

Developing Outcome-Oriented Watershed Plans

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7. Developing Outcome-Oriented Watershed Plans

This chapter provides local governments with 'how to' guidance for developing **outcome-oriented** urban watershed plans. Chapter 1 introduced ten Guiding Principles that provide a framework for a successful implementation process:

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 case study experience introduced in previous chapters 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.

A Municipal Perspective: "Our municipality can learn and borrow from the other successful case studies, municipal experiences, and resources that are readily available to us," notes Rodney Stott, Environmental Planner with the District of Maple Ridge. "We are at an important cross roads where we are ready to make some minor amendments to our municipal tool kit that can lead to some significant improvements with respect to our current planning, engineering, operations, and building practices."



"There are quite a few communities in British Columbia that have been implementing higher level design and construction standards which can lead to more attractive and functional solutions. It has been proven out by others that this can be done in a way that doesn't have to be too prescriptive."

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," states Tim Pringle. "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."

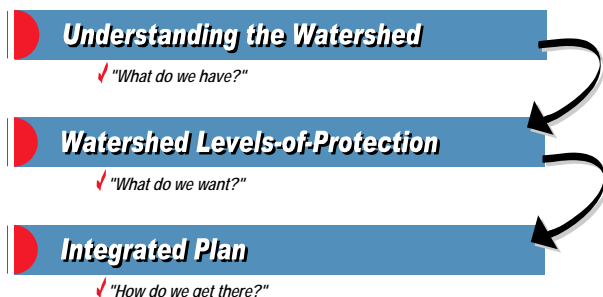


Planning Framework: According to Tim Pringle, the 'convening for action' experience has demonstrated that four ingredients will be in the mix when practitioners in a local government setting undertake to develop outcome-oriented plans. The participants will have to collaborate to:

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 we have 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," he concludes.

Planning Framework



Leading and Implementing Change

A pattern is emerging. Local governments in BC are embracing outcome-oriented approaches. This chapter introduces and profiles those who are applying the ten Guiding Principles and establishing 'design with nature' precedents:

1. Bowker Creek Blueprint (*refer to p. 23*)
2. Comox Valley Regional Team (*refer to p.50 -52*)
3. Vancouver Island Municipalities (*Nanaimo, Campbell River, Ucluelet, Langford, View Royal, Central Saanich, Sooke*)
4. Metro Vancouver Municipalities (*Surrey, North Shore, Langley Township, Delta, Vancouver*)
5. South Okanagan Partnership

A New Form of Governance: "The Bowker Creek Blueprint is all about what I call a new form of governance. It is quiet, silent and very effective. It starts with a vision. It is about turning the whole game plan around to a new way of doing business," observes Eric Bonham, a founding member of CAVI and a former Director in two provincial Ministries.



"What I like about the Bowker Blueprint is the temerity, the audacity, to have a 100-year vision. We need to have a 100-year vision because it takes time to turn things around when one is talking about watershed health. If we do not implant the long-term vision, we will end up with the usual death by a thousand cuts."

"The Bowker Blueprint is about reclaiming what was lost due to our past indifference. We are now talking about how to reverse the trend and bring settlement back into balance with ecology."



Achieving Watershed Outcomes

Table 2 identifies what municipalities will need to do to create liveable communities and protect or restore stream health. These outcomes require a truly integrated process that is founded on the ten Guiding Principles (*refer back to pages 1 and 67*).

The methodology embedded in the Water Balance Model powered by QUALHYMO enables a watershed target to be established; it also enables the user to assess how to meet the watershed target at the site scale (*refer to pages 44 and 65*).

There must be clear linkages between the targets and development approval processes. Financial and legal tools must also be in place to ensure implementation of outcome-oriented strategies.

Integrated Stormwater Management Plans: When the Green Infrastructure Partnership and the IGP developed Table 2 in 2008, a key objective was to provide local governments with a bridge from the Guidebook to Beyond the Guidebook. The need for this bridge had resulted from local government experience in undertaking Integrated Stormwater Management Plans (ISMPs).

As explained in Chapter 1 of the Guidebook, "Use of the ISMP term is unique to British Columbia. The City of Kelowna first used the term in 1998 to make a clear distinction between 'suburban watershed management' and the Province's 'integrated watershed management' process for natural resource management in wilderness watersheds. This is an important distinction. Local government typically has control over stormwater in residential, commercial and industrial land uses. It does not necessarily have control over watersheds."

Chapter 9 in the Guidebook elaborates on how to develop and implement an ISMP.

Unintended Consequences: The intent of an ISMP is two-fold in scope: integrate engineering, planning and environmental perspectives; and facilitate holistic solutions to protect natural resources that are at risk. The unintended consequences of ISMPs completed to date have informed the course correction described in Beyond the Guidebook 2010.

Table 2

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

Action	Level of Commitment
<p>Complete and implement integrated rainwater/stormwater management plans that are affordable and effective in protecting or restoring Watershed Health</p>	<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.
<p>Embed “IRMP” landscape-based strategies in neighbourhood concept plans</p>	<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.

ISMP Template

The 'unintended consequences' revolve around application of the ISMP Terms of Reference Template 2005. Developed by Metro Vancouver, the Template is nested within the Guidebook. The *Liquid Waste Management Plan* approved by the Province in 2002 included a commitment by Metro Vancouver municipalities to integrate land use and drainage planning. This was the genesis for the ISMP Template.

"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 Reference Panel in its Final Report.

When the Reference Panel reported out to Metro Vancouver regional politicians in July 2008, it identified the ISMP process as the 'elephant in the room' for the region because 130 plans "would potentially result in an aggregate unfunded liability that could easily equal the \$1.4 billion cost of sewage treatmentthe issue is known, but there seems to be a reluctance to 'tell it like it is'."

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."

"The elephant in the room" – unfunded municipal liabilities resulting from:



Unintended outcomes of ISMPs
(Integrated Stormwater Management Plans)

Letting Go of the ISMP Template in the CRD:

At the Bowker Creek Forum, Jody Watson of the Capital Regional District (CRD), and the Chair of the Bowker Creek Initiative, stated that a defining moment in the Bowker Creek Blueprint process was the decision to 'let go of the ISMP Template'.



"We started the planning process by retaining a consulting firm to develop a Master Drainage Plan. A deliverable was the terms of reference for an ISMP."

"We established a sub-committee to review what the consultant had proposed. As we went through the ISMP Template, we had discomfort as to what we were going to get at the end of the day; and what would be valuable for all of us, and in particular for the municipalities (Saanich, Oak Bay and Victoria)."

"We already had the experience with the master drainage plan; and the major capital costs associated with that plan – in the order of \$20 million to \$40 million. There was huge discomfort at the municipal level in trying to take those costs forward to their Councils. They wouldn't do it."

"There came a time when we just had to let the ISMP Template go. While part of the reason was that it was too engineering-centric, the biggest reason was that we did not have the funding. ISMPs are very expensive and consultant-heavy."

"We took a step back and decided that the best way to go forward was to bring in a facilitator who was not an engineer. Collectively, we found that we had all the information that we would need. The facilitator helped steer the committee through a process. We were successful."

Letting go of ISMP Template

We let the Template go because:

- Big dollar amounts
- Too strategic – needed specific details
- Engineering-centric
- Expensive modeling - what would it tell us that we did not already know
- Not enough funding to complete study

Instead, we relied on:


- Collective knowledge of committee & previous studies
- An external facilitator to help pull everything together

Bowker Creek Blueprint

The Bowker Creek Initiative (BCI) demonstrates how to apply a 'regional team approach' to urban watershed restoration in the Georgia Basin. The players driving the BCI have brought their shared vision to fruition through development of the **Bowker Creek Blueprint**.

Why Bowker Creek?

A pilot for other watersheds within the region

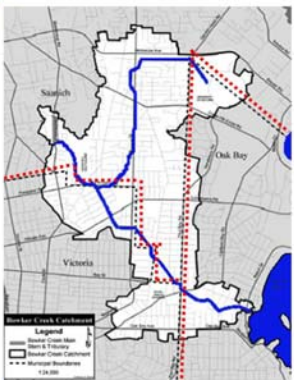


- Learning opportunities for a new way of doing business
- Raising public and institutional awareness
- Multi-jurisdictional watershed
- Location in the urban core with many interested residents

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 in February 2010. "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's storytelling 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.



Watershed

- Area ~ 1,020 hectares
- ~ 56% impervious
- Mostly clay soils
- ~ 30,000 residents

Main channel

- ~ 8 km long
- > 60% in culverts
- Hardened bottom and banks
- Open reaches largely non-functioning

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 do we need a blueprint?

- Details needed for municipalities to incorporate actions into their plans and budgets
- Directed change in the urban environment requires a solid plan over the long term



Why the Blueprint: "In 2003, the three municipalities and the CRD Board approved the *Bowker Creek Stormwater Management Plan*", stated Jody Watson. "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 a holistic way that enabled the members of the team to apply their collective best judgment, reach-by-reach," emphasized Jody Watson.

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 as 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.



Comox Valley Regional Team

"In the Capital Regional District, the regional team approach emerged as an outcome of the Bowker Creek Initiative. This took many years of trials and tribulations. In the Comox Valley Regional District, on the other hand, there was an upfront decision by the players in 2008 to embark on a journey as a regional team," states Kim Stephens.

"Either way, an over-arching message is that it takes time and patience for stakeholders in a local government setting to first align and then integrate their efforts. And similar to the Bowker experience, a 'top down bottom up' strategy for watershed governance is emerging in the Comox Valley. In both cases, community advocates are at the table as partners with local government. This partnership theme is a common thread with the Metro Vancouver Reference Panel."

A Provincial Pilot

"The Comox Valley is a provincial pilot for demonstrating a regional team approach because the four local governments stepped up to the plate. The Learning Lunch Seminar Series (*refer to p. 50-52*) is the vehicle for bringing people together and generating momentum. We are all learning from the process," continues Kim Stephens.

Support from the Top: High-level endorsement for launching a 'regional team approach' was provided when Mayors and Chief Administrative Officers representing the four Comox Valley local governments dropped in to show their support for the 2008 Learning Lunch Seminar Series. This moment is recorded on YouTube.



Sandy Gray, City of Courtenay CAO, lauded the objectives of the Learning Lunch Seminar Series. "We are thrilled by the work of CAVI. It is a tremendous initiative," he said. "The cooperation that is taking place around a consistent approach to development is very critical to all of Vancouver Island."



Regional Response to Climate Change

"Watershed-based land use planning has real meaning on the ground for the Town of Comox," states Glenn Westendorp, Chair of the 2010 Learning Lunch Series. "Because Comox is downstream of future developments located within the regional district, we require a unified and consistent regional approach to rainwater management and green infrastructure."



2010 Learning Lunch Series: "The Series theme, *A Regional Response to Climate Change*, defines the desired outcome. This shows how far we have come as a regional team in three years. We are ready to establish performance targets for integrated land and water management."

"At the end of 2010, the four local governments will prepare a Joint Report for our politicians. We will summarize tangible outcomes from the 3-year program. That will be their moment to endorse an holistic approach to green infrastructure, one that integrates rainwater and drought management strategies. The Comox Valley planners already have a Memorandum of Understanding for review of land development proposals. This MOU has established a precedent for inter-governmental collaboration," concludes Glenn Westendorp.

Collaboration, Adaptation and Risk Management A Regional Response to Climate Change

- 1. Collaboration:**
Comox Valley Regional Initiatives (So What)
- 2. Adaptation:**
Design with Nature to Achieve Rainfall Capture & Water Conservation Goals (Now What)
- 3. Risk Management:**
Respect the Power of Mother Nature (Then What)

Vancouver Island Municipalities

A distinguishing feature of the CAVI program is the networking, sharing and relationship-building that have been enabled by Showcasing Innovation and Learning Lunch series.

This section draws attention to seven other Vancouver Island municipalities (Figure 19) that have contributed to the success of the CAVI program by sharing their stories. Each is raising the bar by incrementally implementing a new culture that achieves the goal of urban watershed protection.

North of the Malahat: The cities of Nanaimo and Campbell River, and also the Village of Ucluelet, have successfully challenged their local development communities to meet higher municipal expectations for 'green' development.

South of the Malahat (Capital Region): The City of Langford, Town of View Royal, District of Central Saanich and District of Sooke have all established provincial precedents related to rainwater management and green infrastructure.

A Ministry of Environment Perspective

At the 2008 Vancouver Island Learning Lunch Seminar Series hosted by the City of Courtenay, Margaret (Maggie) Henigman of the Ministry of Environment's Nanaimo regional office provided this perspective during a town hall sharing session: "Since 1996 I have been working across Vancouver Island, both reviewing development proposals and monitoring project implementation. In the last couple of years I have been really pleased to see a huge shift take place in the way projects are being done."



"As I reflect on the current Vancouver Island situation, it strikes me that we have created a new social norm; and it is being accepted by the development community as a whole. The change in attitude is really gaining momentum. Everywhere I go I am seeing evidence of the new ethic. It is not that everyone is perfect, but the change is really coming along."

The Development Context

"Vancouver Island offers large tracts of privately owned land, communities with urban/rural character, and unique natural amenities, in particular access to waterscapes, which attract large-scale development. We have observed that development proposals for complete communities, resort-based and mixed-use developments rely on these assets," states Tim Pringle.

Scale of Projects: "Over the last three years, we have been presenting the results of our ongoing research at CAVI events. In 2008, for example, we examined and categorized 40 land development projects that have an aggregate value of more than \$10 billion. It is all about scale. These are big projects; they take up lots of land, and therefore have an impact on the landscape."

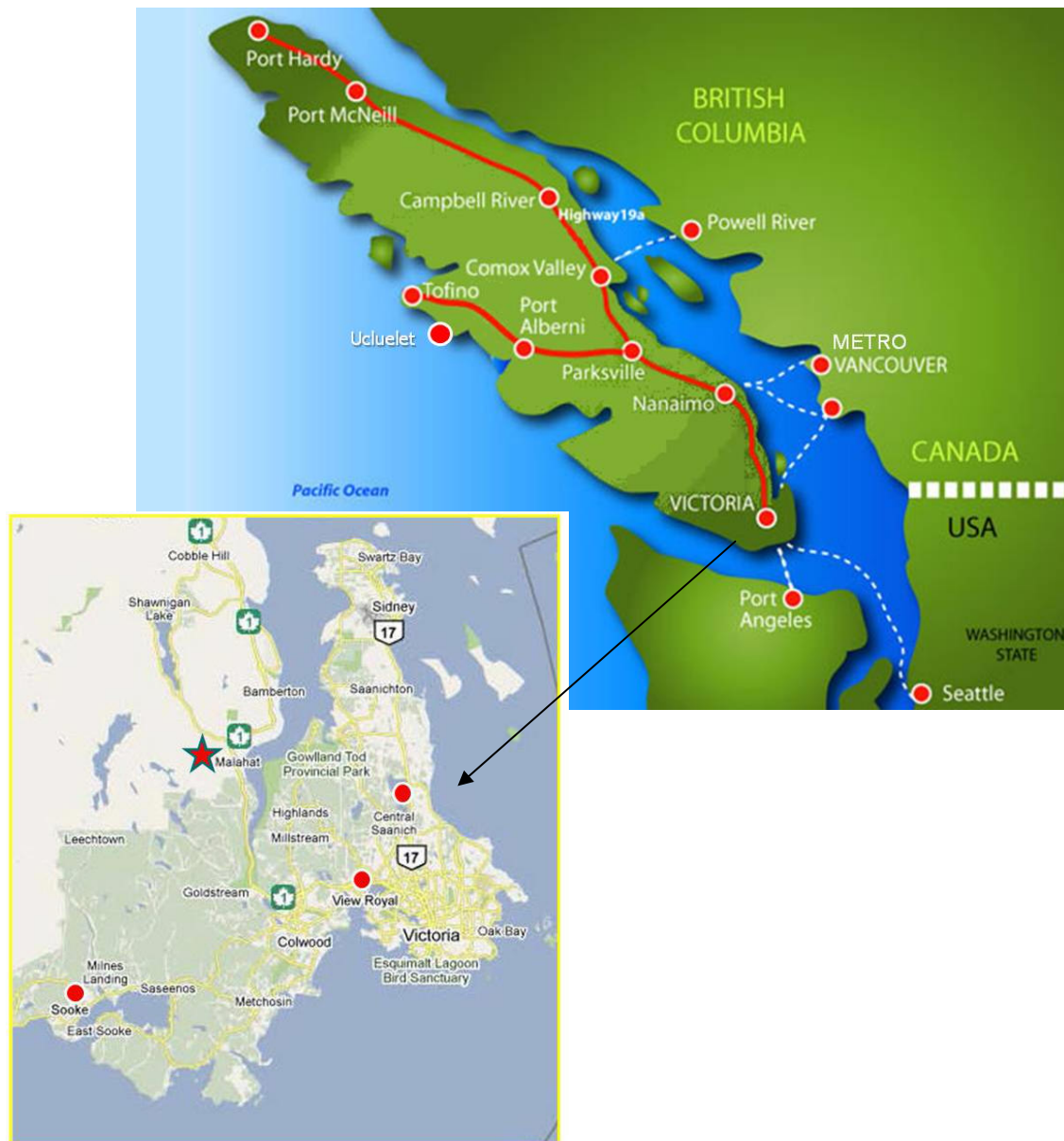
Proposed Residential and Mixed Use Development Projects With a Value ≥ \$15 million		
Number of Projects	Value of Projects (\$ billions)	Proportion of Total Value
40 in total	\$10.400	100%
3 are 'light green'	\$0.133	1%
8 are 'deep green'	\$5.908	57%
29 are conventional	\$4.369	42%

Reference Sources:
 Stats BC major projects inventory
 Conversations with developers
 Interviews with local government planning departments

Market-Niche to Market-Share: 'Green Value' refers to the intentions of land owners and developers to implement a range of strategies that recognize and protect ecological values at a watershed, sub-region and/or site scale.

"Overnight, Green Value development has moved from market-niche to market-share. In 2006 and 2007, development defined as 'deep green' accounted for about 10% of the value of residential building permits in five regional districts. Looking at what is currently on the books for projects with a value greater than \$15 million, Green Value development accounts for roughly a 60% market share, a six-fold increase."

"Whether or not all of these projects actually get constructed, this finding indicates that the development market sees advantages to incorporating green strategies in the design of large projects," concludes Tim Pringle.



Location Maps for Vancouver Island Municipalities:
North and South of the Malahat Summit

Figure 19

North of the Malahat Summit

The Inland Kenworth truck and heavy equipment facility in the City of Nanaimo illustrates what can be accomplished through collaboration when a municipality challenges a development proponent to be innovative.



Turning the Tide in Nanaimo: According to Dean Mousseau, the City's Manager of Development Engineering, "We view this project as the one that changed the thinking of the consulting community in Nanaimo, particularly on redevelopment projects. We are turning the tide because development and redevelopment projects are now incorporating features for rainwater runoff capture."



"Inland Kenworth set in motion a chain of events. We are now working with a development community stakeholder group to establish **Green**



Design Guidelines in conjunction with updating the City's current general design guidelines, found within the Official Community Plan," continues Gary Noble, the City's Development Approval Planner.

"The Green Design Guidelines will establish a new baseline that incorporates a more environmentally sustainable approach. The intent is that the guidelines will evolve as the development community becomes increasingly familiar with what works and what does not," adds Rob Lawrance, Environmental Planner.



From Vision to Implementation in Ucluelet: At the 2007 Green Infrastructure Leadership Forum,



Felice Mazzoni (Director of Planning) captivated the audience when he told the story of how the District of Ucluelet had asserted control over its destiny during an era of rapid change.

"With a clear vision that everyone is committed to, it is possible to create an integrated whole that, over time, fulfills that vision. In Ucluelet, key elements of our vision reflected the desire to accommodate growth yet at the same time maintain a rural 'feel'. As well, we wanted to include sustainability initiatives."

"Ucluelet has applied planning principles that are transferable to larger cities or other rural communities that are experiencing development pressures," concluded Felice Mazzoni.

Integration in the City of Campbell River: At the 2009 Comox Valley Learning Lunch Series,

Rob Buchan explained the City of Campbell River's approach to inter-departmental integration; and how the Development Review Committee is helping to achieve the City's sustainability vision. He is the manager of the newly created Land Use Services Department.



"Two major considerations in working together are structure and small 'c' culture," stated Rob Buchan. "Our new structure facilitates working together. Everyone in the department has something to do with land use and development."

"Our Development Review Committee is an example of how process (small c cultural) can assist the communication process. We can invite developers in at any stage in the application. Earlier is better because then we have more ability to effect positive change. We invite other stakeholders as well: fire, parks, sustainability and environment. We all sit there together. We hear the application. We talk about it and we communicate. This forces us out of our silos."

"Our interests are not always the same. We have to dialogue and come up with solutions. This facilitates the ability of the departments to work together as a team towards the corporate goals."

South of the Malahat Summit

The City of Langford is represented on the CAVI Leadership Team; and was a host municipality for the 2008 Showcasing Innovation Series.

Learn by Doing & Manage Risks in Langford:

The City of Langford was an early proponent of rainwater infiltration - in fact, its Subdivision Bylaw calls for 100% on-site rainwater management. The Langford experience serves as a case study application of how to implement Adaptive Management as envisioned in *Stormwater Planning: A Guidebook for British Columbia*.

At the heart of the City's approach to innovation is its corporate philosophy for managing risk, learning by doing, and adapting quickly to new information and changing circumstances. "A corporate culture that is willing to accept and then manage risk with regards to infrastructure standards can open the door to creativity, innovation – and its rewards," states John Manson, City Engineer.



"The City is prepared to take risks, and we have a development community that is open to new ideas. We will often suggest pilot projects when we are not sure about the risks or the consequences. We are not afraid to make the odd mistake.....because the corporate philosophy recognizes that being innovative includes an experimentation factor. We strive for 95% successful implementation; and we just keep adjusting to deal with the 5% exceptions."



Innovation in View Royal: In 2007, the Province rewarded View Royal with a \$7.4 million infrastructure grant for its vision and innovation in developing an ecosystem-based plan for retrofitting the old Island Highway with transportation and rainwater management enhancements.

Rain gardens are a core element of the design with nature strategy. "A driver is restoration of water quality in Portage Inlet, often described as the jewel of Victoria," states Emmet McCusker, Director of Engineering.



"We are talking in terms of a major shift in the way people think about their road frontage. It will be really important to develop a community spirit that in turn fosters an ethic. To that end, the Town will be partnering with community groups to take the "my rain garden" concept from vision to reality."



'Green' Roadways: The View Royal showcasing innovation day was built around an interactive group exercise. The *View Royal Template* for grant applications was applied to four case study examples provided by participating municipalities (Sooke, Langford, Metchosin and Victoria).

"To provide reality, each group was tasked with developing a concept for enhancing a specific section of a real road located in each of four municipalities," explains Emmet McCusker. "We shared our View Royal Template so that we could help our peers bring their innovative ideas to the forefront when they apply for infrastructure grants. We wanted to raise the bar in the region."

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

Rainwater Management in Sooke: The District is the first BC municipality to produce a stand-alone *Liquid Waste Management Plan for Rainwater*.

"We followed the Ministry of Environment's 'Proposed Guidelines for Preparing Liquid Waste Management Plans', released in March 2004. At the same time, we updated our OCP. The timing was perfect. This provided direction," reports Laura Byrne, Engineering Technologist.



Sharing and Collaboration: "Partnerships are so vital. Furthermore, networking was key to doing the Liquid Waste Management Plan affordably. By working with other agencies, and not duplicating efforts, we got it done. Now we are proceeding with development of Rainwater Management Plans for 18 watersheds over 7 years. Four are completed."

"Because Sooke is a small municipality with limited financial resources, we have had to pare down and make the plans practical in order to be affordable. Again, networking and collaboration are making it possible for us to do this effectively."

"The Rainwater Management Plans provide a framework for the development of on-the-ground solutions for the management of rainwater at a watershed scale. Also, they integrate planning for drainage infrastructure and ecological assessment and restoration with municipal planning processes. This integrated approach provides solutions to drainage and ecological concerns. We recognize the value of healthy watersheds – we know what we have to protect."

Rainwater Source Control: The District of Sooke is working on revising its *Subdivision and Development Standards Bylaw* to require green infrastructure for rainwater runoff capture. It also encourages the use of the Water Balance Model.

'Green' Road: "The case study sharing exercise organized by Emmet McCusker in 2008 was tremendous. Our participation reaffirmed the direction Sooke was heading. We are now proceeding with construction of our 'green' road. The View Royal showcasing day provided us with tangible value!" concludes Laura Byrne.

Rainwater Management in Central Saanich: The District is a Water Balance Model Partner and is the first Vancouver Island municipality to create an ISMP in accordance with the methodology laid out in the Guidebook.

"Central Saanich received the **2010 Watershed Award** from the Federation of Canadian Municipalities; and also the CRD EcoStar Award," reports Nirmal Bhattacharya, P.Eng., MCIP, Municipal Engineer.



"The ISMP project was guided by a stakeholders committee that included government agencies, area farmers, local interest groups, residents and District staff. The District took all feedback and concerns into consideration and collaboratively developed an holistic and sustainable rainwater management plan that will be implemented over the next five to 20 years."

"Because Central Saanich is a Water Balance Model partner, it has embraced the vision of the Inter-Governmental Partnership to advance a 'design with nature' approach to land development," continues Roland Rocheleau, ISMP Project Manager.



Rainwater Source Control: In February 2010, Central Saanich Council adopted the *Surface Water Management Bylaw* to require rainwater runoff capture. It encourages use of the Water Balance Model at the individual property scale.

"The Bylaw was an outcome of the ISMP," states Nirmal. "There was already a clause in our engineering specifications that requires 'no net increase in runoff' after a site is developed. But it was redevelopment of a site with a large paved area that led us to re-think our approach. We said let's try to do something. This led us to create the Bylaw which now gives us the means to restore the water balance when properties redevelop."

"We are already seeing how people are viewing their properties differently now that we can point them to the Water Balance Model. Their use of the tool is raising their awareness of how they can achieve rainfall capture; and they are learning how to use soil and landscaping as an alternative to storage tanks," concludes Roland Rocheleau.

Metro Vancouver Municipalities

Ten municipalities in Metro Vancouver are Water Balance Model Partners. The cities of Abbotsford and Chilliwack in the neighbouring Fraser Valley Regional District are also partners.



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.”

“Comparing Metro Vancouver and Fraser Valley to the Bowker Creek approach boils down to ‘missed opportunities’. The 100-year Bowker Blueprint takes care of missed opportunities. 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. The City is doing the little things needed to create cumulative benefits over time.”

Overcoming Fear and Doubt

At a rainwater conference hosted by the University of British Columbia in June 2007, Kim Stephens drew on his Metro Vancouver experience to tell a story that provided the flavour of what it was like to be in the hot seat when introducing a new way of thinking and doing in 2000.



“During the 2000-2001 period we had to overcome fear and doubt in order to move ahead with projects such as the East Clayton Sustainable Community in Surrey, and UniverCity on Burnaby Mountain. It was David Reid who coined the *overcoming fear and doubt* mantra; it stuck and became an integral part of the UniverCity story.”

“By early 2001, we were literally hanging on by our fingernails. At the time, it was Patrick Condon of UBC who said: *“If we fail, it will be a generation before anyone will even have the opportunity to try again; so we must not fail.”* Well, we did not fail. And because we succeeded with East Clayton and UniverCity, those hard-fought successes have ultimately made it possible to change land development practices to capture rain where it falls.”



Stoney Creek ISMP: Because Simon Fraser University is situated at the top of the Stoney Creek drainage system, the Stoney Creek ISMP established the rainwater management criteria and set the bar for the community development that has followed at UniverCity.

The inter-municipal Stoney Creek plan (Burnaby, Coquitlam, Port Moody) was the pilot ISMP for the Metro Vancouver region, and was awarded the *2000 Environmental Award* by the Association of Professional Engineers and Geoscientists of British Columbia. The Stoney Creek experience is embedded in the Guidebook.



City of Surrey – “From Pilot Projects to a Watershed Objectives Approach”

When the City of Surrey hosted the second event in the 2006 Showcasing Innovation Series, historical context was provided by Paul Ham, Surrey’s General Manager, Engineering. Paul Ham was also Chair of the Green Infrastructure Partnership from 2005-2008.

“The East Clayton Neighbourhood Concept Plan provided the first large-scale opportunity to ‘test’ a new approach advocated by Patrick Condon and others. This new approach, which is sometimes characterized as ‘the future is the past’, embodied a design with nature way-of-thinking about drainage,” stated Paul Ham.



“Looking back, it is sometimes hard to believe that almost a decade has passed since the City initiated the East Clayton plan. With the passage of time, we tend to take the early innovation for granted. From my perspective, one aspect which really stands out about the East Clayton plan is the integration of sustainability objectives.”

In providing context for City of Surrey actions over time, Ham highlighted three provincial initiatives that had an early influence on City of Surrey thinking. These were the UniverCity Sustainable Community on Burnaby Mountain, the Provincial Guidebook, and the experience of the City of Chilliwack when it developed its *Manual for Surface Water Management* as a feedback loop for Guidebook development.

“The early results from East Clayton combined with the on-the-ground experience of Chilliwack gave Surrey the confidence to implement new green infrastructure objectives in two plans – the Campbell Heights Economic Development Plan (1999-2000), and the Highway 99 Corridor Land Use Plan (2002). In fact, Council made the use of green infrastructure practices a condition of both plans.”

“Investigation of opportunities for the application of green infrastructure objectives is now expected in all the City’s land use plans. Furthermore, ISMPs will provide the basis for implementing green infrastructure objectives to support a design with nature approach on a watershed scale”, concluded Paul Ham.

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,” states Vincent Lalonde. In 2008, he succeeded Paul Ham as General Manager. “All of us need to understand and care about the goal if we are to

create the future that we all want. So we designed the *2009 Water Balance Model Forum* to start a dialogue between policy-makers and project implementers about shared responsibility.”

Watershed Objectives: “On the matter of implementing on-site rainfall capture, there is a fundamental difference between Surrey and other Metro Vancouver municipalities,”

continues Remi Dubé, Acting Development Services Manager with the City. “Surrey has moved beyond pilot projects; we are moving to a broader watershed objectives approach to capturing rain where it falls to better protect our streams.”



Water Balance Model Building Blocks: The Stream Health Methodology (*refer to page 44*) now embedded in the WBM evolved through three successive Surrey case studies: East Clayton, South Newton and Fergus Creek.

“East Clayton 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,” states Jim Dumont.

“But it was the South Newton case study where 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.”

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

Community Outreach in Surrey: The City has been proactive in going beyond the engineering boundaries to foster a change for the better in the community's 'land and water ethic'. The City's efforts to engage the broader community encompass homeowner outreach initiatives and educational programs in schools.

Online and Interactive Educational Resource: 'Sustainability in My Backyard' is an educational resource developed by the City. "What happens when it rains?" is a simulation of the path that water takes in different situations. Students can explore the impacts to nearby creeks and streams when water hits a built environment (refer to Figure 20 on next page)."

"The simulator offers students, teachers and Surrey residents an interactive way to discover the unique design elements of the East Clayton Sustainable Neighbourhood development," states David Hislop, City of Surrey Project Engineer.

"Also, they can explore the impact of rain and drainage on the nearby North Creek by comparing different rain scenarios and how the sustainable design features work."



"Students compare the impacts based on traditional neighbourhood development techniques, to the impacts when the sustainable design features are employed."



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

"To sustain the early momentum, each successive homeowner 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: "We are really excited about the impact that Robson Creek daylighting has had in mobilizing the community in a 70-year old neighbourhood in North Surrey (refer to Figure 20 on next page)."

"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. Everyone else seems to focus on the grade fives; in contrast, 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," concludes Carrie Baron.

Sustainability in My Backyard

Home | About East Clayton | Walking Tour | In the Classroom | Simulator

About Sustainability in my Backyard

This is an educational resource developed by the City of Surrey, B.C. It offers students, teachers and Surrey residents with an interactive way to discover the unique design elements of the East Clayton Sustainable Neighbourhood development.

City of SURREY
the future lives here.

Rain and Drainage Simulator

Explore the impact of rain and drainage on the nearby North Creek by comparing different rain scenarios and how the sustainable design features work.

About East Clayton

Get the background about the development, its design principals and sustainability features. See what East Clayton looked like in the early 1900s and how it looks today.

East Clayton Walking Tour

Take a virtual tour of East Clayton to see a series of sustainable design features. You can even print the information from this online tour if you want to take it along a site visit.

In the Classroom

Use the educator resources to explore the concepts of sustainable development. These include backgrounders, lessons and teaching strategies.

Environment Canada | Environment Canada | CITY OF SURREY | PASSION IN ACTION

<http://www.sustainabilityinmybackyard.ca/>



Robson Park Revitalization & Robson Creek Day-Lighting Project

Figure 20 – Examples of City of Surrey Success

North Shore Municipalities – “The Right Trees in the Right Places”

The District of North Vancouver, District of West Vancouver, and City of North Vancouver are founding members of the Water Balance Model Partnership.

Trees Intercept Rainfall: “Trees can intercept upwards of 50% of the rain that falls each year on a watershed. Removing the tree cover means that more and more rainfall is converted into runoff volume,” explains the District’s Richard Boase. “A quantum increase in runoff volume then impacts stream and watershed health. The impacts are cumulative consequences of repeated erosion and sedimentation.”



“On the North Shore mountainside, potentially doubling the runoff volume has major implications for rainwater and watershed management. Only so much rainwater can be infiltrated naturally or forced unnaturally into the ground. We need trees to reduce the proportionate volume of rainfall that eventually becomes runoff.”

“This need was a driver for the three municipalities collaborating to implement the North Shore Tree Canopy Interception Research Project (2006-2010) in partnership with UBC and others. The research has quantified the proportion of rainfall intercepted by the tree canopy in an urban setting.”

“The research has provided a science-based understanding about the benefits of maintaining a tree canopy in the urban environment. This understanding will inform stream health protection strategies on the North Shore and elsewhere. Soon, these findings will be incorporated in the WBM to populate a new Tree Canopy Module.”

A network of 60 *Tree Canopy Climate Stations* was established across the North Shore

... to investigate the effects of tree density, tree structure and tree species on rainfall interception



Rain Gardens at Bus Bulges: The City of North Vancouver is leading by example in demonstrating on-the-ground applications of a 'design with nature' way-of-thinking and acting. This is illustrated by drainage features constructed within the highly urban Lonsdale Avenue corridor.

"Rain gardens have been included in bus bulges on Lonsdale to minimize the impact of the built environment on the City's small streams. But this is just part of the picture," states Tony Barber, Manager of Engineering Planning and Design.



"The rain gardens also help to sustain the adjacent street trees and make the streetscape a more comfortable and attractive environment for walking. Studies have shown that appealing streetscapes also improve the viability of adjacent businesses."

"As far as the bus bulges themselves, they reduce transit dwell times and therefore help to make transit a more attractive alternative. So to sum it up, these bus bulges help to contribute to the social, economic and environmental aspects of the sustainability of the City of North Vancouver."

The drainage features have been praised by Corino Salomi of DFO (*refer back to p. 79*). "Not only do the features appear functional, they are visually appealing and interesting. Installing features like these 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."



District-Wide ISMP for North Vancouver: The District 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.

“Through our Official Community Plan Update, the District is advancing a vision for restoring the rainfall absorption capacity of our watersheds, one property at a time, over time,” states Richard Boase. Much like the visions for the **Bowker Blueprint** and Philadelphia’s **Green City, Clean Waters** plan, this will take a 50-year commitment.”

Risk to Watershed Health: “To draw attention to the urgent need for action on single-family residential properties, we have created a set of images to illustrate why and how watershed health is at risk. Mackay Creek is our case study.”

“The watershed is at maximum build-out; and is undergoing redevelopment as the older housing stock is replaced. We analyzed trends and examined specific properties to quantify the implications of an expanding house footprint. Within 20 years, 10 percent of the existing lots in the Mackay watershed could be redeveloped, with a consequent **25% increase** in impervious area and **10% increase** in annual runoff volume (refer to Figure 21 on next page for redevelopment example).”

“We are developing a set of prescriptive solutions that would reverse the trend. An absorbent topsoil layer is a fundamental building block. This is why the WBM team views the **Topsoil Law and Policy and Technical Primer Set** as a potentially powerful tool to help municipalities achieve a watershed restoration vision (refer back to p. 59).”

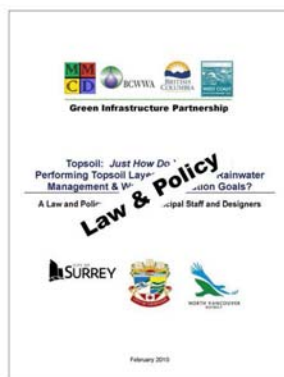
Watershed Landscape Restoration Strategy: “The District of North Vancouver has observed the experience of other municipalities that have applied the ISMP Template. They have spent a lot of money to get reports that say spend more money. The District simply cannot afford to go down a path that leads to engineering solutions that are unaffordable and unrealistic.”

“We suspect the ISMP process as currently defined is beyond the District’s financial ability to undertake and implement. Yet we are faced with a looming 2012 deadline to have work done to meet our regulatory commitment under the region’s Liquid Waste Management Plan.”

“We need an outcome-oriented alternative to the ISMP Template, and we believe we have it with our proposed **Watershed Landscape Restoration Strategy**. This is our District-Wide ISMP, and we hope to implement it through the current OCP Update (refer to Figure 21 on next page).”

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 an holistic strategy that is keyed to *cumulative and complementary steps*. We start with the individual property and we move out from there,” concludes Richard Boase.



In 20 years, 10% of existing single family lots could be redeveloped in the Mackay Creek watershed. Ecology is from the ground up. So, applying the Water Balance Model, we can theorize that by.....

- Improving top soil depth to 400 mm; and
- Collecting roof runoff on-site in a simple rain garden

We could potentially see results that show:

- ✓ 10% less impervious area per lot than existing
- ✓ 5% less annual runoff per lot than existing
- ✓ 42,000 m³ decrease per year rather than 105,000 m³ increase in total runoff volume

With the same redevelopment

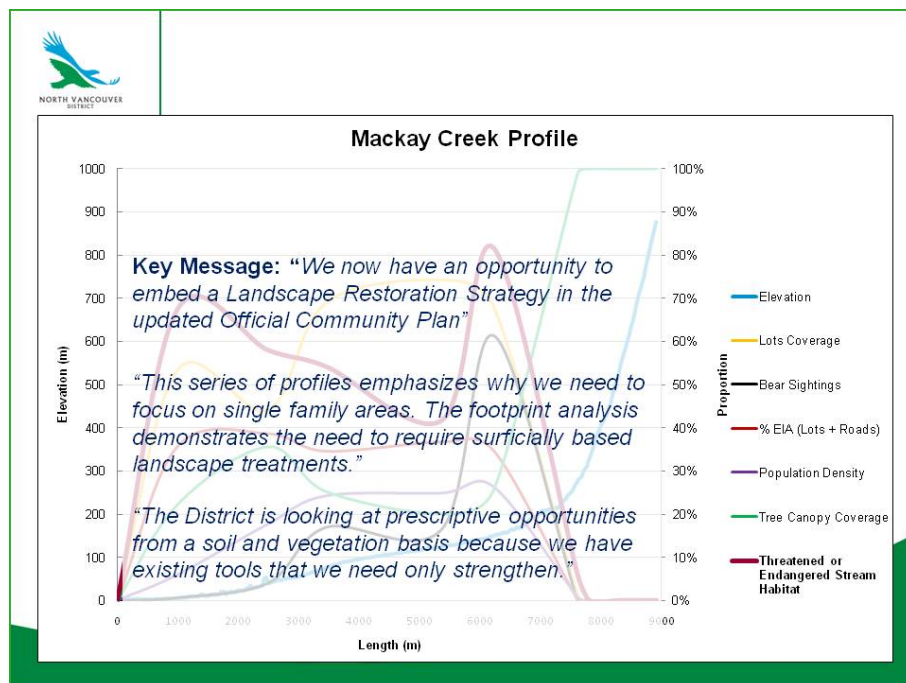
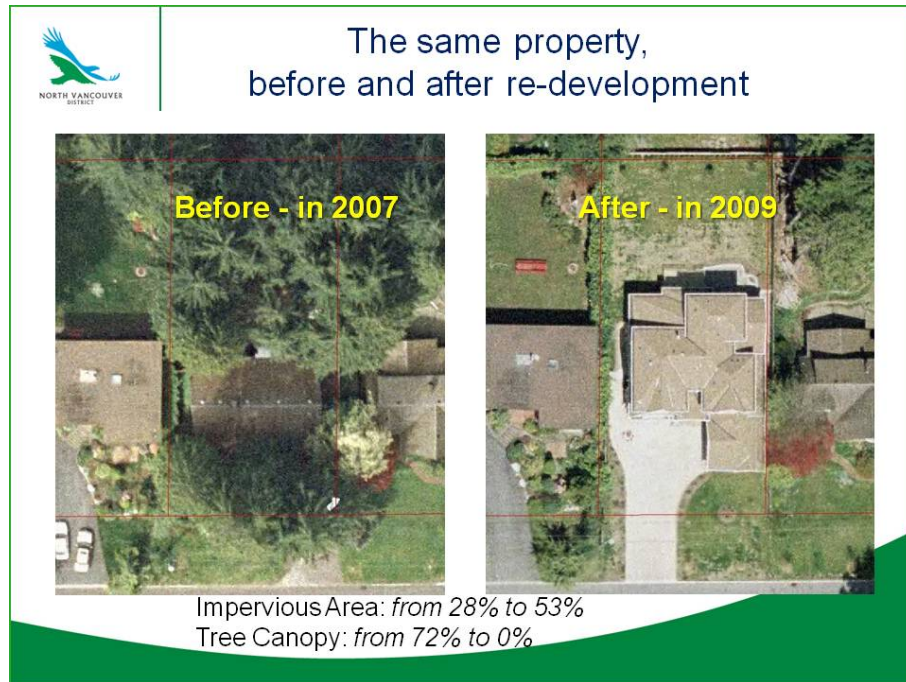


Figure 21 – Turning a Risk into An Opportunity in the District of North Vancouver

Langley Township, Delta & Vancouver – “Leading by Example”

Vancouver and Delta were founding members of the WBM Partnership. Langley Township joined two years later in 2005. All three municipalities have hosted Showcasing Innovation events.

New Neighbourhoods and Green Infrastructure Innovation in Langley: “The Township is *walking the talk* when it comes to putting sustainability into practice,” Colin Wright (General Manager, Engineering) stated at the 2007 event. “As municipalities, we are the focal point. We have to show leadership on-the-ground. We have to be in harmony with nature. When we are in harmony with nature, things will go well. In Langley, we believe there is a sea-change about to happen. The community is ready for green infrastructure.”



“The Routley, Yorkson and Northeast Gordon neighbourhood communities illustrate how a ‘water-centric’ approach is changing the way that land is developed in Langley,” stated Ramin Seifi, Director of the Community Development Division.



“Each neighbourhood features a different green innovation: A multi-purpose greenway and shallow infiltration systems on individual residential properties were first implemented in Routley; a ‘third-pipe system’ for roof drainage connects to a sand filtration treatment system and deep-well injection for aquifer recharge in Yorkson; and most recently, we have built truly ‘green streets’ in North East Gordon Estates.”



Landscape-Based Rainwater Management in Delta: “We have some 500 kilometres of roadways, and we have embarked upon a long-term program to systematically and incrementally improve the urban landscape. The corporate vision is to enhance community liveability by beautifying streets, one block at a time,” states Hugh Fraser, Deputy Engineer of Engineering.



“Within the engineering department, Delta has added a landscape designer to the engineering design team to assist with incorporating rainwater capture technologies into landscaped amenities that beautify roadways.”



‘Green’ Streets in Vancouver: By 2005, the City had established two BC precedents with the Country Lanes and Crown Street projects. These demonstrated the ease of rainwater infiltration.



Crown Street

Country Lane

“The City of Vancouver is proud to have contributed to the ‘working with nature’ philosophy and applying the principles of the WBM to the City’s Olympic Village project,” states the City’s David Desrochers, Manager, Sewers & Drainage Design. “Furthermore, we are looking forward to the success of the East Fraserlands redevelopment project as it will become the largest site application of the WBM in the City of Vancouver.”



South Okanagan Partnership

"In 2005, the Real Estate Foundation and the Water Sustainability Committee agreed to pilot a strategy emphasizing water-centric planning values in the context of several regional initiatives in the South Okanagan," states Tim Pringle. "The partners intended to use tools such as the Water Balance Model and relationships with regional stakeholder agencies as well as three Ministries (Agriculture, Community Services and Environment) to advance water sustainability in the planning." (Refer to pages 7 and 19)

"The initiative took on the name 'Convening for Action' and soon found itself contributing to the *Regional Growth Strategy* (RGS) process as well as *Smart Growth on the Ground* and the *Agricultural Area Plan*. The latter two projects pertained to Oliver & District and involved regional stakeholders as well as external participants."

Changing Land Ethic

"The March 2010 *Okanagan Water Supply & Demand Project Phase 2* report (by a partnership led by the Okanagan Basin Water Board) sums up the changing ethic about water sustainability in the region. The report describes a modelling component that 'developed an Okanagan water budgetthe results of Phase 2 show a need for more careful management and choices on development, the future of agriculture, and environmental protection'.



This shows the increasing awareness of the relationship between land and water, and the impacts of choices."

According to Tim Pringle, "Convening for Action decided to move its work to Vancouver Island in 2006, rather than be another layer of consultation in the South Okanagan. Operating as CAVI, it has refined its educational and research services to continue to support water-centric planning in the local government context." (Refer to Chapter 5).

South Okanagan Similkameen Conservation Program

A Convening for Action partner in 2005, the *South Okanagan Similkameen Conservation Program* (SOSCP), had a key stakeholder role in the RGS process (2005-2007). Bryn White, Program Manager, joined SOSCP in 2006 and noted its lead role on the Land Use Team, one of 6 teams contributing to the RGS process.

"We gained respect for our expertise about stewardship and conservation and helped form the five policies for the second goal of the RGS, 'Ensure the Health of Ecosystems'. SOSCP also assisted in developing the "performance indicators" needed to make these policies active," reports Bryn White.



"Convening for Action's influence was apparent in documentation (including graphics) and corporate knowledge used in producing the RGS plan. Several of my Board Directors asked me to pay attention to CAVI's ongoing work as a source of new practical ideas that could help SOSCP to devise and implement its strategy to enhance the capacity of local governments in the South Okanagan to implement RGS policies for protection of ecosystems."

"Currently, SOSCP is confirming funding for the second year of the *South Okanagan and Lower Similkameen Local Government Ecological Standards and Practices Capacity Building Initiative*. The budget of \$184,250 includes \$97,250 cash, of which 65% will be provided by local governments, SOSCP and the Okanagan Similkameen Conservation Alliance. The funding pays for the salary of an environmental planner and other support contractors shared by the three local governments committing funding. Not only does this initiative provide a round table for sharing issues and solutions, it offers a long-term commitment to the region's ecological well being."

SOSCP exchanges experiences with the Comox Valley Land Trust, whose Executive Director is a key player in CAVI's Learning Lunch Seminar Series. "CAVI is a real team of practitioners," concludes Bryn; "we want to create the same kind of learning environment in our valley."

Ensuring ISMPs are Outcome-Oriented

The need for a 'course correction' in the way ISMPs are done was flagged on page 68. The Bowker Creek Blueprint and other case studies profiled in this chapter demonstrate how local governments can make the necessary correction.

Implement a New Culture

"The big learning from the Bowker Creek process is the process itself. We have a good model to work with," Jody Watson stated at the Bowker Forum in February 2010.

"I hope that in future we will get to a point where we don't have to develop a specific plan for a watershed.... because we will have changed the culture and the thinking; and how we develop and how we engineer."

"It will all be changed so that natural areas are protected as part of the way we do business. We are not there yet, but everyone is starting to move in that direction. Regionally we may need to do a few more key watersheds to continue that learning and get to a point where it is just the way we do business."



Apply a Knowledge-Based Approach: "In 2001, the Regional District of Nanaimo was the pilot local government for development of the outcome-oriented **Knowledge-Based Approach**. The RDN case study is described in Chapter 5 of the Guidebook. A decade later, the Bowker Blueprint reinforces why we must focus on solutions and outcomes," states John Finnie, CAVI Chair. "When the right people with the right knowledge are involved at the right time to apply *informed judgment* in a collaborative process, the outcome-oriented approach saves time and money."

Why RAINwater Management

Figure 22 captures the evolution of drainage planning in BC over the past 30 years. The importance of Figure 22 is that it embodies the paradigm-shift that is driving the 'ISMP course correction' from an approach that is engineering-centric to one that is holistic, integrated and landscape-based – i.e. **RAINwater Management**.

Focus on Form and Function: "It is important to use descriptions which are linked closely with the objectives and ideas," states Robert Hicks of Metro Vancouver. "Ideally, the right choice of wording will frame the concepts clearly, and provide the terminology with some longevity. Clarity will help with uptake."



"In Germany, for example, it is *Regenwasser* (rainwater) and *Nahenatur Entwässerung* (near natural drainage). In the UK, it is 'sustainable urban drainage systems' (SUDS). Use of these terms has inspired many BC practitioners to focus on function and solution - site level, rainwater, green, integrated, infrastructure, etc."

"For the past decade in Metro Vancouver, we have been considering *rainfall management* rather than *stormwater management*. Rainwater falls on the site. If you manage it on site, then you don't have stormwater runoff," states Ed von Euw, Metro Vancouver Senior Engineer. He has led development of the region's **Integrated Liquid Waste & Resource Management Plan**. "Rainwater is so all-encompassing that it is actually included under all three of our goals and several strategies."



Switch to IRMP: "When we were developing the Guidebook, Ted van der Gulik coined the line on page 1-1 that says '*stormwater is the component of runoff that is generated by human activities*'. We considered the distinction important," recalls Peter Law, Chair. "We also weighed whether the title should be 'stormwater' or 'watershed-based' planning. To provide practitioners with a point of departure that they understood in 2002, we opted for 'stormwater'. The time is now right to make the break from 'ISMP' and instead use '**IRMP**' – that is, **Integrated Rainwater Management Plan**."

from Stormwater Management to RAINwater Management

From TRADITIONAL to

- Drainage Systems
- Reactive (Solve Problems)
- Engineer-Driven
- Protect Property
- Pipe and Convey
- Limited Consultation
- Local Government Ownership
- Extreme Storm Focus
- **Peak Flow Thinking!**



INTEGRATED:

- Ecosystems
- Proactive (Prevent Problems)
- Interdisciplinary Team-Driven
- Protect Property *and* Habitat
- Mimic Natural Processes
- Extensive Consultation
- Partnerships with Others
- Rainwater Integrated with Land Use
- **Volume-Based Thinking!**

Source: Chapter 3, *Stormwater Planning: A Guidebook for British Columbia*, 2002

Rainwater Management: Key Elements of the Transition to an Integrated Approach

Figure 22

Federal Fisheries Perspective

“Almost a decade ago I began representing DFO in dealing with local government and the development community regarding land use issues,” states 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.”

Implement the Course Correction: “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, and what the Metro Vancouver Reference Panel is now telling us. Establish the vision, set the target and then implement.”

“The **Commentary** (refer back to Table 2) was a first step in helping 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. Now we need to go the next step.”

“We have tools such as the Water Balance Model and the Topsoil Primer Set; and we have many on-the-ground examples of how to capture rain where it falls. Municipalities just need to get on with applying the tools and the experience so that they capitalize on opportunities rather than *missing opportunities*.”

Why Beyond the Guidebook: “It helps to look back to understand how we got to here. In 2001, DFO released the 4-page *Urban Stormwater Guidelines and Best Management Practices for Protection of Fish and Fish Habitat*. That document set a direction. By 2007, however, we had concerns about how the document was being interpreted and applied. **Beyond the Guidebook 2007** represents the initial course correction (refer back to p. 44 - 45).”

The Shift from Stormwater to RAINwater

- **2001:** *Urban Stormwater Guidelines and Best Management Practices for Protection of Fish and Fish Habitat*
- **2007:** *Beyond the Guidebook: Context for Rainwater Management and Green Infrastructure in British Columbia*

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 a different kind of ISMP, one that is guided by the ‘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.”

Provincial Government Context

Living Water Smart, BC's Water Plan and the Green Communities Initiative must be viewed as an integrated package. Living Water Smart presents the vision, and the Green Communities Initiatives provides enabling tools to achieve the vision.

Implementation Framework: "The fact one has a PLAN does not mean one has implementation," states Glen Brown. "An ISMP that produces an unaffordable price-tag can have an unintended consequence: paralysis and/or inaction."

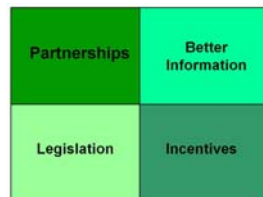


"A local government does not require an ISMP for it to implement green infrastructure practices. When you know something needs to be done (think of the Bowker Blueprint), and there are easy first steps, jump in....get started....even if it is incremental."

"What a local government does need is that its engineering, planning, finance and operational folks work together. That collaboration is the beginning of implementation."

"If one goes back 10 years, there was a void of policy and legislation. This led us down an educational path as the logical alternative," states Glen Brown. "We took the Guidebook, which is a document, and we moved it to implementation. The educational path takes time; it is incremental; it takes effort."

"Now, the Green Communities Initiative provides a comprehensive framework for helping local governments in BC create **integrated communities**. The framework has four elements; and these elements encompass plans and strategies that complement and support Living Water Smart."



"The Guidebook and Beyond the Guidebook are elements of the Green Communities Initiative. Beyond the Guidebook 2010 is about strategies, tools and resources that will help communities move from awareness to implementation."

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 Living Water Smart targets. Those who are proactive and show leadership are the ones who are being rewarded," continues Glen Brown.

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

Grants Foster Innovation & Integration

"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 goals of both the Green Communities Initiative and Living Water Smart."

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

Move to a Level-of-Service Approach: "Money – it should be about how to get the most value out of every dollar spent. Too often, thinking stops after the capital investment is made. Yet everyone needs to be thinking in terms of life-cycle costs, including future recapitalization of the investment. This is not normally considered in traditional infrastructure decision-making."

"And when you think about it, how often can an 'engineering solution' be described as a band-aid, especially when it reflects an end-of-pipe way of thinking? A 'design with nature' solution, on the other hand, deals with the cause of a problem; and is usually the outcome of interdisciplinary and interdepartmental collaboration and interaction."

"When you think about it some more, you realize we really should be talking about *level-of-service*. What level do you wish to provide, and what level can you afford. The **Commentary** (refer back to Table 2) envisions a level-of-service approach to setting watershed-specific runoff targets. It identifies the questions that should be asked when evaluating the acceptability of targets. From the stream health perspective, for example, appropriate and effective green infrastructure is a way to increase the level-of-service."

Implementing the Course Correction

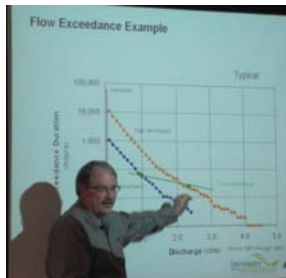
As highlighted in the previous sections, the unintended consequences of ISMPs completed to date have drawn attention to the need for a course correction in the way ISMPs are developed.

Coupled with the framework presented in Table 1, the intent of this section is to provide local governments and practitioners with guidance for implementing the necessary course correction. This guidance is organized in three theme areas:

- Are watersheds and streams all the same? Should a single process or prescription be applied to all?
- Is there too much engineering in the ISMP process?
- A new factor for consideration

Re-focusing ISMPs on watershed outcomes will help communities get the best return on their investment of scarce resources.

Should a Single Process be Applied to All: “Not all streams and watersheds are the same; nor should all targets and initiatives be established with a standardized prescription. What is appropriate for a stream and watershed on the North Shore may not be appropriate in Surrey, or vice versa,” observes Jim Dumont.



“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 ISMP process should address the uniqueness; and should provide recommendations and strategies that recognize those unique features.”

Is There Too Much Engineering in ISMPs: “We can see that the intent of the current ISMP Template is to create a plan for the future for individual watersheds. Yet this guiding objective appears to have been flavoured through the inherent bias of engineers.”

“On the one hand, several important engineering considerations are being addressed as part of this current ISMP process. On the other hand, some of the aspects that are being examined in detail would be best left until later. This would allow the vision of the watershed to be established with less cost.”

“An example of analysis that can be deferred would be the pipe-by-pipe evaluation of capacity, and potential costs associated with applying new drainage standards to increase the level of protection and to allow for potential impacts resulting from our changing climate. When we assess 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 ISMP process?”

“Application of new standards will almost certainly involve upgrading a great proportion of the existing drainage infrastructure. It may be questioned as to whether there is a value in this or whether a different set of questions might result in a lower cost option. This should not be within the realm of creating a vision of the future watershed; rather it should be an issue for operations groups of the municipalities.”

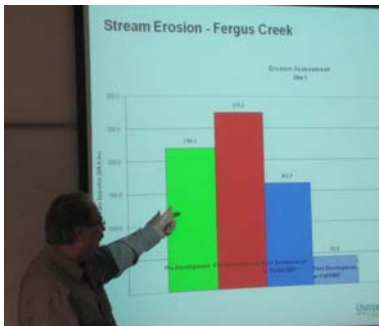
“A further argument that this engineering assessment may reasonably be postponed until after the vision of the watershed is clear is the simple example of the rainfall spectrum. Watershed and stream health are most greatly affected by the small rainfalls, while the flooding in urban areas is a result of very large and infrequent events. It is most appropriate to review the effect of small rainfalls on the stream and leave questions of flooding to a more appropriate time. This would allow a very large reduction in the cost of undertaking and implementing an ISMP,” concludes Jim Dumont.

A New Factor for Consideration: “One factor that is going unnoticed in the ISMP Template involves the streams and the processes that affect them, combined with the timescales over which change is wrought.”

“It should be readily apparent that streams are not static; in fact they experience constant change. While a natural stream will undergo a regular and reasonably predictable change, it will maintain its basic characteristics.”

“A stream that is affected by urban development will change dramatically and will continue to alter its characteristics until they become stable in response to the new hydrology of the watershed.”

Timeframe for Change: “This path to stream stability can take several decades to reach equilibrium and while that form may be more stable it will be different than the original, and may have different habitat values. The generally accepted view is that the altered stream will have habitat of a lower aquatic value.”



“Such adverse changes can be anticipated with our current scientific knowledge and we can quantify some of the driving forces and we can develop mitigation methods that can be evaluated using quantifiable methodologies.”

“If we examine the timeframe of the impact we may see that most urban streams are in the midst of this change and we may not see their final shape for many years. Our planning of a future watershed vision should recognize this and provide an allowance to create a more appropriate and achievable set of objectives.”

“This should be considered in the ISMP process, with a recognition that the streams you see are in a state of change and will not remain as they are, no matter how much we may desire this,” concludes Jim Dumont.



Lessons Learned from the Bowker Process:

The Bowker Creek Initiative Steering Committee has identified seven distinguishing characteristics that capture the essence of their lessons learned and experience gained. These are listed below in order of significance:

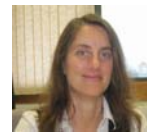
1. Community Values Drive BCI and Blueprint
2. Coordinator Role is Crucial
3. Outreach – A Powerful Tool
4. Commit to the Vision
5. Integrate Watershed & Creek Actions
6. Regional Alignment Starts with a Regional Team Approach
7. Blueprint Allows for Climate Change

Commit to the Vision: “Looking back, the turning point occurred in November 2008 when the steering committee brought in a third party to facilitate the internal conversation. That allowed us all to take a step back and look at the big picture instead of getting stuck in the details,” recalls Jody Watson, BCI Chair.



“Out of this renewal process came a reaffirmation and a recommitment to the Bowker Creek Vision by all the partners. At the same time, the partners developed a Members Agreement to work cooperatively. This agreement created a better understanding of the desires, constraints, and job realities of everyone around the table. The US versus THEM way-of-thinking changed to the WE paradigm. The players around the table realized that they can help each other.”

“The Saanich, Victoria and Oak Bay portions of the Bowker Creek watershed are very different. Yet, it is essential that we be supportive of each other and work as a team,” continues Adriane Pollard. “When we get together, we talk about what part can we all play in reaching a mutual goal, whether it involves funding, expertise, or facilitation.”



“Implementing the Blueprint is all about shared responsibility. We often need to remind ourselves to move beyond the attitude that we are not involved simply because something is not within our boundaries. The message is that WE all want this done. So we must help each other in any way that we can.”

Mission Possible: “A Top Down Bottom Up Strategy”

“When convening for action, we create a picture of the future that we want,” emphasizes Eric Bonham. “By bringing together local government implementers in neutral forums, we are enabling 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.”



“Never forget that examples inform policy decisions by elected representatives. So provide them with commonsense examples that make it easy for them to move from awareness to action.”

Creating Our Future

When speaking at CAVI and other events, Eric Bonham tells an anecdote about John Muir, the Scottish-born visionary who was responsible for creation of the national parks system in the United States in the late 19th century.

“Everything is connected. This is the approach we are taking with CAVI. We are trying to connect people...up and down Vancouver Island. We are talking about creating our future.”

“John Muir managed to get the ear of President Teddy Roosevelt. He took him to the top of Mount Yosemite where they discussed the need for park protection. The point of the story is that major breakthroughs happen when you have decision-makers working with visionaries. John Muir represented the grass-roots and the President was the senior policy maker in the United States.”

CAVI - Mission Possible
“A top down bottom up strategy”

“When we try to pick out anything by itself, we find it hitched to everything else in the universe.”
John Muir

President Teddy Roosevelt & John Muir
“Decision Maker. Visionary”
At Yosemite National Park in 1903

Connect to the Landscape

“The vision of the Real Estate Foundation is that we will be a pivotal connection in making land use knowledge and practice in British Columbia a model for the world,” states Karin Kirkpatrick, Executive Director. “The Foundation’s hands-on role with Convening for Action in British Columbia has allowed us to frame this challenge for land and water practitioners: *What is our land ethic, and how can we view the context differently?*”



Grant Program: “One of our goals is to influence practitioners to be more responsible. This means they will be informed and accountable. Connecting people to the landscape is important. Our mission is to change the *land ethic* for the better. The Foundation can facilitate, influence and/or reward desired outcomes through our grant program.”

“In 1985 the Province enacted legislation which established the Real Estate Foundation as a non-profit corporation. We receive interest from ‘unassigned’ trust deposits held by real estate agents and we use the funds to provide grants for activities related to real estate and land use.”

Research and Solutions: “In our unique role as a funder of organizations doing good work related to land use, we have a bird’s eye view of what is happening in BC with respect to land use issues and projects. We also have access to new research, case studies, and other fresh information on innovative and unique solutions.”

“We see our role as being able to make connections and to share and promote the research and knowledge that we have access to. A prime example is the work that Tim Pringle has done to help local governments view the Vancouver Island context differently: *One Market – Cobble Hill to Campbell River.*”

Changing the Land Ethic: “When the Foundation refers to the **New Business As Usual**, we mean that ‘design with nature’ will be everyday practice...and we will move to an approach that is cohesive, concerted and leads us to sustainability,” concludes Karin Kirkpatrick.

Developing a Shared Vision

“To reach consensus on a shared vision of what is desirable and achievable for watershed protection or restoration, people need a picture of what a stream corridor could and/or should look like,”



states Peter Law, Chair of the Steering Committee that developed the Guidebook. “Often, the visioning process boils down to whether or not a stream corridor will have a functioning aquatic ecosystem.”

A Communication and Decision Tool: Figure 23 on the next page is reproduced from the Guidebook and captures the evolution of drainage planning philosophy over the past 50 years. In 1998, this graphic and the concept of 20-yr and 50-yr visions helped the Councils for the cities of Burnaby, Coquitlam, Port Moody and Kelowna make policy choices.

“The graphic translates scientific findings on the impact of land use change into a decision-making tool for green infrastructure goals and objectives. It illustrates the consequences for stream corridor ecology of various attitudes towards rainwater management. It provides stakeholders with clear visual choices regarding desired ISMP outcomes,” explains Peter Law.

Reason for Optimism: “When the Province released the Guidebook in 2002, we thought we would be doing well if we could just *Hold the Line*. We hoped we might have enough successes after 20 years that maybe, just maybe, we would then *Improve Conditions* in the decades that followed. Well, it is 2010 and we have exceeded our own expectations. What was a dream in 2002 may now in fact be achievable.”

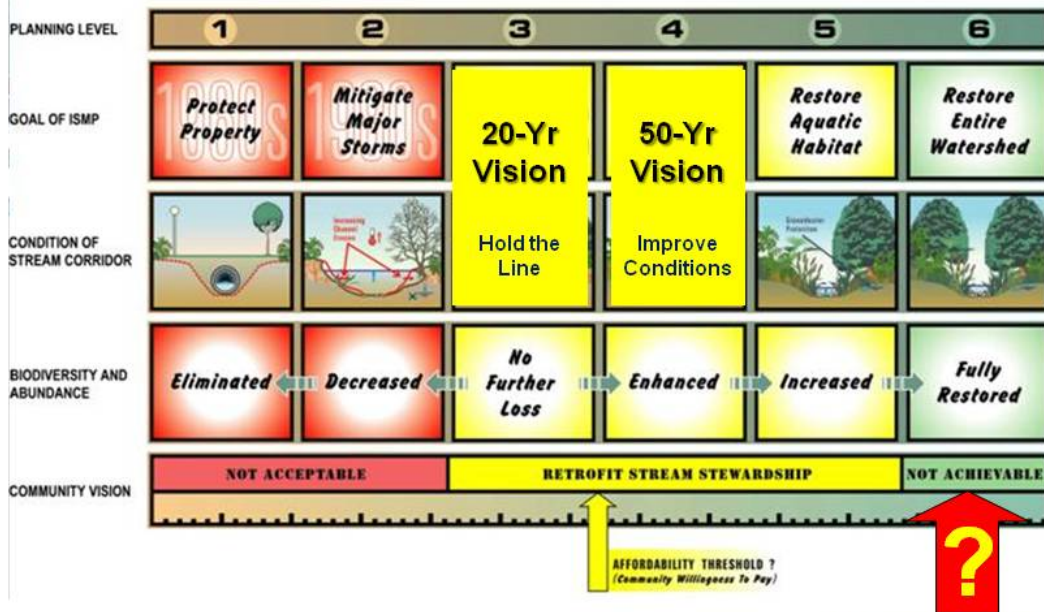
“After reflecting on all the stories told in *Beyond the Guidebook 2010*, I am just blown away at how the original Stormwater Planning Guidebook really foreshadows how this subject has moved forward over the past 10 years.”

“We coined the acronym **ADAPT** in the 2002 Guidebook, and I am pleased to see how so many sectors of the land development industry (from local government planners to design engineers to backhoe operators) in British Columbia have taken up the challenge to find more sustainable solutions in developing land in a way that is not harmful to the environment. I am proud to have been part of this team approach to finding integrated solutions,” concludes Peter Law.

ADAPT is the acronym for five guiding principles of integrated rainwater management. Refer to Figure 24 on page 97.

*What we believed to be 'unachievable' in 1998
may in fact now be within our grasp*

ALTERNATIVE VISIONS FOR THE LONG-TERM ENVIRONMENTAL HEALTH OF STREAM CORRIDORS
Conceptual Framework for Selection of ISMP Level



Now achievable?

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

A Science-Based Communication & Decision Tool

Figure 23

ADAPT

- 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

Source: Executive Summary (pages ES-3 through ES-6),
Stormwater Planning: A Guidebook for British Columbia, 2002

Guiding Principles of Integrated Rainwater Management

Figure 24