, transportation, park and facility infrastructure.

Mayor Frank Leonard

Glen Brown - At a recent Local Government Leadership Academy (LGLA) workshop, you mentioned the continued need to approach local government financial/funding requirements at 2 levels; (1) Continue to dialogue with senior government to improve local government funding opportunities (grants, alternative taxation approaches, etc), and (2) Look internally to your own organization to improve financial sustainability and service delivery. Saanich appears to be very proactive when it comes to looking internally and supporting best management practices like asset management. Can you provide an overview on your approach to Saanich's infrastructure replacement plan?

Mayor Leonard – *In the late 90's, staff had done considerable work in assessing our infrastructure assets, the services we provide and the long term costs associated*

with service delivery in order to identify our infrastructure gap or deficit. My concern with this information was how we presented this to the public. It was important to identify the needs, but at the same time maintain the public's trust and inspire confidence that their tax dollars are being spent wisely. So our approach was not to describe the problem as if the 'sky was falling' or the result as poor management because it wasn't, but rather as a problem that needed to be addressed and could be addressed over a longer period of time. As identified in the Saanich Infrastructure Summary¹, the solution was an incremental, long term approach that would be achieved over a 15 to 19 year period. Effective public consultation, as well as political consensus, allowed us to proceed with a yearly property tax increase of 0.75% to support the capital replacement of water, sewer, drainage, transportation and park infrastructure. This is now embedded as policy into the Saanich Strategic Plan and after 10 years of implementation, Saanich is very close to achieving our goal of sustainable levels of funding for these assets.

Glen Brown - At the LGLA, you effectively and simply articulated the importance of public awareness, consultation and education. To recall your words, "Never advance a solution to an issue prior to having public awareness of the issue, or the solution may become the issue." How did you proceed with public awareness/education with respect to the tax increase Saanich implemented to support the financial sustainability of your critical infrastructure (roads, water, sewer, drainage, parks and facilities)?

¹ http://www.saanich.ca/services/pdf/infrastructure_summary.pdf

Mayor Leonard – *It is important to look at this as a problem solving exercise. In the public sector/political governance sector, you have to take a different approach than that of small business or a big corporation. My approach is, when the solution will require time and/or money, you should follow 2 simple rules; (1) You can't solve a problem in advance of public awareness, and (2) You can't propose a solution in advance of political debate. Saanich spent considerable effort in ensuring all communications described the infrastructure gap- this included communications through the financial plan, the AGM, the Strategic Plan and all speeches. We focused on identifying what we need to spend, what we are spending, and how we will increase spending/taxation to solve the problem. It was also important how the information was provided – it was clearly understood that a 'Chicken Little' approach would not be effective with the public as we needed to ensure that the public maintained or built confidence in the job we were doing. This, over a period of a few years, addressed rule #1. During the same time, we also focused on rule #2, debating the issue at council, at all candidate's meetings and at community meetings. The implementation of the plan only began when there was a political consensus and public awareness.*

Glen Brown - At a high level, asset management is really about looking at the services being delivered by a community, then balancing the public's expectation on 'level of service' with the public's expectation/ ability/ desire to pay for the service. Of course, there are certain services where the level of service is entirely or partially controlled by legislation, code, or bylaw. Do you think the average taxpayer is able to make this connection? Is there something collectively we (local governments, provincial government, LG associations such as BC Asset Management) can do to improve public awareness?

Mayor Leonard - *In Saanich, I believe we have been successful in educating and making the public aware of this connection. Saanich has been able to do this through a number of different communication approaches. Through a more scientific approach, we have Public Opinion Polls, as part of our Strategic Plan. This provides input on the public's understanding of the issues and allows us to do some benchmarking. A less scientific approach for me occurs at tax notice time. There is a letter from the Mayor which is enclosed with the tax notices, highlighting the changes to taxes, what we need to do, what we are going to do, and the cost of doing it. We log the calls and complaints that come in, and over the last 10 years, complaints have steadily declined, to the present, where the majority of the complaints are focussed on assessment concerns, rather than how Saanich is utilizing the tax revenues to provide*

services. I believe our public, and certainly our community groups and associations, are well educated and aware of the issues affecting service delivery in Saanich. So for other local governments, I see the need for public awareness as a key to being successful. Any opportunity to support smaller communities, with resource and capacity issues, can only be seen as a benefit.

Glen Brown - It is recognized that a significant challenge in managing service delivery and infrastructure is the time differences that exist between an elected official's 'life cycle' (3 years), a financial plan's 'life cycle' (5 years) and infrastructure's 'life-cycle' (25 + years). What do you consider your biggest challenge with respect to ensuring that the services provided to the taxpayers of Saanich are sustainable?

Mayor Leonard - *The biggest challenge is something that Saanich has been successful in addressing – having stability with our Council. Saanich has had no radical shifts in the make-up of Council for the last decade. This does not mean that all members of Council agree on every issue before them, but it does eliminate Council being fearful of not being able to achieve their goals in a short time frame (3 years). It allows us to address issues with more confidence and look at issues with the long term view. A major key to our success has been the consequence of this stable culture, which also provides lots of political experience.*

Glen Brown - Are there any other thoughts, or words of wisdom, you would like to share with the BC asset management community?

Mayor Leonard - *It is important to understand that in the political world, change must occur incrementally. A good example of this is what Saanich has done with bike lanes. The key was starting small, but at the same time, taking the initial first step. Initially, getting something small in the budget for bike lane capital improvements provided the opportunity to continually grow the program. Politically, if we started big, it would never have been approved by Council. Now, with the budget line for bike lanes growing annually, we have an excellent biking network. We have taken the same approach with our critical infrastructure. While we have a long term plan, it was the incremental approach, year by year, that allowed us get to where we are today. In 2000, it looked overwhelming, in 2010, we are now close to reaching our goal of having our critical infrastructure services being sustainable. It all started with small, incremental steps. As I like to say, 'in Saanich, we specialize in happy endings!'*

Integrated Rainwater Management Planning: Move to a Levels-of-Protection Approach to Sustainable Service Delivery

Table 2 (brought forward from Chapter 7 in 'Beyond the Guidebook 2010')

Developing Outcome-Oriented Watershed Plans: Framework for Moving from Planning to Action

Action	Level of Commitment
Complete and implement integrated rainwater/stormwater management plans that are affordable and effective in protecting or restoring Watershed Health	<ul style="list-style-type: none"> Local governments, in collaboration with senior governments, develop Integrated Plans that enable implementation of integrated strategies for greening the built environment; and include establishing watershed-specific runoff targets (for managing the complete rainfall spectrum) that make sense, meet multiple objectives, are affordable, and result in net environmental benefits at a watershed scale. <p><i>(Note: To date, "integrated drainage plans" have typically been called "ISMPs" pursuant to the nomenclature established in Chapter 9 of the 2002 Guidebook. The time has come to describe truly integrated plans as "IRMPs" to reflect the paradigm-shift from pipe-and-convey 'stormwater' to landscape-based 'RAINwater')</i></p>
	<ul style="list-style-type: none"> Local governments, in collaboration with senior governments, establish watershed targets that are characteristic of actual conditions in watersheds, recognizing that there will be different strategies for already developed versus partially developed watersheds.
	<ul style="list-style-type: none"> Local governments, in collaboration with senior governments, evaluate the acceptability of watershed-specific runoff targets on the basis of an evaluation framed by these three questions: <ol style="list-style-type: none"> 1. What target will achieve the watershed health objective? 2. What needs to be done to make the target achievable? 3. Do the solutions meet the test of affordability and multiple objectives?
	<ul style="list-style-type: none"> Local governments, in collaboration with senior governments, implement green infrastructure solutions that result in effective rainfall management at the site, catchment and watershed scales.
Embed "IRMP" landscape-based strategies in neighbourhood concept plans	<ul style="list-style-type: none"> Local governments develop rainwater/stormwater and land use plans through an inter-departmental process that is collaborative and integrated. Local governments provide guidance as to how watershed-specific targets can be met at the development scale.

Source: **Commentary on Effective Municipal Rainwater/Stormwater Management and Green Infrastructure to Achieve Watershed Health**, April 2008

Released jointly by the Green Infrastructure Partnership and the Inter-Governmental Partnership in conjunction with the consultation process for Metro Vancouver's *Integrated Liquid Waste & Resource Management Plan*

The Commentary is accompanied by a paper titled *Beyond the Guidebook: Establish Watershed-Specific Runoff Capture Performance Targets*, released at the 2008 Water Balance Model Partners Forum.

Convening for Action in British Columbia



Integrated Rainwater Management Planning: Apply Inexpensive Screening Tools and 'Do More with Less'

Beyond the Guidebook 2010: Implementing a New Culture for
Watershed Protection and Restoration in British Columbia

Convening for Action in BC:

Visualize What We Want Our Regions to Look Like in 50 years

Create a Legacy: Settlement Change in Balance with Ecology

1. *Influence choices by individuals and organizations*
2. *Use the term "sustainability" as a lens for considering approaches that influence choices*

Integrated Rainwater Management Planning: Apply Inexpensive Screening Tools and 'Do More with Less'

Water Bucket Web Story #5 in the ISMP Course Correction Series

Preface

*This article is the fifth and last instalment in a series that is designed to inform local governments and others about the paradigm-shift to landscape-based 'RAINwater' from pipe-and-convey 'STORMwater', and what this means for **Integrated Stormwater Management Plans (ISMPs)**.*

*This series is adapted from case study experience presented in **Beyond the Guidebook 2010: Implementing a New Culture for Watershed Protection and Restoration in British Columbia**, released in June. This guidance document sets the stage for an "ISMP Course Correction".*

*The 'course correction' starts with characterizing truly integrated plans as 'IRMPs' (**Integrated RAINwater Management Plans**). A holistic IRMP is a potentially powerful tool to achieve a vision for 'green' infrastructure, one that protects stream health, fish habitat and fish; and anticipates climate change.*

This Story #5 is built around City of Surrey case study experience. Now in its fifth decade of continuous implementation experience, the City continues to evolve and adapt a watershed-based approach that incorporates lessons learned in getting green infrastructure right. The Surrey guiding philosophy is captured by these key messages:

- *Each watershed area is unique, and its needs are unique.*
- *Integrate drainage planning with land use, environment, parks, and other infrastructure/community needs.*
- *Model the drainage system after there is some concept of overall direction – do not model just to model.*
- *Have short, medium and long term goals / visions for the ISMP area with integration of opportunities.*

The notion of 'shared responsibility' is a foundation piece for collaboration, alignment and integration. When these are in place, innovation will follow. Shared responsibility is a unifying theme for two case studies described in this Story #5. They illustrate the value of looking outside the pipe.

Shared Responsibility



"Once we know what we want our watersheds and neighbourhoods to look like, the next step is to decide *what the tools are that will get us there*. All of us.... whether we are regulators, developers or designers.... need to understand and care about the goal if we are to create the future that we all want."

Vincent Lalonde, General Manager,
Engineering Division, City of Surrey
February 2009

Integrated Rainwater Management Planning: Apply Inexpensive Screening Tools and 'Do More with Less'

Water Bucket Web Story #5 in the ISMP Course Correction Series

Shared Responsibility Context for an IRMP / ISMP

An increasing local government infrastructure deficit means that there will be even more competition for available funding. Thus, a driver for the *ISMP Course Correction* is to demonstrate how to 'do more with less' by placing emphasis on what really matters. This objective can be achieved through a front-end effort that connects with the community and gets the watershed vision right. Then create a blueprint to implement green infrastructure that truly restores the urban fabric. Recognize that implementation will be a multi-decade commitment.

What We Have Learned After a Decade

A decade ago, local governments were venturing into uncharted waters when undertaking ISMPs. The experience of the City of Surrey and other pioneer leaders serves as a guide for the *ISMP Course Correction*.

Key Message #1: Resist the temptation to launch directly into computer modeling and engineering analyses. Step back. Ask this question: *What do we want this watershed to look like in 50 years?*

A decade ago, we knew we had to do business differently in order to protect and/or restore watershed health. A decade later, we have the tools and experience to make a difference.

Key Message #2: Align efforts. Integrate with land use and development processes that drive the built form. A watershed vision is about the look-and-feel of the watershed landscape.

Remember: A decade ago, the genesis for ISMPs was a desire to integrate community, engineering, planning and environmental perspectives. Why: *To develop truly 'integrated' solutions.*

An IRMP / ISMP is a potentially powerful tool. It can influence the other processes for the better. It can provide the blueprint for integrated action.

Key Message #3: Everyone has a role to play. This goes to the heart of *Shared Responsibility*.

Shared Responsibility Matrix

The Matrix presented in Figure 1 was an outcome of the *2009 Metro Vancouver Water Balance Model Forum*. Hosted by the City of Surrey, the Forum was a first step in advancing a regional team approach that aligns municipal actions in the Metro Vancouver region with provincial green infrastructure goals.

Shared responsibility is a foundation piece for collaboration, alignment and integration. The Matrix was developed as an holistic way to encourage players with different perspectives to talk candidly with each other about implementation of green infrastructure goals.

There are (integrated) solutions to be found if all parties in the community development process simply talk to each other about how they could all work together more effectively, using law reform or other process changes as tools.

Figure 1 uses on-site rainwater management to illustrate application of the Matrix.

Focus on Values and Actions

Experience has demonstrated that five ingredients will be in the mix when practitioners in a local government setting undertake to develop outcome-oriented plans. The participants will have to collaborate to:

1. Define the problem
2. Declare the community's values
3. Select and apply the right tools
4. Wrestle with the solutions
5. Monitor and adapt in the future

When the use of screening tools is coupled with the front-end effort to create a *Watershed Vision*, this stretches a local government dollar further, regardless of IRMP / ISMP scope.

The first step is always defining the vision for the future. Then there must be a balance in defining the components of that vision. Since ISMPs were intended as a vehicle to integrate community, engineering, planning and environmental perspectives, the integration process must provide a balanced effort in detailing each of these diverse components of the IRMP / ISMP when creating a vision for the future.

Integrated Rainwater Management Planning: Apply Inexpensive Screening Tools and 'Do More with Less'

Water Bucket Web Story #5 in the ISMP Course Correction Series

Responsibility Matrix		
Goal	Party	Tool
<ul style="list-style-type: none"> ▪ Objectives ▪ Situations ▪ Responsibilities 	<ul style="list-style-type: none"> ▪ Regional staff and elected representatives ▪ Municipal staff and elected representatives ▪ Private actors (developers, builders, homeowners, stewardship groups, universities and colleges, etc.) 	<ul style="list-style-type: none"> ▪ Law ▪ Bylaw ▪ Policy ▪ Procedure ▪ Incentive ▪ Penalty ▪ Security ▪ Budget
Desired or Required Outcomes	Relevant Staff or Other Actors	Instruments for Action

Application of Responsibility Matrix		
Desired Outcome	Relevant Actors	Instruments for Action
Onsite Rainwater Management	1. Regional Government 2. Municipal Government 3. Developer 4. Builder	1. Living Water Smart policy direction; Regional liquid resource management plan 2. Regional targets translated to site level action using Water Balance Model tool and Land Use Planning, site standards; linkage made between watershed plan and development practices/neighbourhood plan; Official Community Plan direction; visible political leadership on issue 3. Bylaws require a) onsite rainwater management facilities b) security for performance c) regular inspection and reporting re: maintenance (e.g. on business license renewal); departments charged and funded to inspect 4. Communication, contractual provisions, occupancy permit

Figure 1 – Shared Responsibility Matrix

Integrated Rainwater Management Planning: Apply Inexpensive Screening Tools and 'Do More with Less'

Water Bucket Web Story #5 in the ISMP Course Correction Series

Level-of-Service Case Study: Surrey's Bon Accord West Plan

The fourth instalment in this *ISMP Course Correction Series* introduced the level-of-service approach in the context of 'Sustainable Service Delivery'. To illustrate application of the approach, this page presents a City of Surrey case study, namely: *Bon Accord West Functional and Remediation Plan*, completed in 2002.



Context for Plan Development in 2002

Context for the Bon Accord West project is provided by the direction given by Surrey at the start of the study. The City identified a need to achieve a cost-effective drainage system – that is, one that addressed the needs of the existing community for flood protection and drainage while being fiscally responsible.

This is a situation that many municipalities face today: an existing system, some problem areas, and limited funding available for system upgrades. Hence, the City's approach to the engineering analysis is particularly relevant. This case study demonstrates an important aspect of how to 'do more with less' by taking a fresh look at the basis for accepted practice.

A Pragmatic Approach: A majority of the system had been operating without serious problems for many years. Furthermore, for the vast majority of the time, the system capacity is only partially utilized for conveyance. These two reality-checks provided the basis for advancing the following as guiding principles:

- When there is minimal risk of flooding, it is better to maintain the existing system than to construct a new system that will comply with the most recent drainage design criteria.

- Where a drainage system is in place, the design of additions or modifications must be tempered with pragmatism.

Application of these guiding principles led to this objective: *Provide a uniform Level-of-Service (LOS) for both drainage and flood prevention, one that is based on a uniform area discharge rate (i.e. in this case, 30 Lps per hectare).* This rule provided an equal level of service or access to the drainage system for all properties within the watershed. The level of service was shown to be adequate through the history of the watershed with some identified minor exceptions.

The fundamental question then became: "Do we accept this proven level of drainage service or do we upgrade the system to the latest drainage criteria?" In answering this question, due consideration was given to the associated costs and benefits.

Lesson Learned

A lesson learned was that the *Level-of-Service (LOS)* approach serves as an inexpensive screening tool. It provides relevant information for capital planning; and it does this without the need for detailed and expensive computer simulation of the drainage system. The process establishes existing system capacity and then identifies those parts that do not meet this standard. These are prioritized and entered into the municipality's capital plan.

The Bon Accord West case study developed a cost comparison to demonstrate the benefits of a pragmatic approach that strives to 'do more with less':

System Upgrade Cost Comparison	
Upgrade Level-of-Service to:	Total Cost
Reduce Immediate Flooding Risks	\$0.8M
Provide System Capacity = 30 Lps/ha	\$1.4M
Provide System Capacity = 5-yr rating	\$2.2M
Provide System Capacity = 100-yr rating	\$5.0M

By basing key infrastructure upgrades on this approach, the City determined that it could then look at upgrading other components on a normal asset renewal basis.

Integrated Rainwater Management Planning: Apply Inexpensive Screening Tools and 'Do More with Less'

Water Bucket Web Story #5 in the ISMP Course Correction Series

Outcome-Oriented Terms of Reference for an IRMP / ISMP

Figure 2 below is brought forward from **Stormwater Planning: A Guidebook for British Columbia**. The purpose is to draw attention to the distinction between *outcome*-oriented and *output*-oriented. This distinction is material and goes to the heart of 'do more with less'.

Vision First, Engineering Second

An *outcome*-oriented IRMP can provide a clear picture of how local governments can apply land use planning tools to create a future watershed condition desired by all. This approach contrasts with an *output*-oriented approach where the primary emphasis is on data collection, computer modeling and pipe analyses; and results in a 'glorified' Master Drainage Plan.

Figure 2 illustrates the stepping stones along a pathway to reach consensus on a shared watershed vision (i.e. 'this is what we all want'). On page 9-9 of the Guidebook, it cautions that:

"All too often, technical people go directly to Step #4 (Collect Data) without first asking what they are trying to accomplish, and why. As a result, they solve the wrong problem, and then wonder why elected officials and/or the public take issue with the proposed solution."

Example of An Holistic Approach

Table 1 is adapted from recent City of Surrey experience in commissioning seven ISMPs. The Surrey philosophy is captured colloquially by the four bullets listed below. This mind-map establishes expectations:

- Put on your boots and go for a walkabout
- After that, integrate stakeholder views
- Think through what you are proposing
- Then, and only then, do your modeling

Table 1 reinforces the 'vision first, engineering second' mantra. It also provides a starting point for those who wish to undertake an holistic and balanced IRMP / ISMP.

Four-Stage Process: Surrey has evolved a four-stage process for ISMP development. These stages correspond to:

1. What do we have?
2. What do we want?
3. How do we get there?
4. Prove it.

Throughout the ISMP process there is an emphasis on the balance between the needs and costs associated with the engineering, the environment, the planning and the public parts of the ISMP process..



Figure 2

Seven Step Process for Developing & Implementing an ISMP

Integrated Rainwater Management Planning: Apply Inexpensive Screening Tools and 'Do More with Less'

Water Bucket Web Story #5 in the ISMP Course Correction Series

Table 1 – City of Surrey Framework for an Holistic and Balanced ISMP

<p>The Process</p> <p>Stage 1 – “What Do We Have?” Stage 2 – “What Do We Want?” Stage 3 – “How Do We Put This Into Action?” Stage 4 – “How Do We Stay On Target?”</p>
<p>Balanced Goals</p> <p>As part of defining “what we want”, the City identified these balanced goals:</p> <ul style="list-style-type: none">▪ Protect and enhance the overall health and natural resources of the watershed;▪ Promote participation from all stakeholders to achieve a common future vision of the watershed;▪ Minimize risk of life and property damages associated with flooding and provide strategies to attenuate peak flows;▪ Protect and enhance watercourses and aquatic life;▪ Prevent pollution and maintain / improve water quality;▪ Prepare an inventory of watercourses and wildlife for the watershed;▪ Protect the environment, wildlife, and habitat corridors;▪ Identify areas of existing and future agricultural, residential, commercial, and recreational land uses;▪ Develop a cost effective and enforceable implementation plan; and,▪ Establish a monitoring and assessment strategy to ensure goals are achieved, maintained, and enforced.
<p>Scope of the Four Stages</p> <p>Stage 1: "What Do We Have?" Review Existing Information and Data Collection</p> <ol style="list-style-type: none">1. A review of existing information;2. Watershed field reconnaissance and data collection;3. Definition of hydrologic and hydraulic conditions; and4. A public open house to begin dialogue on community objectives.

Integrated Rainwater Management Planning: Apply Inexpensive Screening Tools and 'Do More with Less'

Water Bucket Web Story #5 in the ISMP Course Correction Series

Stage 2: "What Do We Want?" Vision for Future Development

To achieve the goals, the requirements for developing a vision encompass:

7. Innovative Low Impact Development (LID) techniques and stormwater Best Management Practices (BMP) to mitigate against impacts to the lowland areas, reduce runoff volume through source controls, decrease stream velocity, protect water quality, provide erosion protection, and maintain baseflows to streams;
8. Sound, proven numerical hydrologic and hydraulic modelling techniques;
9. Hydrogeological assessments;
10. Environmental assessments for habitat protection and enhancement;
11. Land use plans which will be developed to identify future land use types, stream setbacks, wildlife corridors, potential pond locations and any other opportunities or constraints for development; and
12. Stakeholder involvement through a public open house meeting.

Stage 3: "How do we put this into action?" Implementation Plan, Funding Strategies, and Enforcement Strategies

13. A long-range capital works plan;
14. Cost analysis;
15. A review of the existing Design Criteria to assess which are appropriate for this ISMP and what should be added or modified;
16. A project approvals procedure;
17. A funding strategy;
18. A by-law enforcement strategy which identifies existing and missing bylaws; and
19. A list of action items with time scales.

Stage 4: "How do we stay on target?" Monitoring and Assessment Plan

20. Creation of a strategic plan for monitoring and assessing that includes an explanation of why data needs to be collected and assessed in a monitoring program and how to interpret the collected data.
21. Provision of a summary of key performance indicators (KPIs), both qualitative and quantitative with a sensitivity analysis to indicate the relative magnitude of flexibility that resides in each identified KPI.
22. Summary of the type, duration, and frequency of monitoring associated with each KPI.

Integrated Rainwater Management Planning: Apply Inexpensive Screening Tools and 'Do More with Less'

Water Bucket Web Story #5 in the ISMP Course Correction Series

A Closing Perspective on the 'ISMP Course Correction'

Looking back, the primary driver for the ISMP approach was the 'salmon crisis' of the 1990s. This crisis focussed attention on the relationship between land development practices and stream degradation. When Richard Horner and Chris May published their landmark Puget Sound research findings in 1997, they triggered a paradigm-shift that influenced the British Columbia vision for interdisciplinary ISMPs.

This historical context is important to understand. It provides a basis for assessing an ISMP: *Does it create a vision of a future watershed complete with intact environmental values, healthy streams and abundant fishery resources?*

Although it is not characterized as an ISMP, the outcome-oriented *Bowker Creek Blueprint* in the Capital Region has established a benchmark for judging whether an ISMP meets the above test.

Landscape-Based Approach

A decade ago, a Metro Vancouver working group and provincial staff collaborated to produce a discussion paper titled *A Watershed/Landscape-Based Approach to Community Planning*, released in 2002. This document was the genesis for 'water-centric planning'; and served as a blueprint for integration of the engineering, planning and environmental perspectives to achieve a truly interdisciplinary ISMP approach and outcome.



"The premise underpinning the landscape-based approach is that resource, land use and community design decisions will be made with an eye towards their potential impact on watershed health," stated Erik Karlsen, the principal author.

Hence, a purpose of this *ISMP Course Correction Series* is to remind and/or inform those in the local government setting as to WHY local governments originally committed to an ISMP journey. Then attention can shift to HOW to achieve the vision.

How to Achieve a Watershed Vision

Collaboration is the key to achieving a shared vision. The Guidebook includes a brief history of how modern stormwater management in British Columbia has evolved. Regarding collaboration, Page 1-12 concludes with this observation: "*Local governments in British Columbia are changing. Those that are changing are providing models for others to adapt and further evolve.*"

As the stories in **Beyond the Guidebook 2010** demonstrate, there are many champions in local government who are providing leadership and making a difference to achieve a watershed vision. The City of Surrey and the Capital Region stand out because of their sustained commitment. Their accomplishments serve as models. This is the reason both are featured in the *ISMP Course Correction Series*.

Much like the Bowker Creek Blueprint, ISMP success in Surrey relies in large part on the strength of the relationship between City staff and community advocates. One cannot delegate creation of a vision. Furthermore, it takes a process to reach consensus on the actions that will protect watershed health.

An IRMP / ISMP is a potentially powerful tool because it does enable a local government to address HOW to achieve a watershed vision. The process can achieve integration of perspectives. The IRMP / ISMP process will then influence the land use and development processes that drive the look-and-feel of the watershed landscape.



Federal funding provided by Infrastructure Canada has made it possible for communities across BC to build, rehabilitate and maintain much needed infrastructure across the province. For example, Memorial Hall in Harrison Hot Springs had deteriorated considerably and recently required a major overhaul. Renovations are now complete thanks in part to a \$200,000 contribution from the Infrastructure Stimulus Fund. As a result, the community is better positioned to sustain its long-standing role as a tourist destination of choice.



Memorial Hall, Harrison Hot Springs, BC

The Infrastructure Stimulus Fund provided an additional \$237,500 investment to help extend Lansdowne Road in Richmond. This project has made it easier for people to use the Canada Line as a direct link to Vancouver and the rest of the lower mainland and included the addition of high-efficiency lighting, geothermal sidewalk warmers to reduce annual maintenance costs and bike lanes to increase safety for cyclists.



Lansdowne Road Extension, Richmond, BC

Infrastructure Canada is investing in these projects and thousands of others like them with our partners across the country. By making these funds available, the Department is helping to keep the economy rolling, contributing to a cleaner environment and making our cities better places to live and work.

Integrated Rainwater Management: Move to a Levels-of-Service Approach to Sustainable Service Delivery

By Kim A Stephens

In collaboration with Glen Brown, Carrie Baron, Rémi Dubé, John McMahon, Kim Fowler, Stan Westby, Robert Hicks and Jim Dumont

Note to Readers: During the November-December 2010 period, the Water Sustainability Action Plan for British Columbia released a series of five articles that are designed to inform local governments and others about a 'course correction' for **Integrated Stormwater Management Plans (ISMPs)**. The fourth in the series introduced the 'infrastructure deficit' as a driver for the ISMP Course Correction. It connected the dots to Asset Management as a way to re-focus the ISMP process on what really matters. This article is adapted from that series.

Prepare Communities for Change

Use of the ISMP term is unique to British Columbia. First used by the City of Kelowna in 1998, the term quickly gained widespread acceptance by local governments and environmental agencies to describe a comprehensive approach to watershed-based planning in an urban context. In 2001, Metro Vancouver's member municipalities recognized the benefits of integrating hydrology, ecology and land use and made a commitment to the Province to have ISMPs in place by 2014 for their watersheds. Geographically, about half of British Columbia's population resides within these watersheds.

When the Province released **Stormwater Planning: A Guidebook for British Columbia** in 2002, the ISMP approach was expanded and became a recognized provincial process. A decade ago, the approach reflected a significant shift in community values. The implicit goal was to build and/or rebuild communities in balance with ecology – that is, accommodate development while protecting property and aquatic habitat. A decade later, 'climate change' and 'sustainable service delivery' have also become integral parts of the goal.

The term Sustainable Service Delivery describes a life-cycle way of thinking about infrastructure needs and how to pay for those needs over time. The link between asset management and the protection of a community's natural resources is emerging as an important piece in Sustainable Service Delivery.

The Province's **Living Water Smart** and **Green Communities** initiatives constitute an over-arching policy framework that encompasses both the 'ISMP course correction' and asset management. They are preparing communities for change: start with effective green infrastructure and restore the urban fabric. Actions and targets in Living Water Smart encourage 'green choices' that will foster a holistic approach to infrastructure asset management.



A watershed-based plan that is outcome-oriented is a potentially powerful tool to achieve a vision for 'green' infrastructure that: protects stream health, fish habitat and fish; anticipates climate change; connects the dots to Sustainable Service Delivery; is affordable, and is supported by the community.

Do More With Less

An increasing local government 'infrastructure deficit' means that there will be even more competition for available funding. Simply put, this means the cost to renew or replace aging infrastructure exceeds taxpayer ability to pay the cost. The unfunded liability is increasing year after year. Thus, a driver for the ISMP Course Correction is to demonstrate how to 'do more with less' by placing emphasis on what really matters and being outcome-oriented.

Asset management usually commences after something is built. The challenge is to think about what asset management entails BEFORE the asset is built. This paradigm-shift starts with land use planning and determining what services can be provided sustainably, both fiscally and ecologically.

Local governments can develop a truly integrated Asset Management Strategy that views the watershed and the strategy through an environmental lens. This outcome can be achieved through a front-end effort that connects with the community and gets the watershed vision right. Then create a blueprint to implement green infrastructure that truly restores the urban fabric. Recognize that implementation will be a multi-decade commitment.

In the minds of some, the main purpose of an ISMP is to identify infrastructure shortfalls and provide a capital plan for future implementation. Going forward it will be necessary to resolve this apparent divergence in expectations and correctly attribute

future costs to sustaining the environment versus infrastructure renewal. To that end, key objectives of watershed-based Sustainable Service Delivery are identified as follows:

- Recognize that each watershed area is unique, and its needs are unique.
- Integrate drainage planning with land use, environment, parks, and other infrastructure and community needs.
- Have short, medium and long term goals / visions for the plan area, complete with integration of opportunities.

The linkage to asset management is a way to (re)focus ISMPs on outcomes: create a vision of a future watershed complete with intact environmental values, healthy streams abundant fishery resources, and a functional infrastructure. In this context, use of the word 'stormwater' is dated because it is associated with a 'pipe-and-convey' engineering philosophy; and reflects a single function view of the rainwater resource. Furthermore, stormwater is created by human activities.

All in all, the 'stormwater' way of thinking is the antithesis of RAINwater management – which is holistic, landscape-based, seeks to capture rain where it falls, and is guided by a 'design with nature' philosophy. Thus, the time is now right to make the vocabulary change to **IRMP** from ISMP, where IRMP is the acronym for **Integrated Rainwater Management Plan**. This re-branding will help facilitate the current paradigm-shift in the local government setting.

Everyone needs to be thinking in terms of life-cycle costs, especially future recapitalization of the investment. Historically this has not been considered as significantly in traditional infrastructure decision-making. While developers and new home purchasers pay the initial capital cost of municipal infrastructure under either greenfield or redevelopment scenarios, it is local government that assumes responsibility for the long-term cost associated with operation, maintenance and replacement of infrastructure assets.

A rule-of-thumb is that the initial capital cost is about 20% of the life-cycle cost. The other 80% represents an unfunded liability. This underscores the vital necessity of making a sound front-end infrastructure investment decision. Don't build a liability!



Embrace a Level-of-Service Approach

Land use planning in British Columbia may be significantly improved when integrated with asset management planning in local governments. The legislative authority for integration of land use planning and asset management, including financial management, already exists within the Local Government Act and Community Charter.

'Level-of-Service' is the integrator for everything that local governments do. What level of service does a community wish to provide, and what level can it afford? Everyone will have to make level-of-service choices. Thus, a guiding principle for an IRMP could be framed this way: Establish the level-of-service that is sustainable to protect watershed health, and then work backwards to determine how to achieve that level of protection and level of drainage service.

From the stream health perspective, appropriate and effective green infrastructure is a way to increase the level-of-service – for example, green infrastructure that restores the rainfall absorption capacity of the watershed landscape will increase the level of ecological protection. Also, water-centric green infrastructure that maintains or restores the natural water balance has value because it protects aquatic habitat and hence stream health.

To make the link, think in terms of the 'Level-of-Service' an urban tree canopy provides for rainfall interception. As trees grow, the interception capability increases; and the 'infrastructure value' of this natural asset appreciates. This contrasts with pipe assets that depreciate over time.

The process of establishing an acceptable 'Level-of-Service' will require local governments to reassess the rationale for existing practices and standards; and determine whether and what changes may be necessary in future to achieve a balance between cost, affordability and community willingness to pay. If, for example, application of new standards that accommodate climate change would trigger a costly upgrade of existing drainage infrastructure to provide greater system capacity, one could question whether the perceived benefit would justify the cost - particularly if there is no extensive history of widespread flooding and damage resulting from rainfall or storms. One could then ask whether different criteria might result in a lower cost solution.

A shift to a **'Level-of-Service'** approach would be a more rational way of providing community infrastructure with acceptable levels of service and cost. The level-of-service concept may need to include a revision of the design standard to a uniform drainage capacity rather than one subject to changing design frequency and intensity.

In short, attribute the costs to the infrastructure, not to the vision of the watershed and not to reduction of impacts to the stream.

Improve the Resiliency of Communities

The accelerating pace of change in our communities will continue, requiring local governments to become much more nimble, collaborative and integrated with a long-term focus. Each local government may determine where to start based on its particular circumstances - whether that be an asset management policy or plan, corporate strategic plan, long-term financial plan or IRMP - but the longer these plans are delayed, the more drastic and/or necessary the following measures will be in order to survive financially:

- Lowering of service levels;
- Reduction or elimination of some assets;
- Challenging risk acceptance limits;
- More collaboration and partnerships; and
- More user pay charges.

The change is here, and it is accelerating. Local governments have an opportunity to mitigate the infrastructure deficit and adapt to climate change within existing legislative authority and by means of a 'design with nature' approach to green infrastructure practices, respectively. The combination will improve the resiliency of communities.

Thus, with respect to landscape-based rainwater management, an **Integrated Rainwater Management Plan** is a vehicle for local government to strategically connect the dots between land use planning, development and infrastructure standards, and asset management. And by 'designing with nature', a local government could make a very strong case for having a higher level of service, at a lower life-cycle cost, with 'assets' that appreciate, not depreciate.

Collaboration, a 'Design with Nature' approach, and re-use of resources are keys to climate change adaptation and infrastructure deficit mitigation

- Develop compact, complete communities
- Increase transportation options
- Re-use and recycle water, energy & nutrients from liquid wastes
- Protect and restore urban 'green' space
- Strive for a lighter 'water footprint'
- Achieve higher levels of stream, wetland and marine environment protection

The bottom of the slide contains five small images: a modern house with a green roof, a large green field with purple flowers, a street view with a green roof, a street view with a green roof, and a street view with a green roof.