

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*

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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

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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>

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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**.

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‘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.

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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.

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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.

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**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

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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.

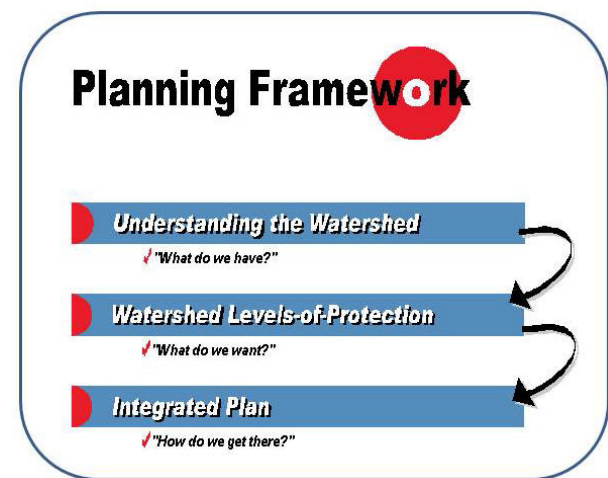


Planning Framework

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.

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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.

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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.

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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’.

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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.

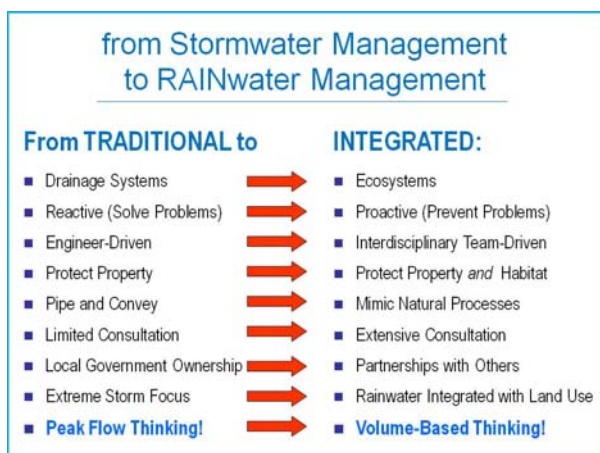
Recommended Framework for Action

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.



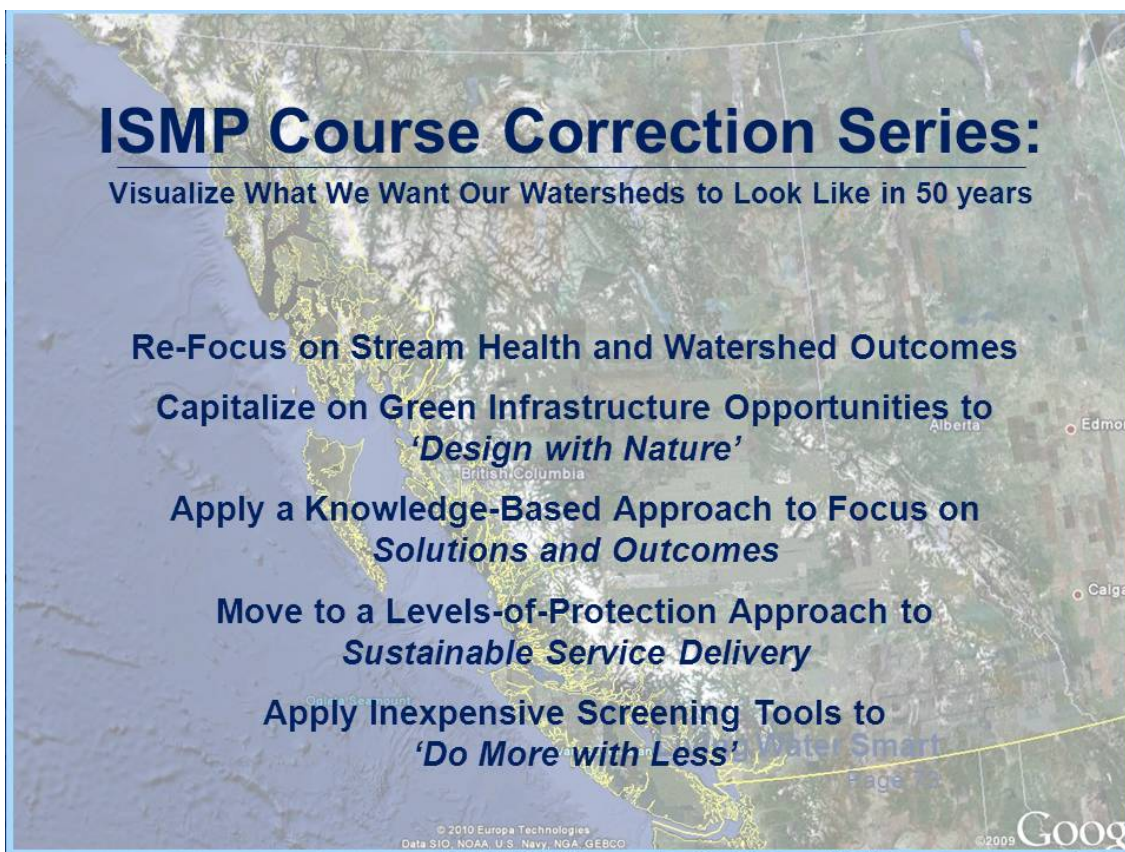
Shared Responsibility



"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

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ISMP Course Correction Series:
Visualize What We Want Our Watersheds to Look Like in 50 years

- Re-Focus on Stream Health and Watershed Outcomes
- Capitalize on Green Infrastructure Opportunities to
'Design with Nature'
- Apply a Knowledge-Based Approach to Focus on
Solutions and Outcomes
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