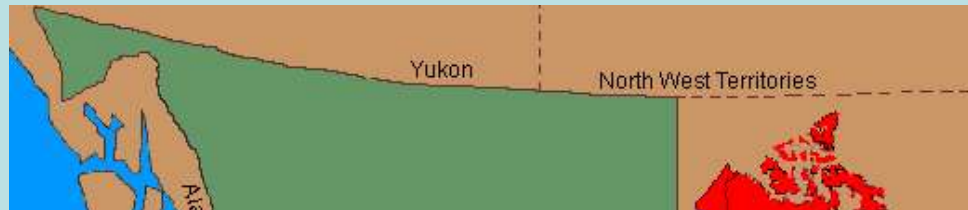


***Big Ideas* for Small Communities Sustainable Planning Workshop**



Design with Nature: Integration of Water Management with Landscape Development



**Quesnel, British Columbia
October 22, 2004**

Greater Vancouver Watersheds: Current Snowline at El 900m

- Capilano
- Seymour
- Coquitlam
- Municipal Boundaries
- Area above 900 m elev.
- Major Rivers & Streams
- Water

The Drought, Forest Fires and Floods
of 2003 Have Created a
Teachable Moment for Change

Warmer B.C. will get more rain

By Charlie Anderson
Staff Reporter

If warming trends continue, a report on B.C.'s climate shows, over the next 100 years we could get up to 20 per cent more rain, an 88-centimetre jump in sea levels, rivers drying up, a big dent in salmon

migration and a spreading of the mountain pine beetle.

B.C.'s average temperature could also increase by 4 C. Northern B.C.'s temperature has climbed 1.7 degrees over the past 100 years, three times the global average.

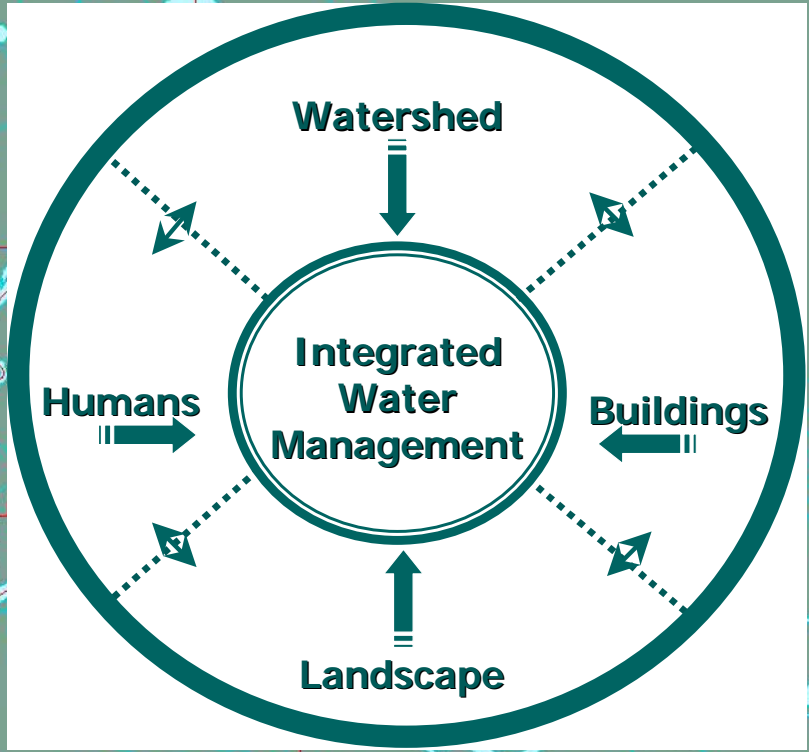
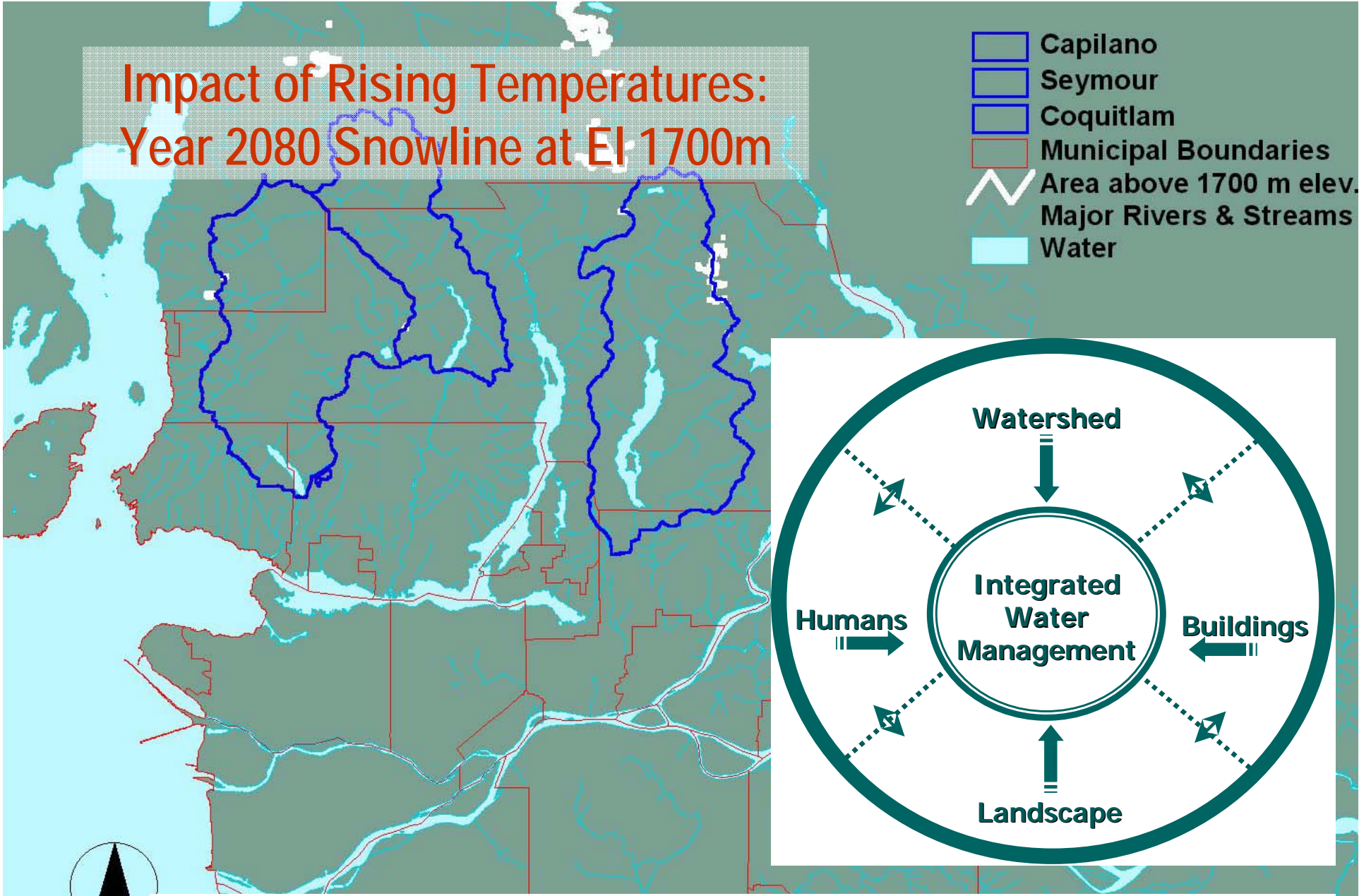
Joyce Murray, Minister of

Water, Land and Air Protection, yesterday released the report from the University of Victoria's Canadian Institute for Climate Studies. She said businesses and the public must be encouraged to use greener energy and reduce emission levels.

canderson@pacpress.southam.ca

Impact of Rising Temperatures: Year 2080 Snowline at El 1700m

- Capilano
- Seymour
- Coquitlam
- Municipal Boundaries
- Area above 1700 m elev.
- Major Rivers & Streams
- Water



Continuum of Water Use – Everything is Connected!



An aerial photograph of a river valley. In the center, a large dam with a prominent spillway is visible. To the left, a town with dense residential and commercial buildings is situated along the riverbank. To the right, a multi-lane highway bridge crosses the river. The surrounding landscape is a mix of green fields, forests, and some industrial or utility sites. The sky is clear and blue.

Presentation Road Map

- **Water Sustainability Action Plan**
- **Water Balance Model for BC**
- **Walking the Talk - Chilliwack**

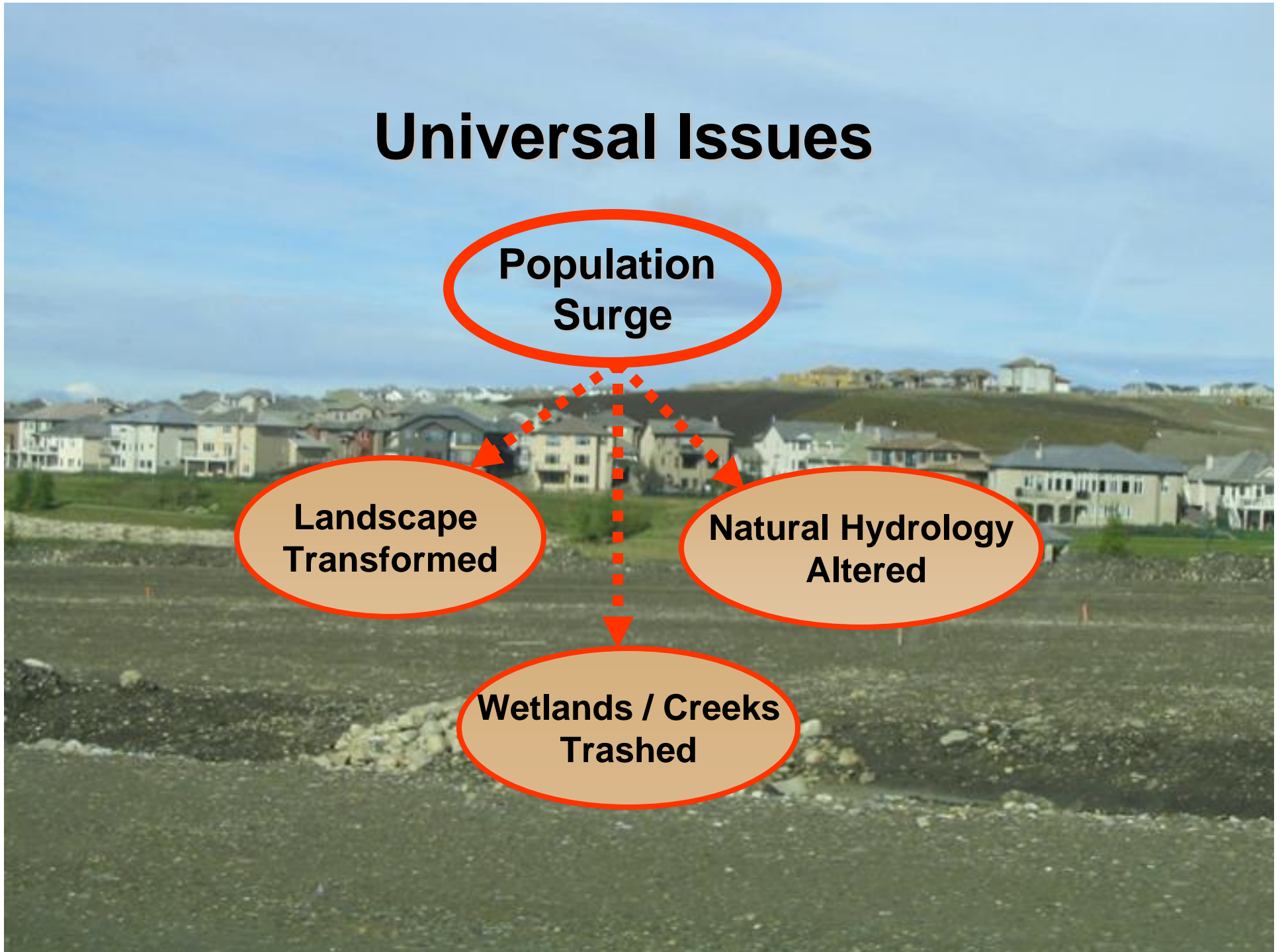
Universal Issues

Population Surge

Landscape Transformed

Natural Hydrology Altered

Wetlands / Creeks Trashed



Building a Vision & Creating a Legacy

Issue: How We Manage Population Growth

Impact: Growth Resulting in Densification
(Land Constraints; Smaller Lots)

Sustainability: Means Design with Nature

Built Environment: We Can Improve It

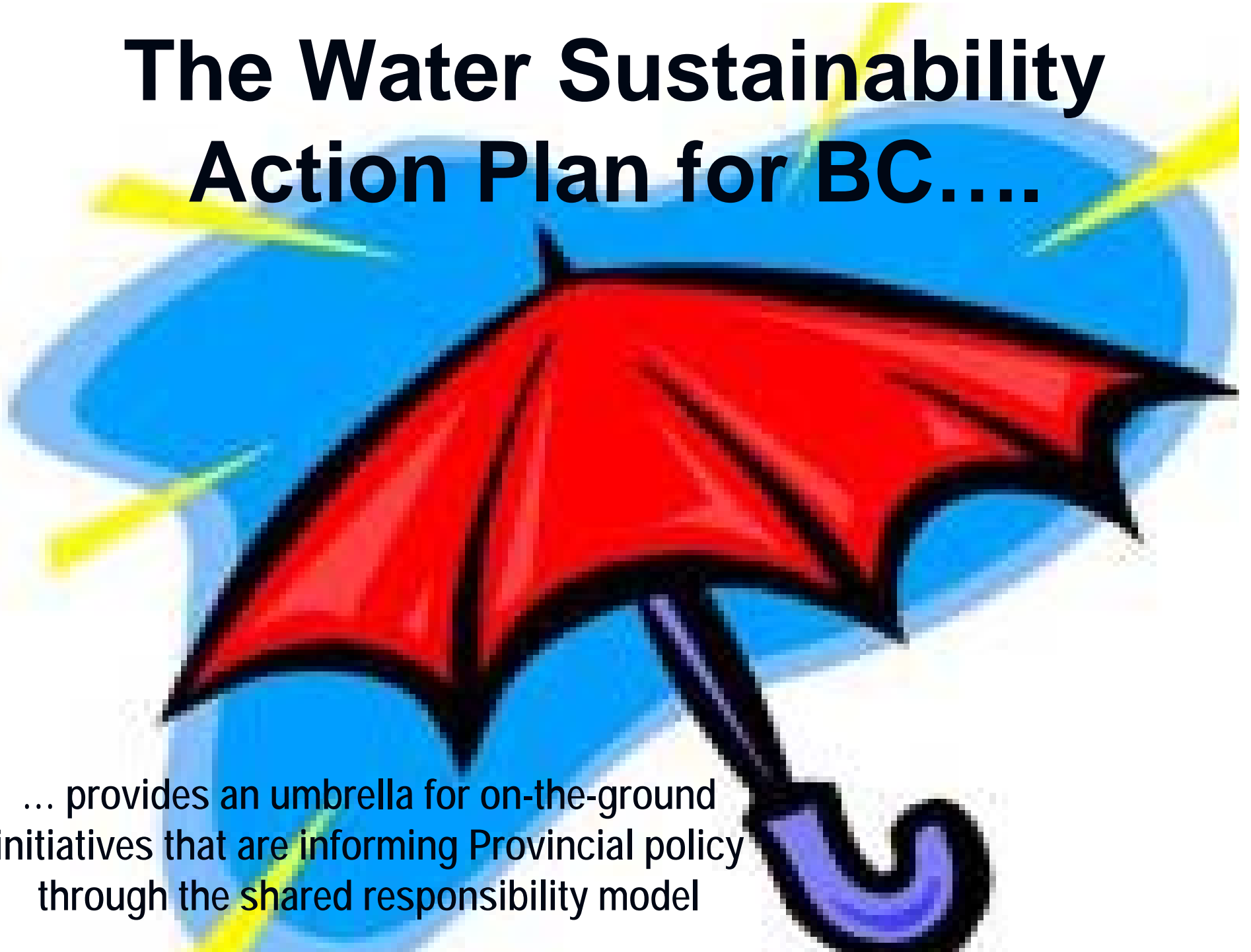
Natural Environment: We Can Protect It

Cumulative Benefits: Accrue Over Time

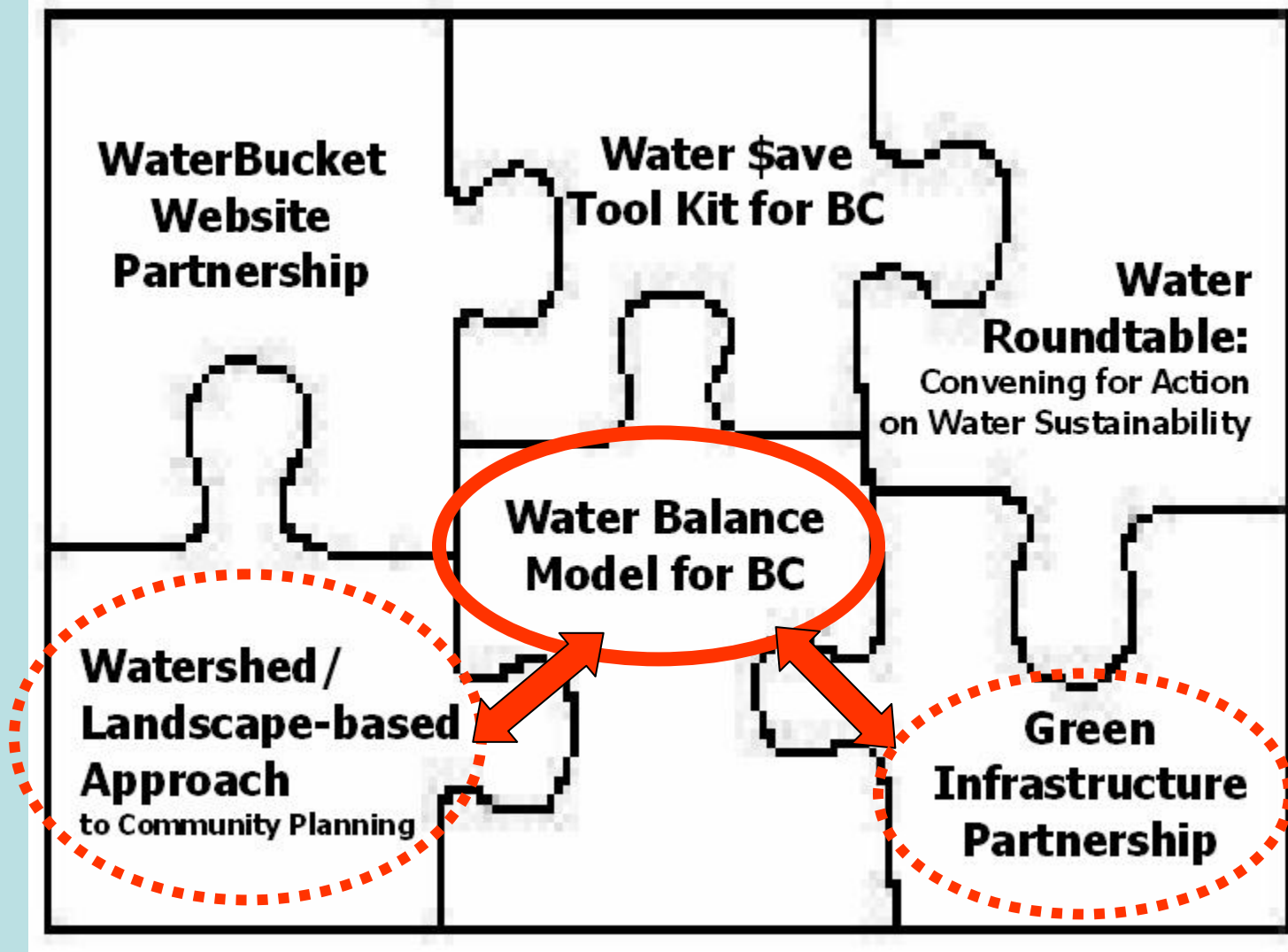
Outcome: Sustain Community Livability

The Water Sustainability Action Plan for BC....

... provides an umbrella for on-the-ground initiatives that are informing Provincial policy through the shared responsibility model



Action Plan Elements



An aerial photograph of a campus or park area. In the foreground, a wide river flows from the bottom left towards the center. To the right of the river, there are several large, light-colored buildings, likely school buildings, with parking lots. In the middle ground, there are green fields, some of which appear to be sports fields. The background is dominated by a dense forest of tall, dark green trees. The overall scene is a mix of natural and built environments.

Points of Reference

1. Focus efforts on influencing choices by individuals and organizations
2. Use the term "sustainability" as a lens for considering approaches that influence choices

waterbucket

facilitating more sustainable approaches to water resources

enter

Who We Are

The Water Sustainability Committee (WSC) of the BC Water and Waste Association (BCWWA) is a broad-based, informal coalition of people who have diverse backgrounds and experience in water resource management and related disciplines.

Our Vision

The vision of WaterBucket.ca is to provide a resource rich, highly interactive "destination location" website for information and communication related to water sustainability in the Province of B.C.

water use & conservation

waterbucket

facilitating more sustainable approaches to integrated water management

Water Save Tool Kit | Legislation & Programs | Resources | Networking

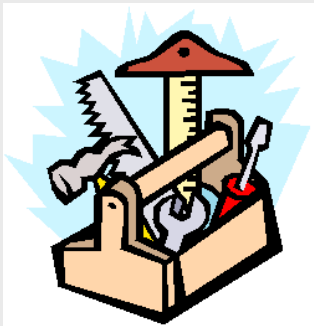
Success Stories

Web Resources

When the topic is water, the goal is that the phrase "just go to waterbucket.ca" will over time become part of everyday language.

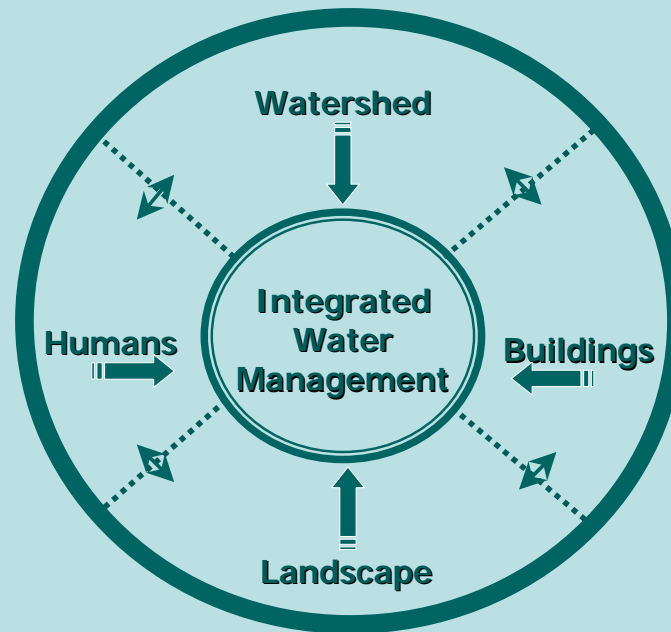
Water \$ave Tool Kit

**WATER
\$AVE
TOOL
KIT**



- ***What is it?***
 - ~ A collaborative effort between MWLAP and BCWWA Water Sustainability Committee
 - ~ ***Initially:***
On-the-ground practices that will enable individuals and communities to achieve water conservation objectives.
 - ~ ***Eventually:***
A “living document” that tracks progress and trends throughout BC, shares lessons learned and highlights successes.

BC Water Roundtable – Convening for Action on Water Sustainability



The goal is to make *Integrated Water Management* mainstream through development, endorsement and implementation of integrated policies, programs and standards of practice



Drainage Planning in BC Has Been Evolving Over the Decades

- 1960s: Pipe and Remove
- 1970s: Detain Peak Flows
- 1980s: Reactive Mitigation
- 1990s: Stream Stewardship*
- 2000s: Sharing a Vision**

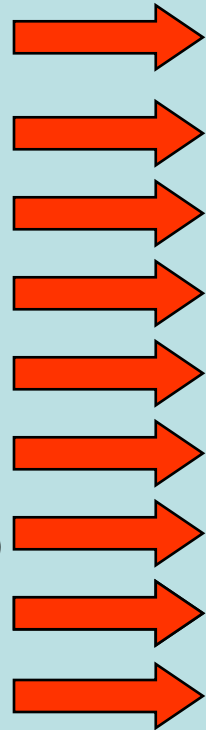
* Proactive Management

** Watershed-Based Rainwater Management

Integrated Rainwater Management Planning

From TRADITIONAL to

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



INTEGRATED:

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

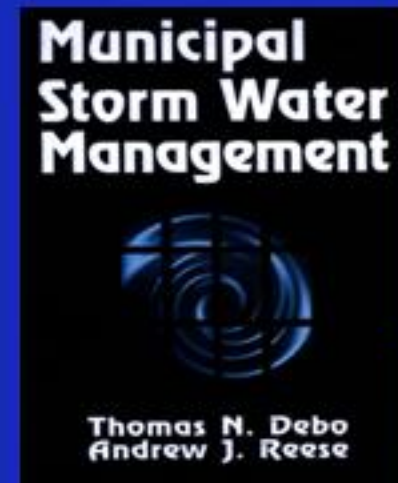


Andy Reese

“Do you know where you really are in the shifting paradigms of stormwater management?”

1. Run it in Ditches
2. Run it in Pipes
3. Run it in Stormwater Pipes
4. Keep it from Stormwater Pipes
5. Well, Just Don't Cause Flooding
6. Oh, and Don't Pollute Either
7. It's the Ecology, Stupid
8. Water is Water is Watershed
9. Green and Bear It

10. Build the Vision, Create the Legacy





WATER
Balance
MODEL
FOR BRITISH COLUMBIA

Inter-Governmental Partnership: Vision

To promote changes in land development practices so that:

- The built environment will preserve and/or restore the natural water balance over time
- Performance targets will be achieved for runoff volume and flow rate reduction at the source, *where rain falls*



Presentation Road Map

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The Missing Link in Watershed Planning has been...

**A tool that quantifies the benefits –
in terms of reducing rainwater runoff volume -
of installing source controls under different
land use, soil and climate conditions**



WATER Balance MODEL FOR BRITISH COLUMBIA

The Water Balance Model promotes a watershed-based approach that manages the natural environment and the built environment as integrated components of the same watershed.

Learn why the Water Balance Model is an important resource

See how the Water Balance Model can be applied.

View recent presentations

To
M

Cr
Develop Scenarios
Describe Native Soils
Add Land Use Information
Describe Surface Types



WATER Balance MODEL FOR BRITISH COLUMBIA

Partners • About • Home

Access Model • Resources • Background



The Water Balance Model promotes a watershed-based approach that manages the natural environment and the built environment as integrated components of the same watershed.

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To
M

Cr
Develop Scenarios
Describe Native Soils
Add Land Use Information
Describe Surface Types

IGP Proceeding with Training Workshops

The mission is landowners to rainwater volu conditions.

The goal is th development

To accomplish based support Outreach and and training s

OCEP was lau event provide with the Urban development

- Public Domain
- Web-based
- Interactive
- Decision Support

verments and ance targets for soil and climate

i for land

build broad- : via an resentations lore

alities. This collaborating he land



www.waterbalance.ca



Richard Boase, **Environmental Planner** for the District of North Vancouver, demonstrates the positive impacts that 300mm of absorbant soil can have for **infiltration** at a Water Balance Model Training seminar sponsored by the Urban Development Institute.



A GUIDEBOOK FOR BRITISH COLUMBIA

Stormwater Planning

The Water Balance Model has been developed as an extension of the Guidebook methodology



Guidebook Premise: Land Development and Watershed Protection can be Compatible

Policy Level Development Objectives

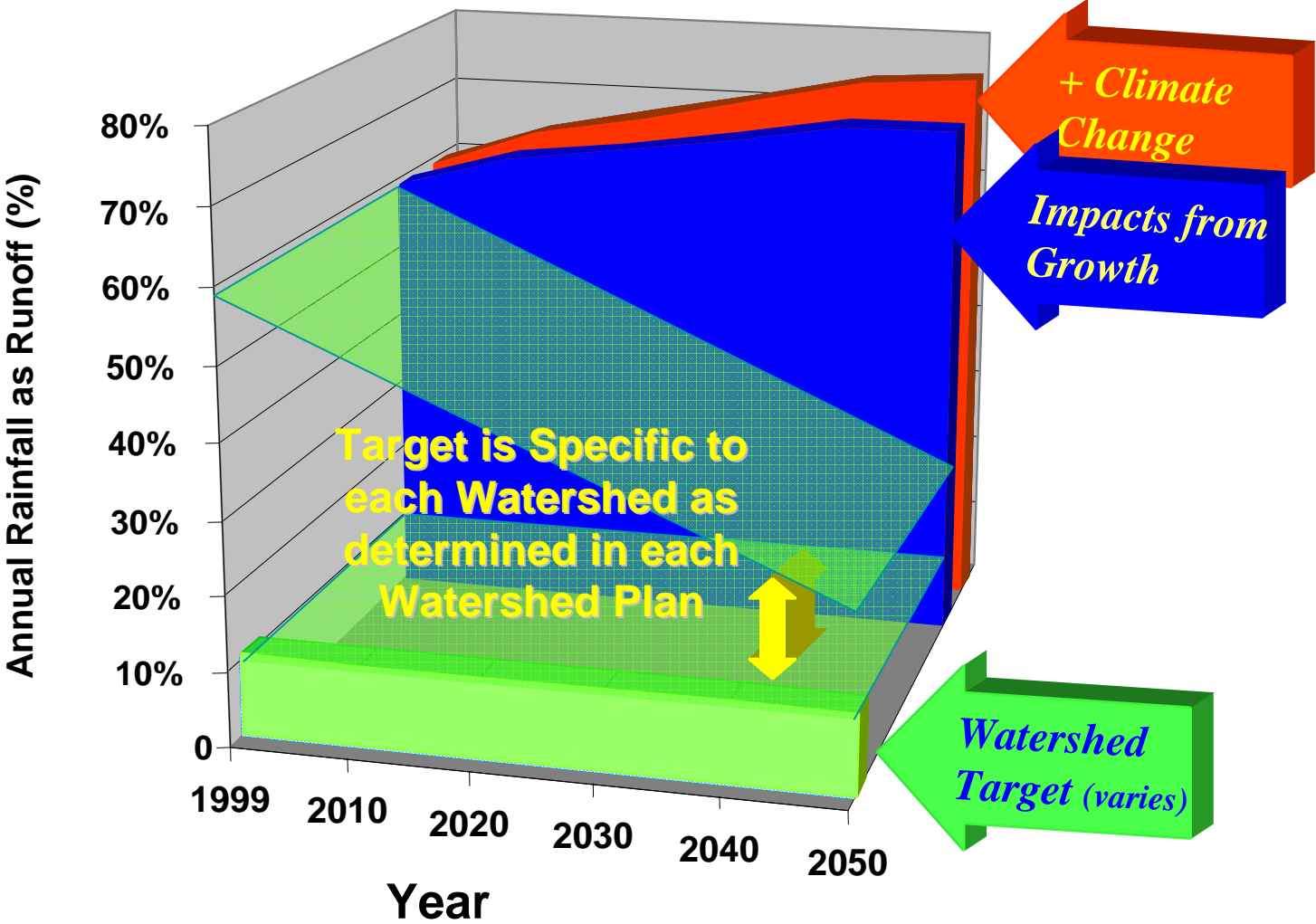
Science-Based Understanding
of Development Impacts

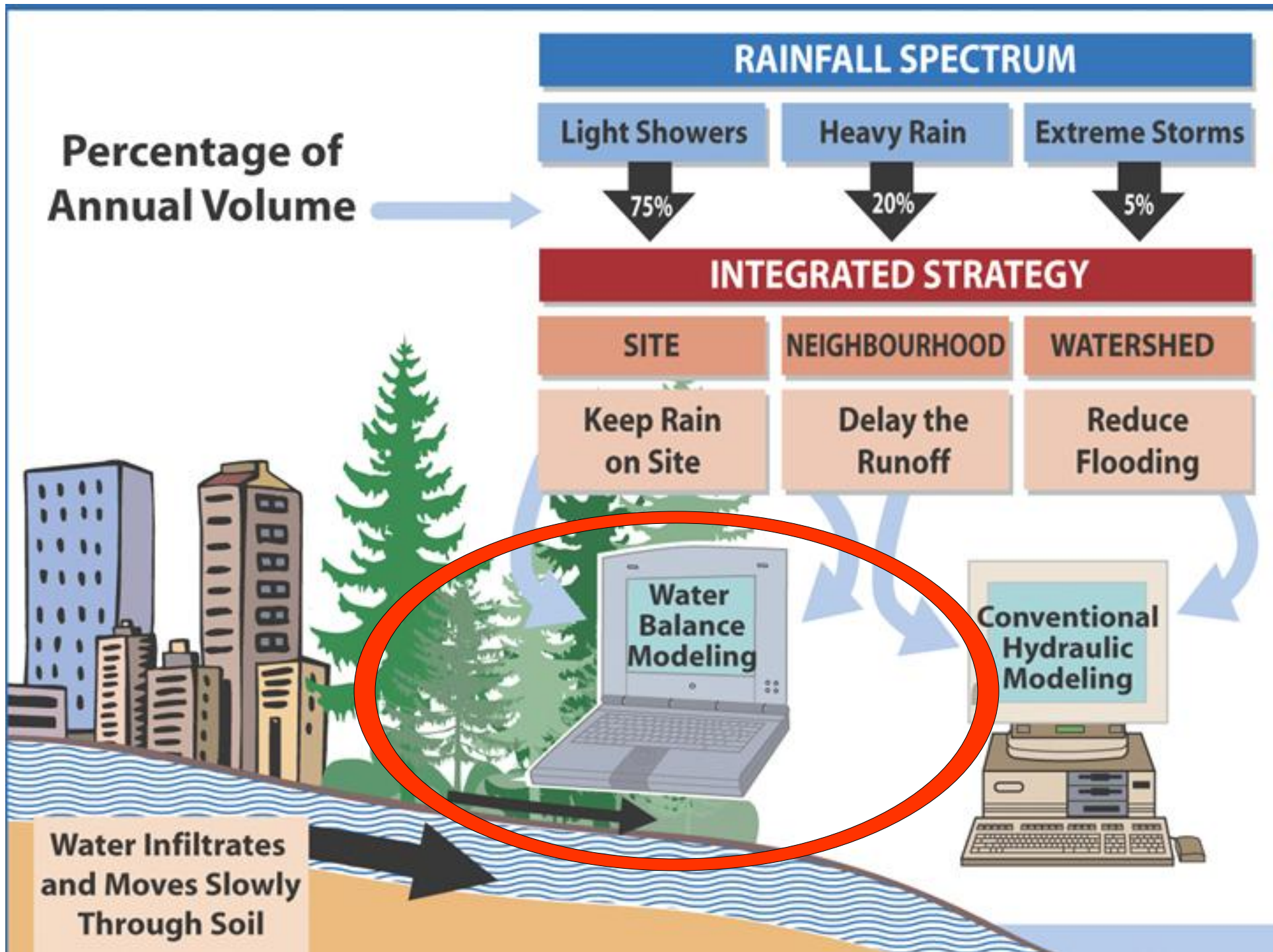
Site Design Practices that achieve Objectives



WATER Balance MODEL FOR BRITISH COLUMBIA

The Big Picture: Watershed Targets





Water Balance Model promotes Integration of Perspectives

- **Planners:** Tool for Better Use of Space
- **Engineers:** Tool for Infiltration Pre-Design
- **Landscape Architects:** Tool for Green Solutions
- **Educators:** Tool for Social Marketing

How the Water Balance Model is being used to make better decisions:

- **Local Governments** -
when communicating with the public
- **Planners and Engineers** –
when setting performance targets
- **Developers and their Consultants** -
when testing scenarios
- **Environmental Agencies** -
when monitoring watershed health

Long-Term Vision

Use of the model will become standard practice in British Columbia for land development decisions

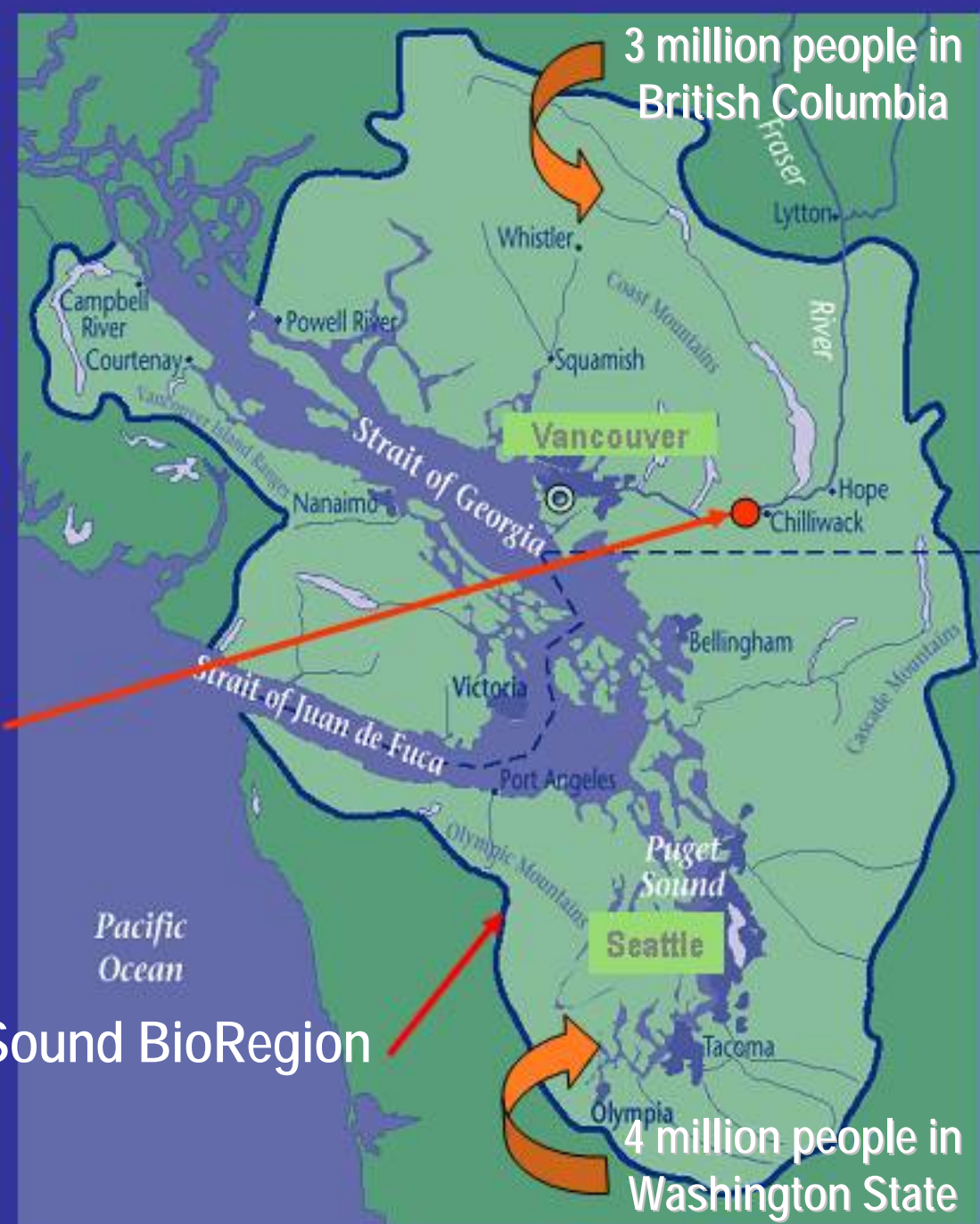




Presentation Road Map

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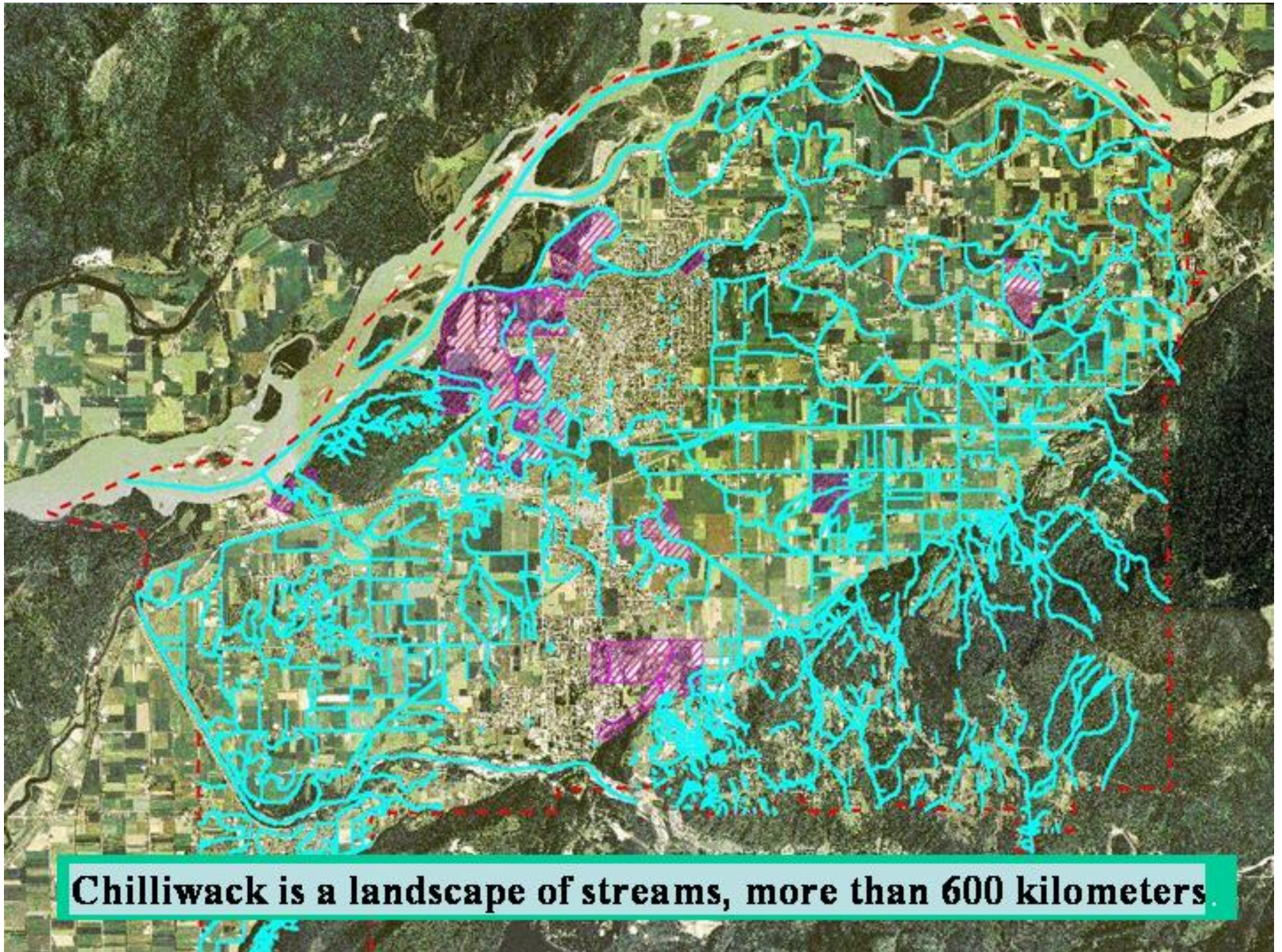
3 million people in British Columbia



Chilliwack is a community of 70,000 in the Fraser Valley

Georgia Basin / Puget Sound BioRegion

4 million people in Washington State



Chilliwack is a landscape of streams, more than 600 kilometers.

Flood Overflows in Some Areas are Chronic Because

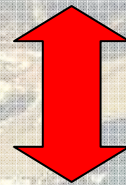
An aerial photograph showing a large area of flooding. The water is a murky, brownish-grey color, covering a significant portion of the landscape. In the foreground and middle ground, there are several buildings, some with grey roofs, and green fields. The background shows rolling hills and more distant buildings under a hazy sky. The overall scene depicts a rural area affected by a major flood event.

- Too Much Runoff Volume
- Culvert Constrictions Cause Backwatering
- Pump Station at Fraser River a Bottleneck

21. 10. 2003

Providing Developers with Guidance

***Stormwater Planning:
A Guidebook for BC***

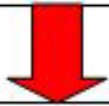


***Chilliwack Manual for
Surface Water Management***



Design Guidelines for Developers

#1 – Strategic
Data Collection



#2 – Policy & Design Criteria
Manual



#3 – Sustainable Subdivision
Design



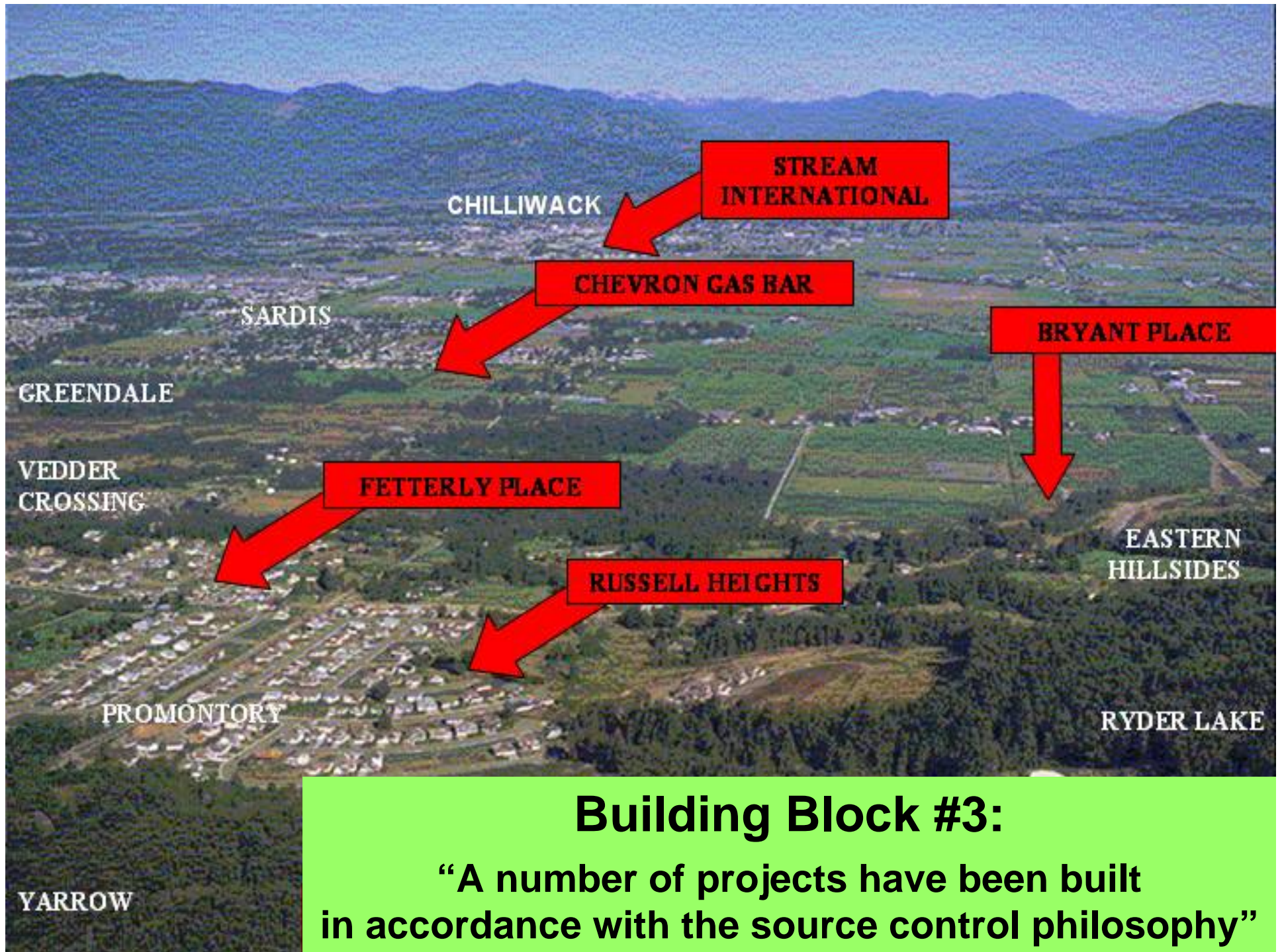
#4 – Integrated Master
Drainage Plans



#5 – Performance Monitoring
Program

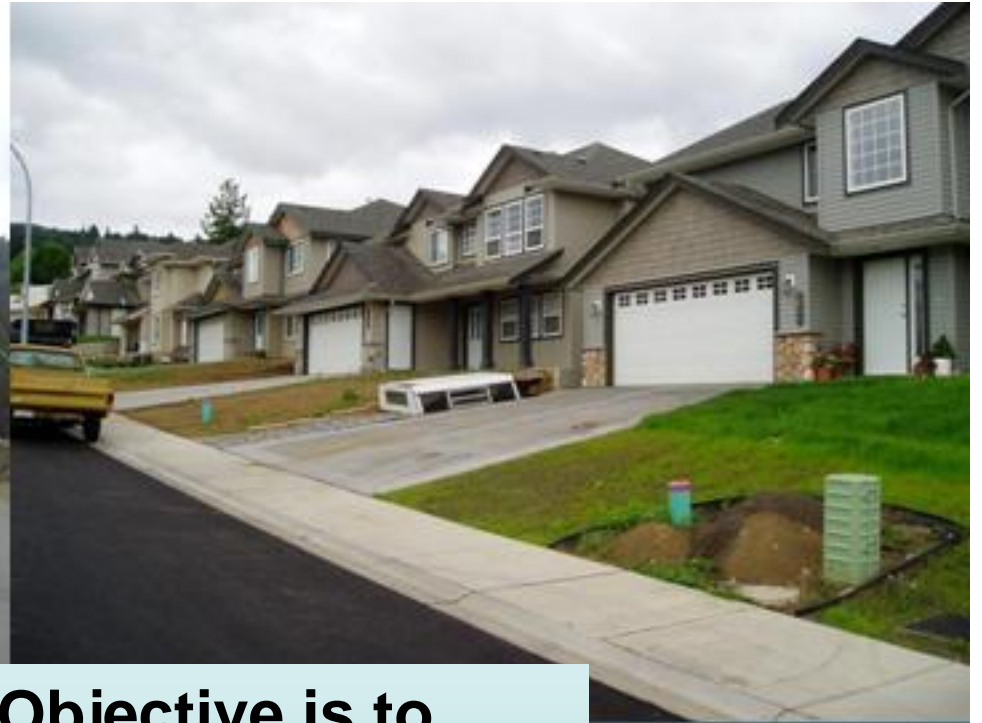
The Goal - Solutions that:

- Are Integrated
- Solve Problems
- Achieve Multiple Objectives
- Promote Liveability
- Are Affordable



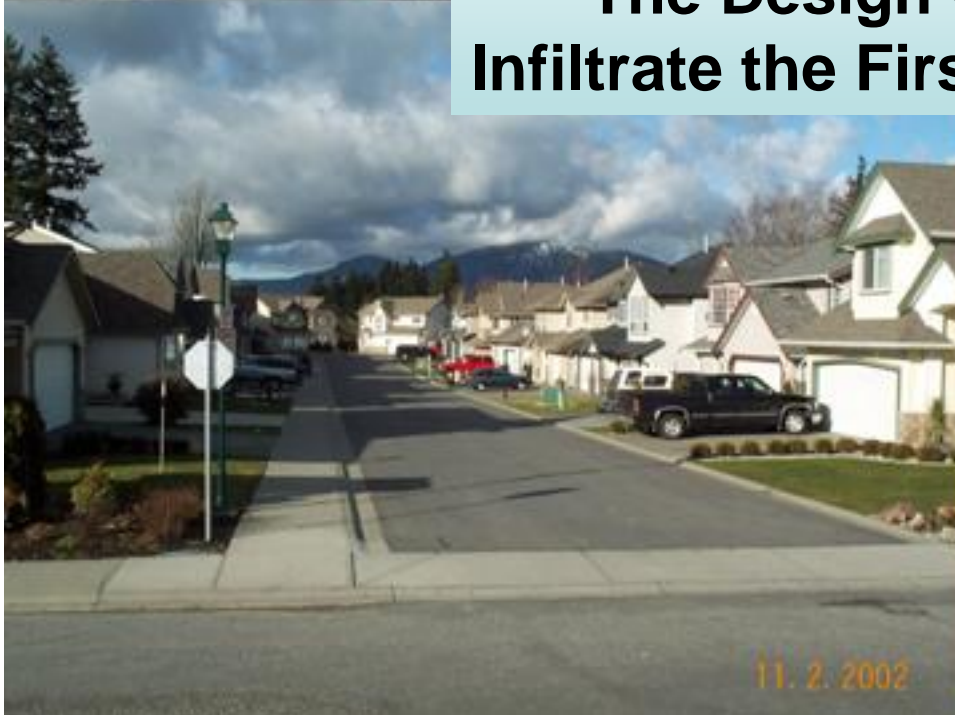
Building Block #3:

“A number of projects have been built in accordance with the source control philosophy”



The Design Objective is to Infiltrate the First 30mm of Rainfall

age at Sardis Park





“Sustainable Subdivision Design is Part of the Flooding Solution”

City's Current Landscaping Requirements Can Also Accommodate Infiltration

Land Use Little area is needed for source control infiltration. The galleries can be installed under landscape or asphalt parking.	Percentage of Land Needed for Infiltration	
	Deep Infiltration Systems	Shallow Infiltration Systems
Commercial / Industrial	2.5%	6.7%
Institutional	2.2%	5.3%
Residential – Low Density	1.4%	3.1%
Residential – Medium/High Density	2.3%	6.3%

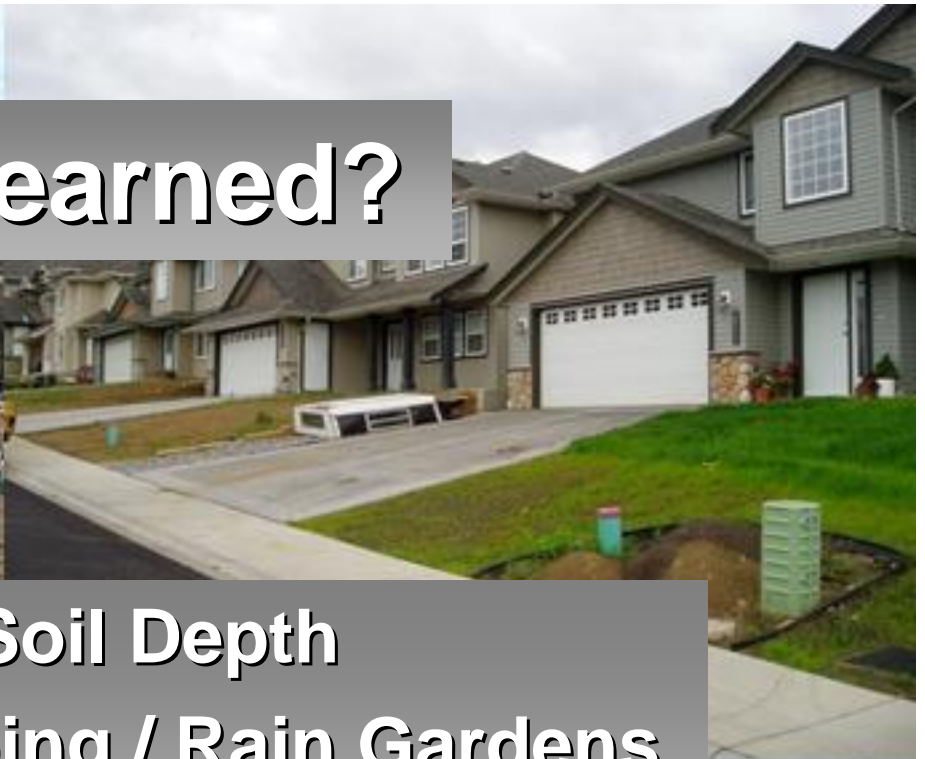


Building Block #5:

“Rainfall and Flow Monitoring for the First Two Demonstration Projects Has Confirmed That Infiltration Systems Do Work”

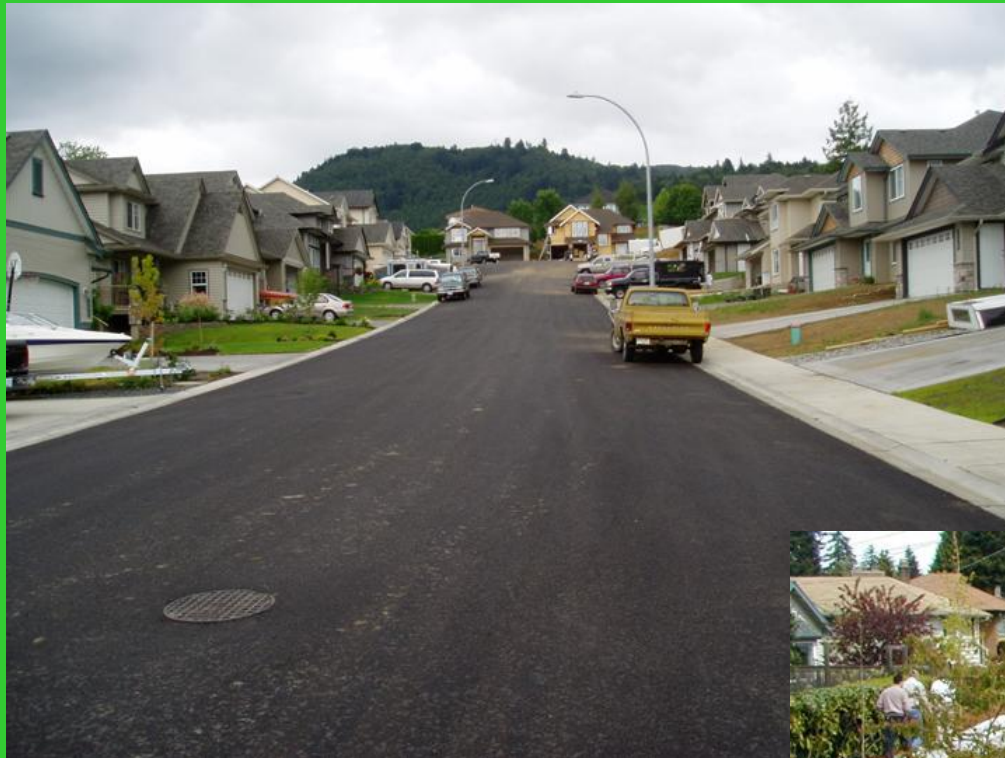
Lessons Learned?

- Provide Minimum Soil Depth
- Promote Landscaping / Rain Gardens
- Control Driveway Drainage



“Sea of Roofs”





Livability and Streetscape Design: We Have Choices

**Will Streets Be
Sterile and Uninviting,
Or Green and Inviting?**



**City of Seattle
Street Edge Alternatives Program**



Key Messages

- 'Break the connection'
- Encourage 'rain gardens'



Over time, we can...

**move from cumulative impacts
to cumulative benefits**