



the partnership  
for water sustainability in bc

Waterbucket eNews on November 21, 2023

<https://waterbucket.ca/wscblog/>

# **Living Water Smart in British Columbia:**

***Enhancing biodiversity  
through green infrastructure  
solutions in Surrey***

## Note to Reader:

Waterbucket eNews<sup>1</sup> celebrates the leadership of individuals and organizations who are guided by the vision for [Living Water Smart in British Columbia](#)<sup>2</sup>.

The edition published on November 21, 2023 featured Rémi Dubé of the City of Surrey. In the 2000s, he made significant contributions to the evolution of rainwater management and green infrastructure in British Columbia. A noteworthy contribution is the Fergus Creek watershed plan which was the genesis for Surrey's Biodiversity Conservation Strategy and Development Cost Charges Bylaw.

The umbrella for Partnership initiatives and programs is the [Water Sustainability Action Plan for British Columbia](#)<sup>3</sup>. In turn, the Action Plan is nested within [Living Water Smart, British Columbia's Water Plan](#).



**Cover Image Credit:** photo by Carrie Baron, formerly with the City of Surrey and a *Lifetime Member* of the Partnership for Water Sustainability

<sup>1</sup> <https://waterbucket.ca/wscblog/>

<sup>2</sup> [https://waterbucket.ca/wcp/wp-content/uploads/sites/6/2017/11/livingwatersmart\\_book.pdf](https://waterbucket.ca/wcp/wp-content/uploads/sites/6/2017/11/livingwatersmart_book.pdf)

<sup>3</sup> <https://www.waterbucket.ca/cfa/sites/wbccfa/documents/media/81.pdf>



## One-Minute Takeaway

“From an urban fabric perspective, between the Agricultural Land Reserve and our watercourses, the city would be quite a bit different if not for them. You drive through Surrey and there is an environmental sense to it despite the density in the City Centre.”



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### Enhancing biodiversity thru green infrastructure solutions

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When Rémi Dubé joined the City of Surrey in 2002, he brought his skillset as an experienced water resources engineer to bear as manager of the drainage section responsible for land development planning.

In the 2000s, his drainage leadership allowed Rémi Dubé to make significant contributions to the evolution of rainwater management and green infrastructure. He framed the nature of the paradigm-shift with this statement:

**“Surrey is moving beyond green infrastructure pilot projects to a broader watersheds objectives approach” (2009)**

### Lands for Green Infrastructure Network

From that bold leap forward emerged the framework for Surrey's **Biodiversity Conservation Strategy**. The genesis for the strategy was the green solutions concept in the Fergus Creek plan. With adoption of the Biodiversity Strategy in 2014, Surrey established a Canadian first.

The next bold leap was the **Development Cost Charges Bylaw for Biodiversity Conservation** in 2019. This funds land acquisition for the Green Infrastructure Network.



## Biodiversity Conservation Strategy

DIAMOND HEAD CONSULTING - JANUARY 2014

The Executive Summary of the **Biodiversity Conservation Strategy** includes a defining statement that has for a decade provided guidance for watershed-based planning and actions that ultimately create a *"watershed health legacy"*.

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### Leaders by example, without fanfare

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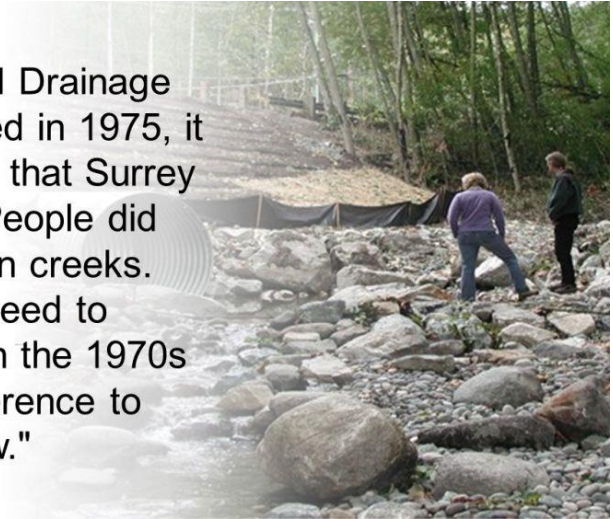
"At the time, all this stuff was happening when we were doing our regular jobs. We were quite jealous of how other municipalities were highlighting what they were doing," recalls Rémi Dubé.

"If it was not for the Partnership for Water Sustainability and the waterbucket.ca website, we would not have taken the time to report on what we were doing! We were just doing the job. It was always, one day we should write about it. Really!"

"I remember thinking if we could just write this stuff down. And the only place that we did it was through the Partnership. And once in a while we would go to a conference and present."

## Editor's Perspective by Kim A Stephens

"When the Natural Drainage Policy was adopted in 1975, it must have helped that Surrey had lots of land. People did not have to build in creeks. Formalizing that need to preserve creeks in the 1970s made a huge difference to what we have now."



The "story behind the story" weaves quotable quotes by Rémi Dubé to paint a picture. My hope is that readers learn from this "look back to see ahead" storyline. This preview is extracted from:

### **Create Liveable Communities and Protect Stream Health in the Metro Vancouver Region: *Moving Along the Green Infrastructure Continuum***

We will publish this legacy resource early in 2024. The story begins in 1997 with passage of the [Fish Protection Act](#). That is what changed everything.

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## **Fish Protection Act was a call to action and Surrey led the way in Metro Vancouver**

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The Fish Protection Act was a response to the "salmon crisis" in the 1990s. Listing of Chinook salmon as a threatened species in Puget Sound was a galvanizing action for cross-border collaboration with British Columbia. We learned from each other.

Applied research by Richard Horner and Chris May at the University of Washington at the request of Puget Sound local governments gave us a science-based understanding of the correlation between land development and consequences for salmon.

With that foundational understanding as a springboard, in British Columbia we went back to the basics to tackle the root cause of the problems which result when drainage water is intercepted and put into pipes. That was the genesis for the [Water Balance Methodology](#)<sup>4</sup>.

In the Metro Vancouver region, the City of Surrey stepped up its game to lead by example. Surrey staff were already building on two decades of experience in pioneering new approaches. The transformational Natural Drainage Policy of 1975 gave them a mandate and the salmon crisis compelled action.

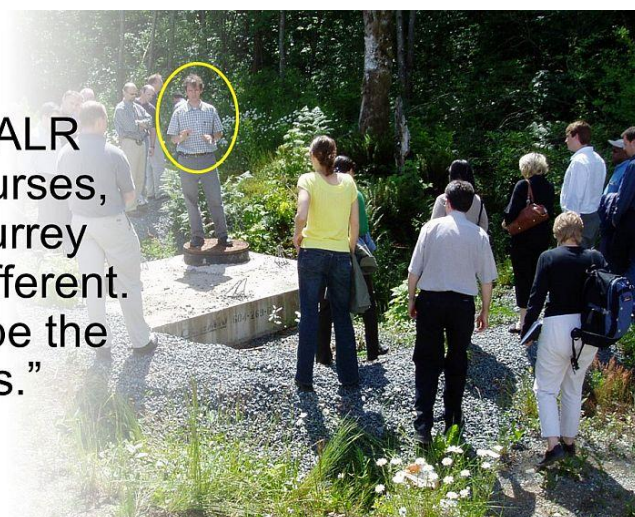
## A message of hope

One of my favourite memories of Rémi Dubé in action was in 2007 when we represented British Columbia on a cross-border panel at a conference in Seattle. There was a despair in Puget Sound. But we had a good news story.

Rémi had a [message of hope](#)<sup>5</sup> when he explained what Surrey was doing. Our efforts in the Lower Mainland region to integrate rainwater management and land use is what differentiated us from Washington State.

“Without the ALR and watercourses, the City of Surrey would feel different. It would not be the place that it is.”

Rémi Dubé



<sup>4</sup> [https://waterbucket.ca/wp-content/uploads/2012/05/Primer-on-Water-Balance-Methodology-for-Protecting-Watershed-Health\\_February-2014.pdf](https://waterbucket.ca/wp-content/uploads/2012/05/Primer-on-Water-Balance-Methodology-for-Protecting-Watershed-Health_February-2014.pdf)

<sup>5</sup> <https://www.waterbucket.ca/cfa/sites/wbccfa/documents/media/339.pdf>



## STORY BEHIND THE STORY:

### Enhancing biodiversity through green infrastructure solutions in Surrey *- a conversation with Rémi Dubé*

“Without the ALR  
and watercourses,  
the City of Surrey  
would feel different.  
It would not be the  
place that it is.”

Rémi Dubé



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## Biodiversity Conservation Strategy

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“Despite the population density that we have had to accommodate, and the ongoing growth due to the demand for housing, we have to set land aside for community liveability. The [Biodiversity Conservation Strategy](#)<sup>6</sup> is pretty much a reflection of that need,” comments Rémi Dubé

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*“The City of Surrey has always run a lean operation. It is easy to know what is going on,” comments Rémi Dubé. “We are small enough that we can talk to each other and ask, how can we enhance stream corridors to maximize the biodiversity value they bring?”*

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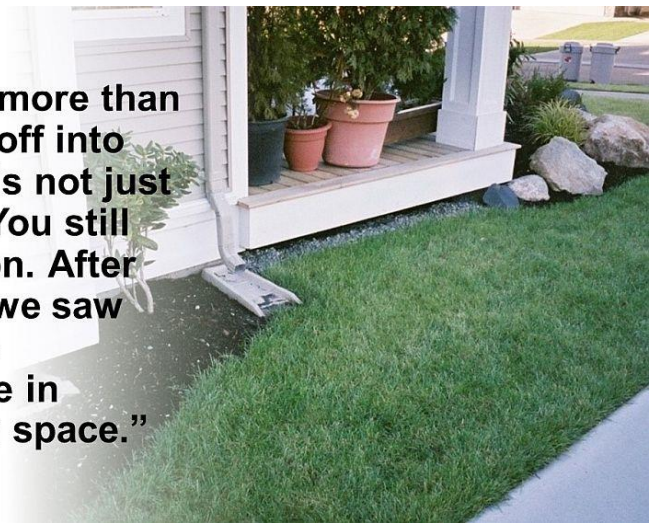
*“Surrey’s Development Cost Charges Bylaw for the Biodiversity Strategy (2019) did not happen overnight. The framework for the strategy came out of the Fergus Creek watershed plan and the vision for green solutions many years before in 2006.”*



### Strategy provides guidance for watershed actions

“My thinking about neighbourhood concept planning has been shaped by the look-and-feel of East Clayton as it was built compared to what we envisioned with the lofty goals for a sustainable community.”

**“Hydrology is more than infiltrating runoff into the ground. It is not just about gravel. You still need vegetation. After East Clayton, we saw the need to do something else in terms of green space.”**



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<sup>6</sup> <https://www.surrey.ca/renovating-building-development/land-planning-development/environmental-protection/biodiversity>



"There are many side benefits associated with creeks beyond moving water from A to B."

"You have to take that extra step in terms of land use planning. The intent of the Development Cost Charges Bylaw is to help acquire lands in the corridors that are identified in the Biodiversity Conservation Strategy."

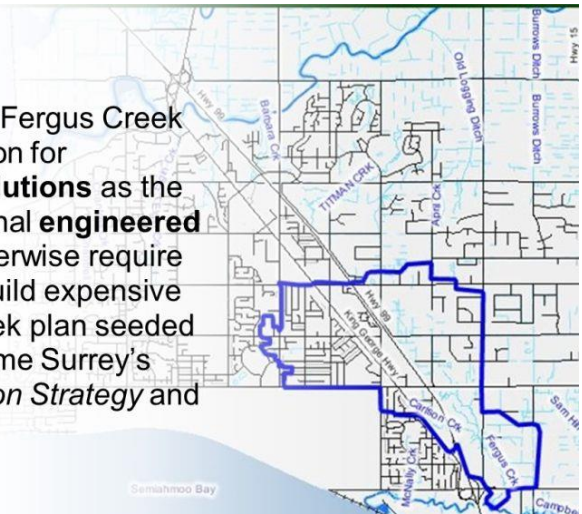
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## Fergus Creek: a plan with green solutions

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"Fergus Creek was the first of the new generation of watershed plans in the City of Surrey. We wanted a plan that would actually facilitate changes in how land is developed. In other words, what the watershed will look like in future should drive the approach to rainwater management."

Completed in 2006, the Fergus Creek plan introduced the vision for implementing **green solutions** as the alternative to conventional **engineered blue solutions** that otherwise require large areas of land to build expensive ponds. The Fergus Creek plan seeded the two ideas that became Surrey's *Biodiversity Conservation Strategy* and *Biodiversity DCC*.



"The Fergus Creek plan showed why and how contiguous greenways make rainwater management easier and provide the land we need to actually achieve multi-purpose outcomes."

["When Surrey hosted the second in the 2006 Metro Vancouver Showcasing Green Infrastructure Innovation Series, we said that Fergus Creek is going beyond what is in the BC stormwater planning guidebook. The phrase stuck."

## How to implement more effective green infrastructure

"Fergus Creek was the inspiration for the Partnership's Beyond the Guidebook Initiative. At the launch event in 2007, Jim Dumont and I led a mini charrette for engineers and planners."

"The group exercise explored scenarios for green infrastructure implementation in the Grandview Heights Neighbourhood in the Fergus Creek watershed."



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## Getting green infrastructure built right

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"In 2008, Council adopted the Surrey Stormwater Drainage Regulation and Charges Bylaw. Clause 9 in Part 5 gave us the language we needed to establish broader watershed objectives. The City had moved beyond pilot projects!"

"Getting green infrastructure built right - that was the theme for a regional forum that Surrey hosted in early 2009. We designed the forum to start a dialogue between policy-makers and project implementers. The program was built around the HOW question."

## It is a shared responsibility


"HOW will the City of Surrey get green infrastructure built right; and how will a consistent regional approach be achieved in Metro Vancouver? We approached these questions from a shared responsibility perspective."

"Regulators, developers and designers all need to understand the goal and their roles and responsibilities."




"Regulators, developers and designers all need to understand the goal and their role. Once we know what we want our watersheds to look like, the next step is to decide what the tools are that will get us there. Watercourses really do drive a lot of what we do in Surrey. "

"The number of natural resource interaction events that we have in Surrey is pretty exciting. We still have salmon runs, for example. It is fun for residents. Without the ALR and watercourses, the city would feel different. It would not be the place that it is," concludes Rémi Dubé.



### Watershed-Based Approach

- Need to understand the watershed
  - streams
  - opportunities/constraints
  - vision
- Need to go beyond peak flow conveyance and address hydrologic regime.
- Need to communicate vision (objectives/targets).
- Must have a process to implement plan





## APPENDIX A

# **A window into the green infrastructure journey in the Metro Vancouver region:**

A conversational interview with former Rémi Dubé provides context on moving beyond pilot projects



Alignment Around a Shared Mission

Biodiversity Conservation Strategy:  
*guidance for watershed actions*

Beyond the Guidebook Initiative

## Remi Dubé, Director of the Building Division, City of Surrey (since 2002)

### **Leaders by example, without fanfare**

*"At the time, all this stuff was happening when we were doing our regular jobs. We were quite jealous of how other municipalities were highlighting what they were doing. If it was not for the Partnership and the waterbucket.ca website, we would not have taken the time to report on what we were doing!"*

*"We were just doing the job. It was always, one day we should write about it. Really!"*

*"I remember thinking if we could just write this stuff down. And the only place that we did it was through the Partnership. Or SILG. And once in a while we would go to a conference and present."*

### **Moving Beyond Pilot Projects**

Rémi Dubé joined the City of Surrey in 2002. He brought his skillset as an experienced water resources engineer to bear when he was appointed manager of the drainage section responsible for land development planning. During his first decade with the city, he played a leadership role within multiple Partnership-led initiatives.

Rémi Dubé was a founding member of the inter-governmental partnership that in 2003 developed and evolved the Water Balance Model as an extension of [Stormwater Planning: A Guidebook for British Columbia](#). Later in the decade, he represented Surrey on the Green Infrastructure Partnership when he and Susan Rutherford co-developed the Topsoil Primer Set as an action item flowing from the [2009 Water Balance & Green Infrastructure Forum](#) hosted by Surrey.

Throughout the 2000s, and this is a landmark contribution, Rémi Dubé initiated a series of case studies that allowed the Partnership and Jim Dumont to evolve the [Water Balance Methodology](#). In fact, the Fergus Creek watershed plan resulted in a breakthrough in approach that is the genesis for the [Beyond the Guidebook Initiative](#). It was Rémi Dubé who in 2009 framed the paradigm-shift that "Surrey is moving beyond green infrastructure pilot projects to a broader watersheds objectives approach".



*"The framework for the Biodiversity Conservation Strategy came out of the ISMP process. There was a lot of talk about setting aside green land for biodiversity. But we did not call it that at the time. When we did the Fergus Creek plan and Grandview Heights 5 Neighbourhood, that is where the idea really picked up speed. We needed something better than just watercourses. When I look back, without Fergus Creek it would have been difficult."*

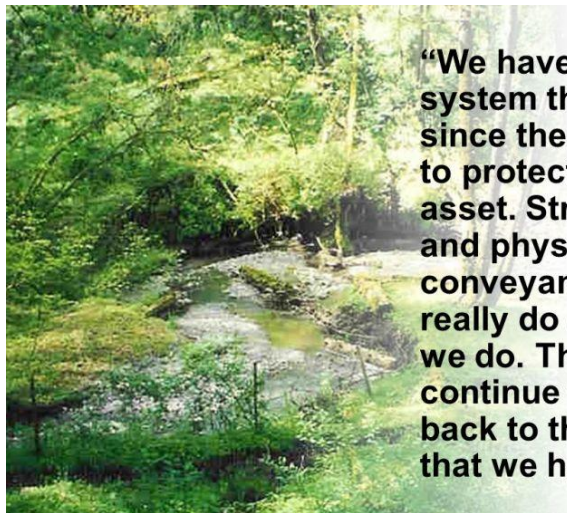
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## Alignment Around a Shared Mission

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Although the City of Surrey is a large organization serving a large population, it has always run a lean operation. Even though an individual may wear a certain title, there are people in the organization who have relevant experience and memories are there to help.

“It is easy to know what is going on,” comments Rémi Dubé. “We are small enough that we can talk to each other and ask questions. It is good to know where things are heading. I imagine that it all comes down to the fact that we have watercourses all over Surrey.”



**“We have a natural drainage system that we have relied on since the 1970s and we want to protect it because it is an asset. Streams are a natural and physical asset for conveyance. Watercourses really do drive a lot of what we do. The work that city staff continue to do always goes back to the natural resource that we have inherited.”**

### Urban fabric perspective

“Whether it is parks or recreation, they are really leveraging that asset that has been created over decades. Whichever department is responsible for which section of which stream in which watershed protects its function.”

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*“The number of natural resource interaction events that we have in Surrey is pretty exciting. We still have salmon runs, for example. It is fun for residents. Without the ALR and watercourses, the city would feel different. It would not be the place that it is.”*

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**“From an urban fabric perspective, between the Agricultural Land Reserve and the watercourses, the city would be quite a bit different if not for them. Between those two assets, you drive through Surrey and there is an environmental sense to it despite the density in the City Centre. You do not have to go far. It is a different history than in the city of Vancouver!”**



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## Biodiversity Conservation Strategy - *guidance for watershed actions*

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### **Commitment to a shared mission**

*“It comes back to the people who you hire. In Surrey, a group of people is here to make it happen! It is true. You look around and you ask yourself, who would fit in with what we are trying to do here. And you ask, who can make it work in Surrey?”*

*“You tend to find people who are likeminded because you have a thought on where you want to go. And, you think, this person agrees with me, I like this person. Let’s go!”*

*“The DCC Bylaw for the Biodiversity Strategy did not happen overnight. It was years in the making to deliver it and working with elected officials to say, this is the right thing to do, and them endorsing that.”*

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“When the [Natural Drainage Policy](#) was adopted, it must have helped that Surrey had lots of land. People did not have to build in creeks. Formalizing that need to preserve creeks in the 1970s made a huge difference to what we have now,” continues Rémi Dubé.

“My thinking about neighbourhood concept planning has been shaped by the look-and-feel of East Clayton as it was built compared to what we envisioned with the lofty goals for a sustainable community.”

“Despite the population density that we have had to accommodate, and the ongoing growth due to the demand for housing, we have to set land aside for community liveability. The [Biodiversity Conservation Strategy](#) is pretty much a reflection of that need.”

“We could try to do what we could using infiltration to maintain the water balance, but at some point you still need vegetation. Hydrology is more than infiltrating runoff into the ground. It is not just about gravel. We needed to do something else in terms of green space.”

“Aerial photos of certain neighbourhoods impressed that upon us. If it was not for those key watercourses that we were protecting, it would not be the same. You have to take that extra step in terms of land use planning. When we did the Fergus Creek plan and Grandview Heights 5 Neighbourhood, that is where the idea really picked up speed.” **Figure B1** is context for the Fergus Creek vision for *green solutions*.

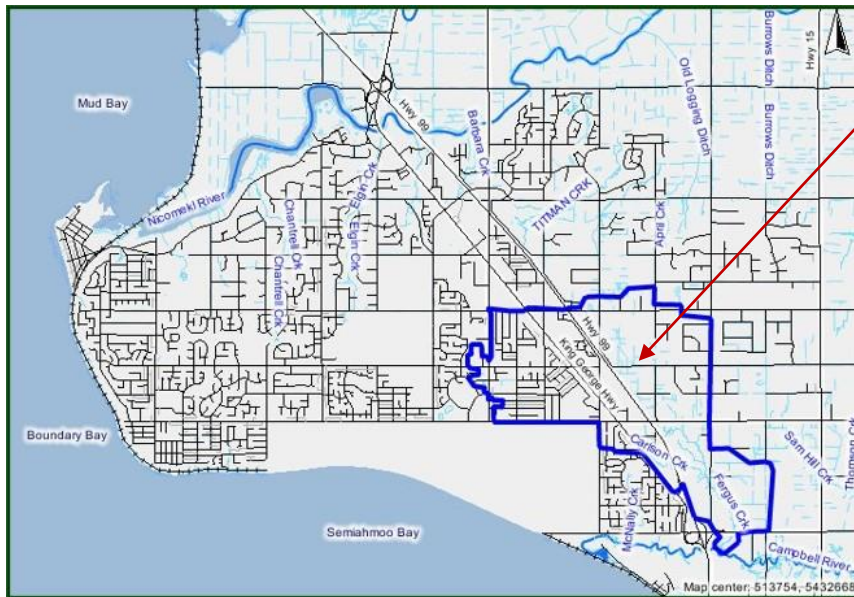
### **Development Cost Charge (DCC) Bylaw for Biodiversity**

The Biodiversity DCC Bylaw for acquiring and enhancing land in stream corridors has been in place since 2019. Surrey is the only municipality that has one.

“The work to create the DCC for biodiversity was initiated many years before 2019. By then, there was still some convincing to do. But people had pretty well committed to it. There was a sense that: *we cannot say NO now, we have to commit to it, we have to do it based on the work done previously*. It would be a lot harder to initiate something like that in 2023. It would not have the same level of support.”



## Figure B1 – Fergus Creek Plan



Completed in 2006, the Fergus Creek plan introduced the vision for implementing **green solutions** as the alternative to conventional engineered **blue solutions** that otherwise require large areas of land to build expensive ponds.

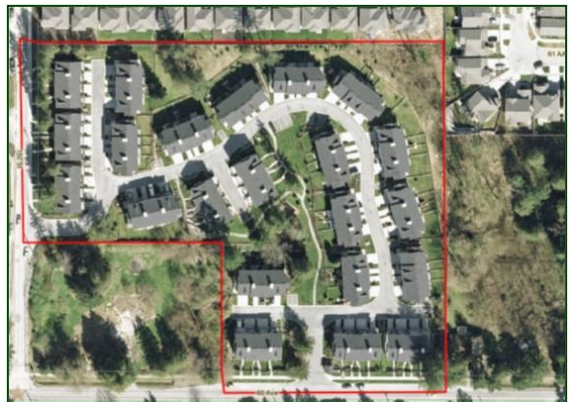
The Fergus Creek plan seeded the two ideas that became Surrey's **Biodiversity Conservation Strategy** and **Biodiversity DCC**.

Also, the Fergus Creek plan was the pilot for the Partnership's **Beyond the Guidebook Initiative**.



LEFT: What Surrey got in East Clayton  
(10 units per acre and 70% impervious area)

BELOW: What Surrey wanted in Fergus Creek  
(14 units per acre and 55% impervious area)



"Jim Dumont provided the City with a vision of what could be accomplished on the ground through a pragmatic approach that is under-pinned by a design with nature philosophy. The City bought into that vision."

Remi Dubé, engineer, 2006

"Now that Jim Dumont has shown us how a greener built environment can in fact be achieved, a challenge is how to acquire land for contiguous greenways that achieve multi-purpose outcomes."

Judy McLeod, planner, 2006

"The numbers show that it would be far more effective to utilize 10% of the watershed for multi-purpose greenways than to dedicate 5% or 6% to traditional single-function detention ponds."

Jim Dumont, visionary, 2006



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## Beyond the Guidebook Initiative

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In the 2000s, his drainage leadership role at the City of Surrey allowed Rémi Dubé to make significant contributions to the evolution of rainwater management and green infrastructure. **Figure B2** provides a broad-brush picture of the part he played in leading by example plus delivering Partnership events during the years 2002 through 2010.

### Fergus Creek: a plan with green solutions

“Fergus was the first of the new generation of ISMPs,” recalls Rémi Dubé. “Our goal was to avoid a cookie-cutter approach that too often is an outcome of this type of multi-year program. Jim Dumont rose to the innovation challenge by developing a watershed plan that would actually facilitate changes in how land is developed or re-developed.”

“Jim Dumont’s focus is on the analytical tools that produce the numbers that make the case for innovation. There is a need for a new approach to hydrologic design, he advocated in the mid-2000s. So, Fergus Creek became the pilot for a runoff-based approach because duration of discharge links directly to stream health.”

“In 2006, when Surrey hosted the second in the showcasing innovation series, we said that Fergus Creek is going beyond the guidebook. The phrase stuck. Fergus led to the [Beyond the Guidebook Initiative](#).”

“Jim also maintained that what the watershed will look like in future should drive the approach to rainwater management. In developing the Fergus Creek plan, he showed why and how contiguous greenways make rainwater management easier and provide the land we need to actually achieve multi-purpose outcomes.”

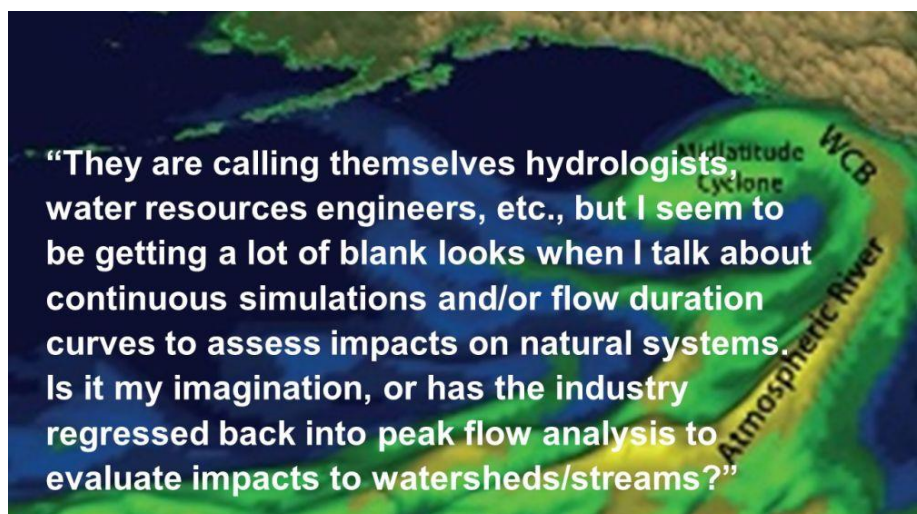
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#### CHANGING CLIMATE & HYDROLOGIC INSTABILITY:

*The risks are too high, and the margins for error too small, to view water and watersheds only through narrow technical lenses.*

This quote by Rémi Dubé was an observation he made in 2017 when he reflected on the state of drainage practice.

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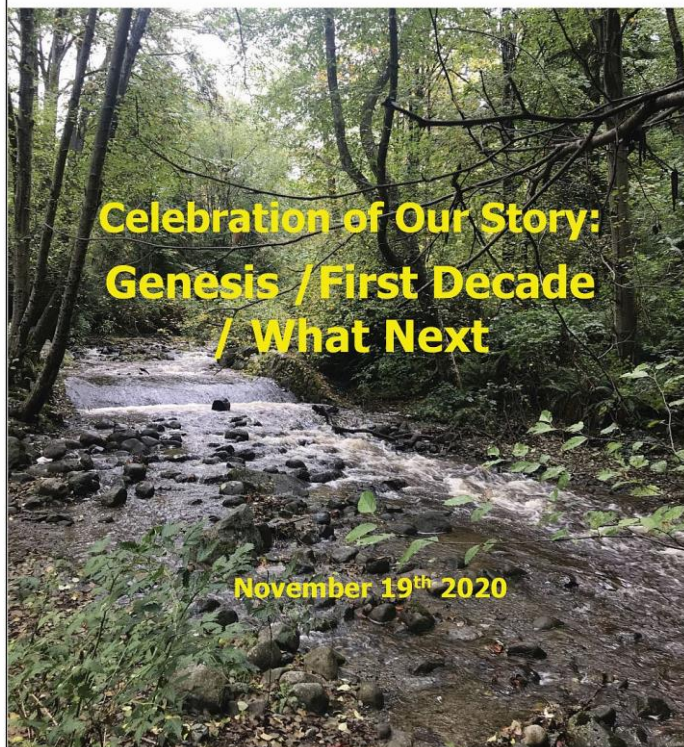


**Figure B2 – Surrey built on and went *Beyond the Guidebook***

Year	Event	Context
2002	Inaugural meeting of the intergovernmental Water Balance Model Partnership	Surrey stepped up as a founding partner, with Rémi Dubé designated as the City's representative on the technical advisory group that then guided initial development of the tool as an extension of <i>Stormwater Planning: A Guidebook for BC</i> , and thus support a performance target approach.
2004	Water Balance Forum: A Natural Systems Approach to Rainwater Management	Surrey hosted the first Water Balance Model Forum in the region. Rémi Dubé explained their East Clayton experience to showcase how the water balance approach had been applied, what the results of performance monitoring revealed, and the lessons learned during implementation.
2006	Showcasing Green Infrastructure Innovation in the City of Surrey	Rémi Dubé led the Surrey team that told the stories of East Clayton, Campbell Heights and Fergus Creek pioneer experience, thus demonstrating Surrey leadership in proactively implementing a <i>design with nature</i> approach to green infrastructure practices within the region.
2007	Rainwater Management and Green Infrastructure: Going Beyond the Guidebook	Surrey played a central role in the provincial seminar that launched the <i>Beyond the Guidebook Initiative</i> . Rémi Dubé and Jim Dumont led the Fergus Creek design charrette that organized participants into interdisciplinary teams to help Surrey resolve "how to do it" implementation issues.
2007	Transboundary Water Resources of Washington State and British Columbia	Rémi Dubé and Kim Stephens represented BC on a cross-border panel at an international conference in Seattle, explained how the Fergus Creek plan informed the <i>Beyond the Guidebook Initiative</i> , and contrasted the regulatory approach in BC versus that in Washington State.
2009	Water Balance & Green Infrastructure Forum: Getting Green Infrastructure Built Right	Rémi Dubé developed the program and led the team that showcased how Surrey was moving beyond pilot projects to a watershed objectives approach. The forum posed the question: <i>HOW will a consistent regional approach to green infrastructure be achieved in Metro Vancouver?</i>
2010	Topsoil Primer Set / Bowker Creek Forum on Urban Watershed Restoration	Hosted by the Capital Regional District, the forum unveiled the <i>Bowker Creek Blueprint: A 100-Yr Action Plan to Restore the Watershed</i> . It was the venue where Rémi Dubé and Susan Rutherford announced release of the <i>Topsoil Primer Set</i> as a tool for use by local governments.



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## About the Partnership for Water Sustainability in British Columbia

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Incorporation of the Partnership for Water Sustainability in British Columbia as a not-for-profit society on November 19, 2010 was a milestone moment. Incorporation signified a bold leap forward.

Over two decades, the Partnership had evolved from a technical committee in the 1990s, to a “water roundtable” in the first decade of the 2000s, and then to a legal entity. The Partnership has its roots in government – local, provincial, federal.

The Partnership has a primary goal, to **build bridges of understanding** and pass the baton from the past to the present and future. To achieve the goal, the Partnership is growing a network in the local government setting. This network embraces collaborative leadership and **inter-generational collaboration**.

The Partnership believes that when each generation is receptive to accepting the inter-generational baton and embracing the wisdom that goes with it, the decisions of successive generations will benefit from and build upon the experience of those who went before them.

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