The Future Oaklands Green Space

Climate Change and The Value of Urban Green Space

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The Future of Oaklands Green Space:

Climate Change and
The Value of Urban Green Space

1. Historical and Current Landscape Condition and Landscape Systems

2. Climate Change Impacts
   Wetter Winters, Drier Summers

3. Climate Change Adaptation using Landscape
   Soil, Roots + Trees

4. Integrating Functional Landscape
   Past/Current/Future Design Strategies

5. What does 'functional landscape' look like?

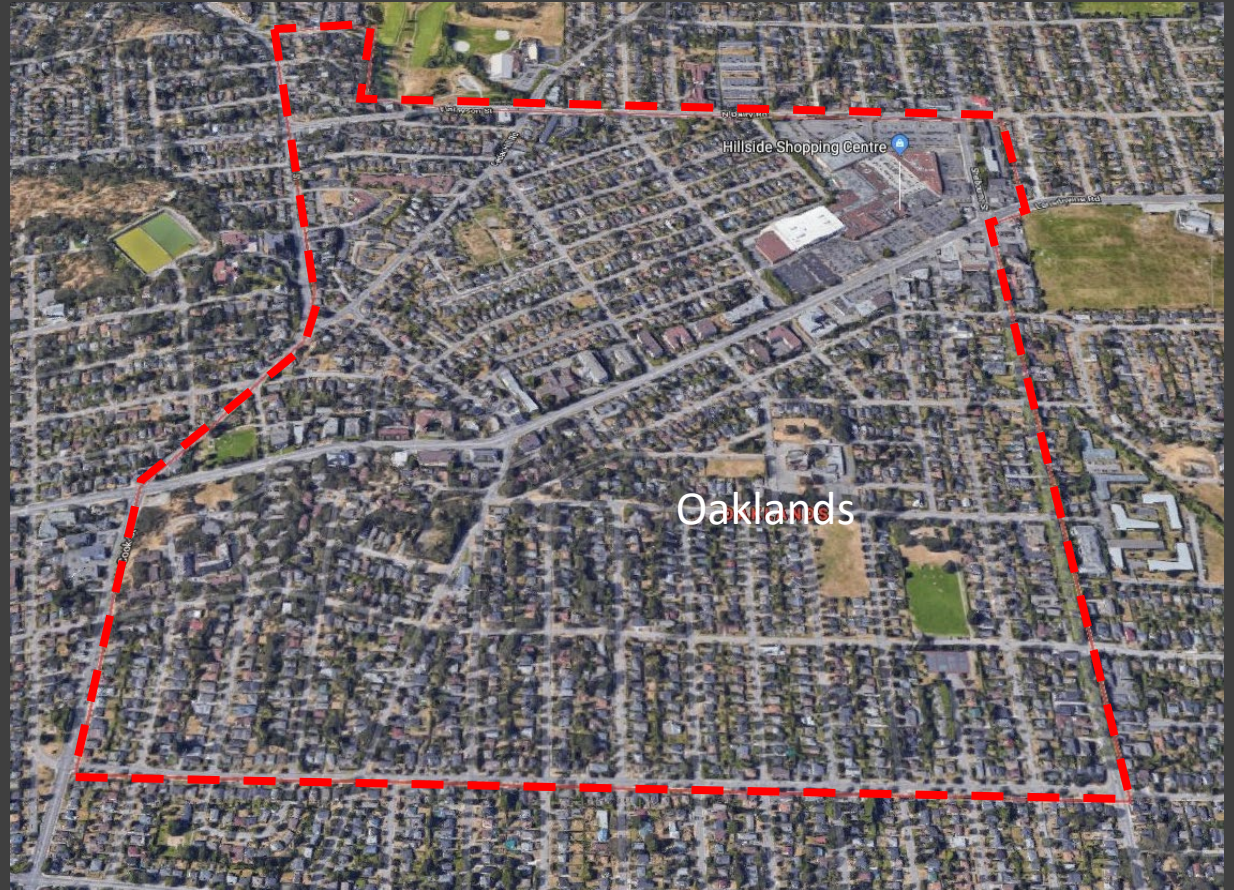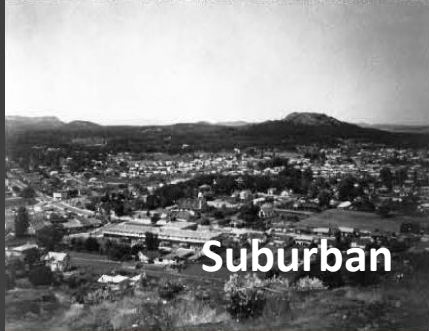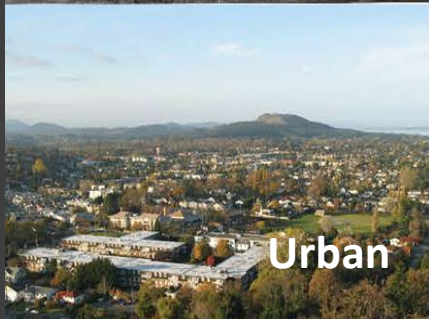6. Forward 50 Years – Incremental Change

Lost & Non-functional Streams

CRAIGFLOWER CREEK

COLQUITZ RIVER WATERSHED

HOSPITAL CREEK

DOUGLAS CREEK

HOBBS CREEK

CECELIA

GORGE CREEK

BOWKER

ROCK BAY

Oaklands

FISHERMANS

EMPRESS CREEK

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Historical Land Cover Change

1800

1880

Agriculture

1970

Suburban

2003

Urban

Oaklands

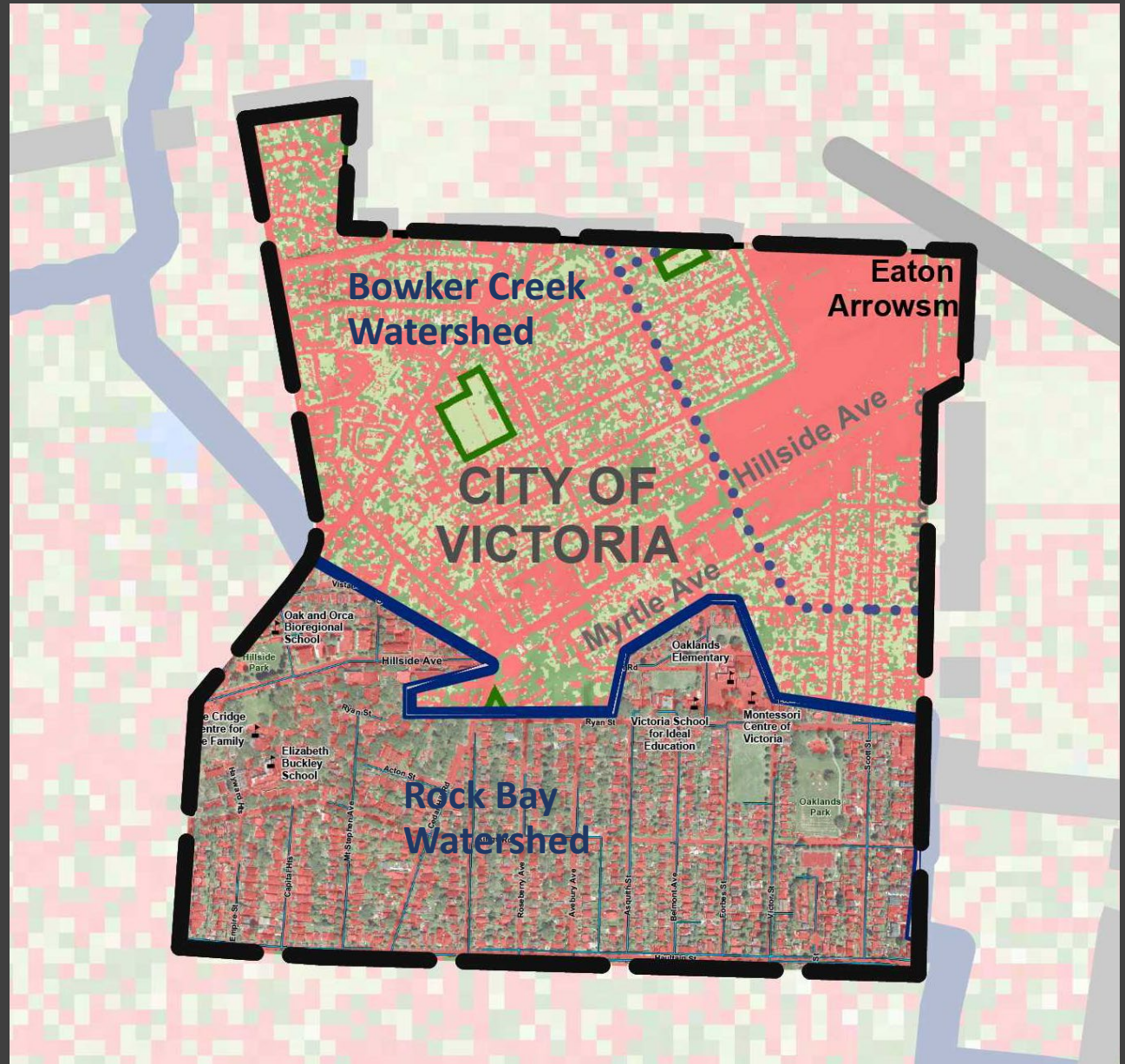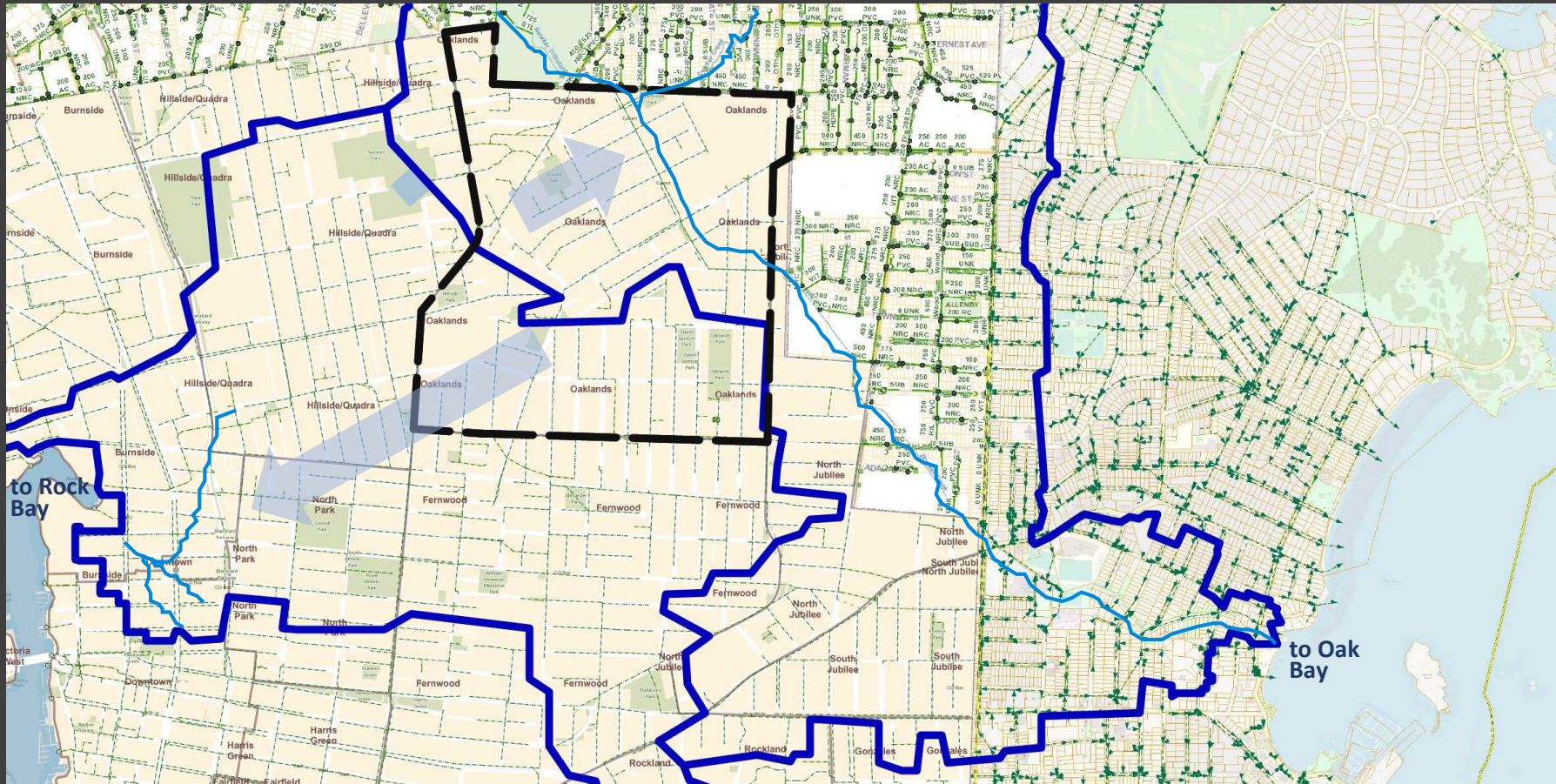Hillside Shopping Centre

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Land Cover (2011)

Legend:
- Unclassified
- Lake, Pond
- Riparian Area, Seasonal Wetland
- Grass, Shrub, Bare Ground, Exposed Rock
- Tree Cover
- Building, Road, Parking Lot (Impervious Surface)
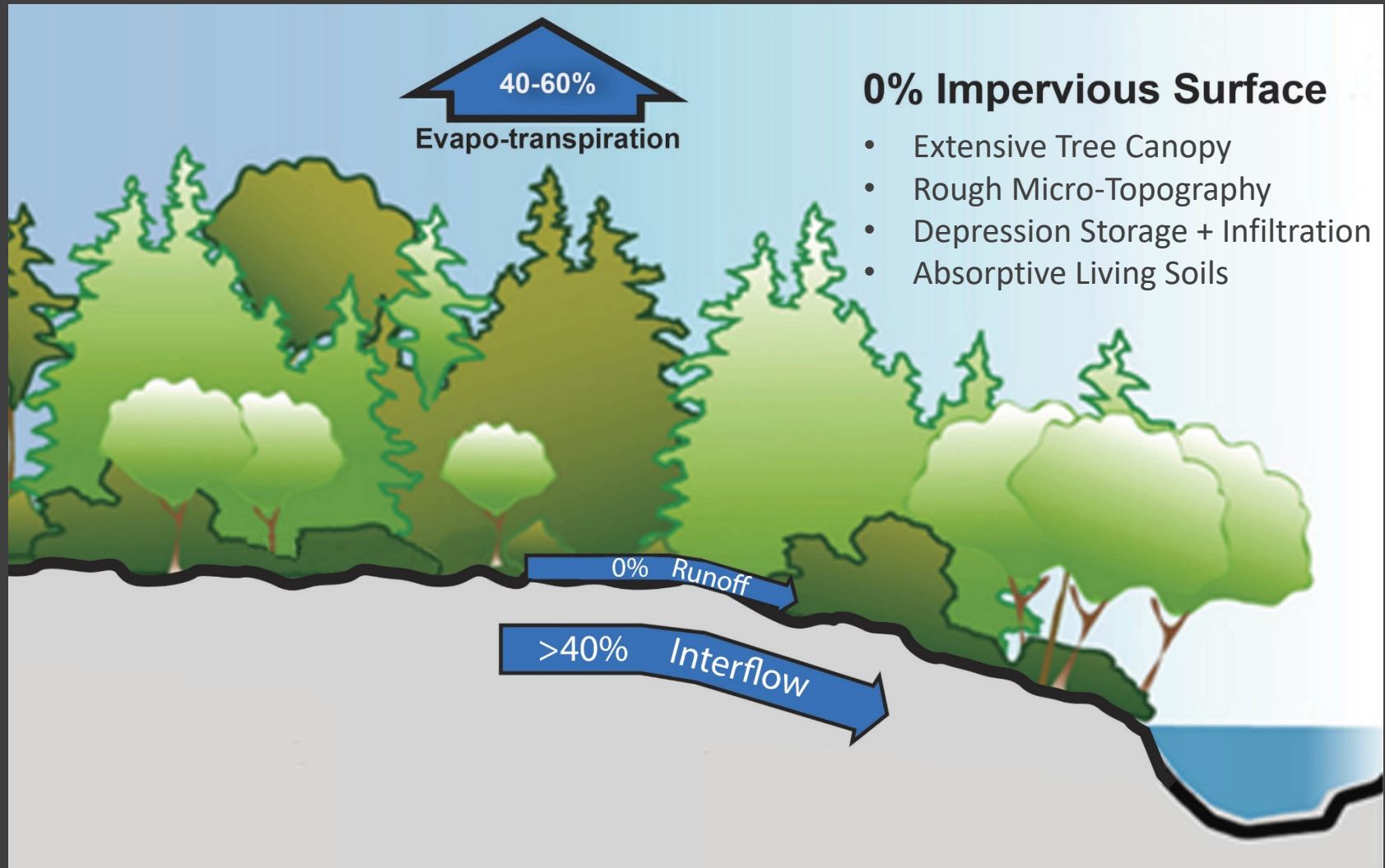- Agricultural Field
- Watershed Boundary

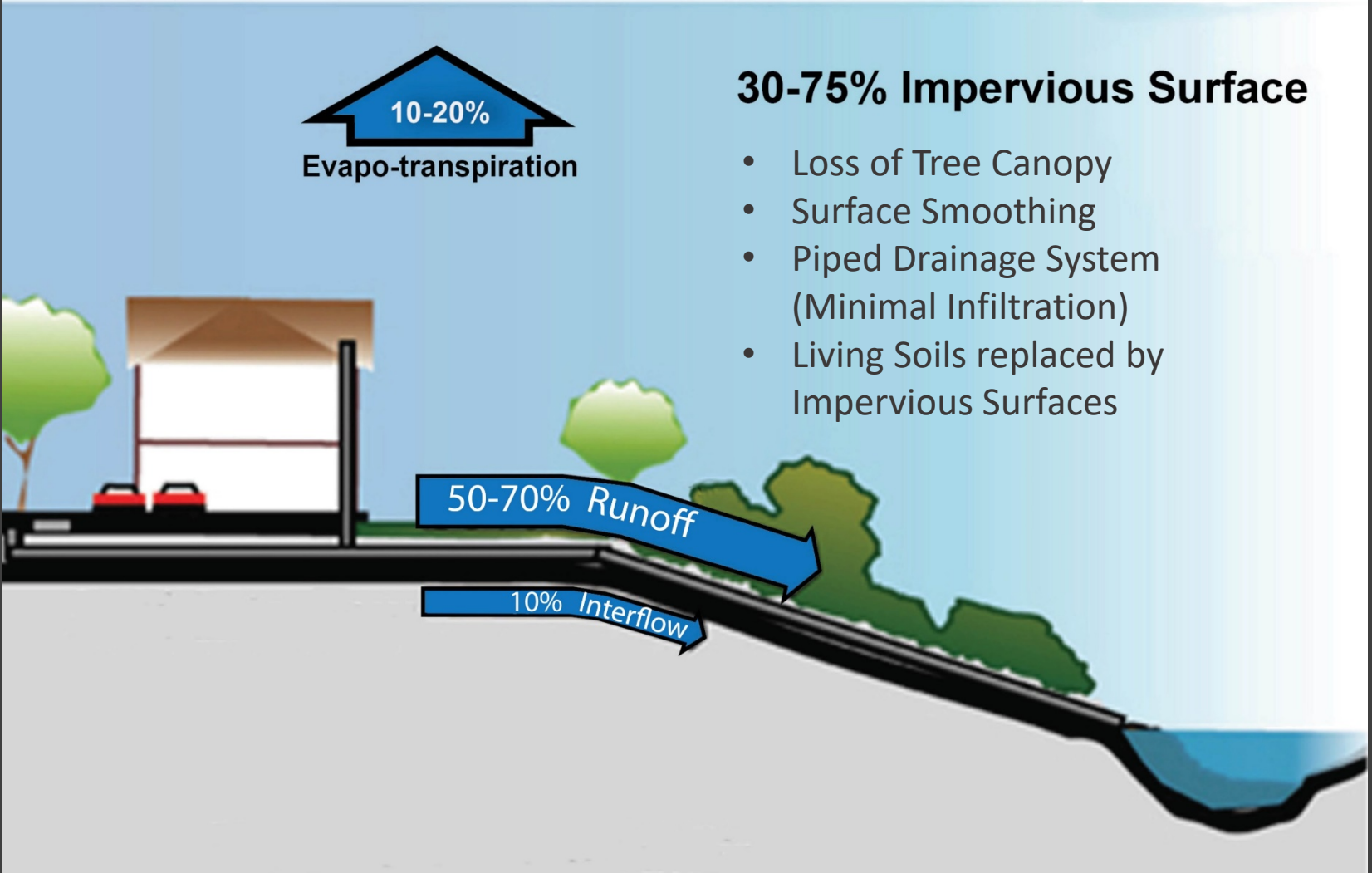Bowker Creek Watershed

Eaton Arrowsm

Hillside Ave

CITY OF VICTORIA

Myrtle Ave

Rock Bay Watershed

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Drainage

Post-development : pipes　　　　　Pre-development: streams

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Pre-Development Landscape System

40-60%
Evapo-transpiration

0% Impervious Surface
- Extensive Tree Canopy
- Rough Micro-Topography
- Depression Storage + Infiltration
- Absorptive Living Soils

0%   Runoff

>40%   Interflow

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Current Landscape Function


10-20%
Evapo-transpiration

30-75% Impervious Surface

- Loss of Tree Canopy
- Surface Smoothing
- Piped Drainage System (Minimal Infiltration)
- Living Soils replaced by Impervious Surfaces

50-70% Runoff

10% Interflow

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Climate Change in BC: Winter Precipitation

- Increase storm intensity

- Increased frequency of events

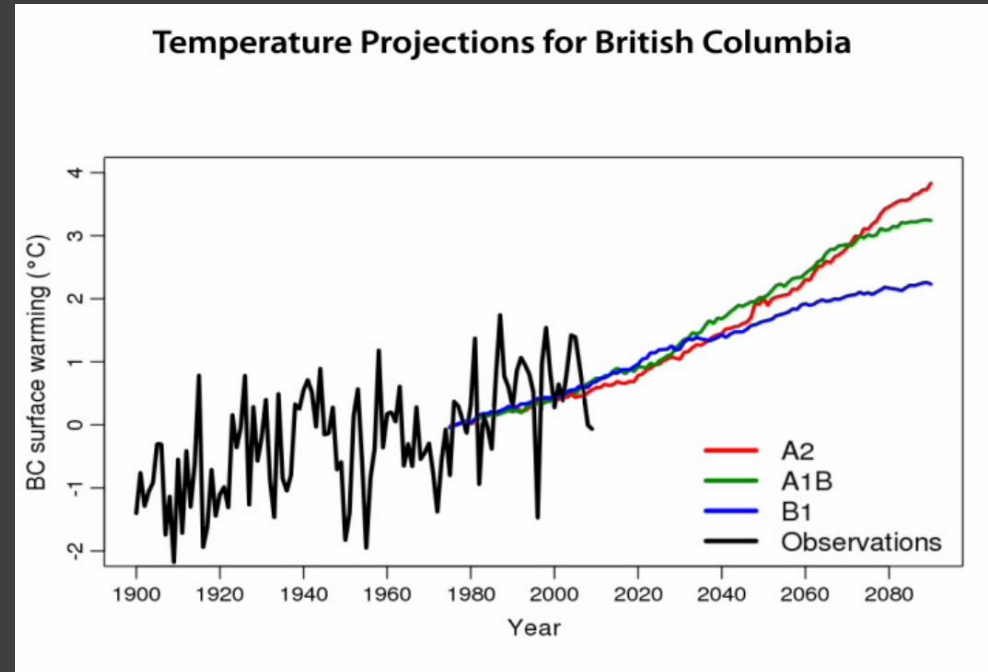- More precipitation in the fall and early winter

A1B Precipitation (% change)

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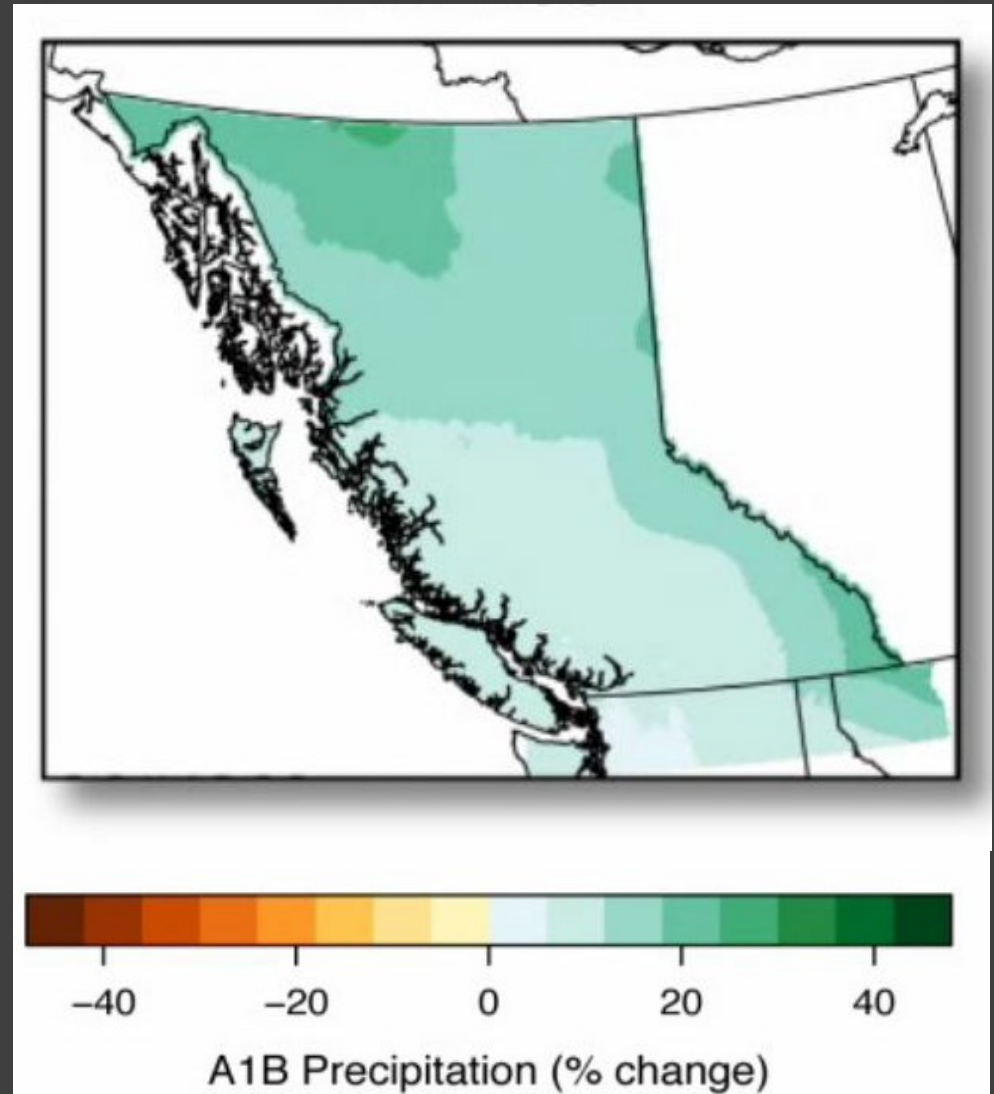
Climate Change in BC:
Summer Precipitation

- Reduced summer rainfall

- Increased drought duration

A1B Precipitation (% change)

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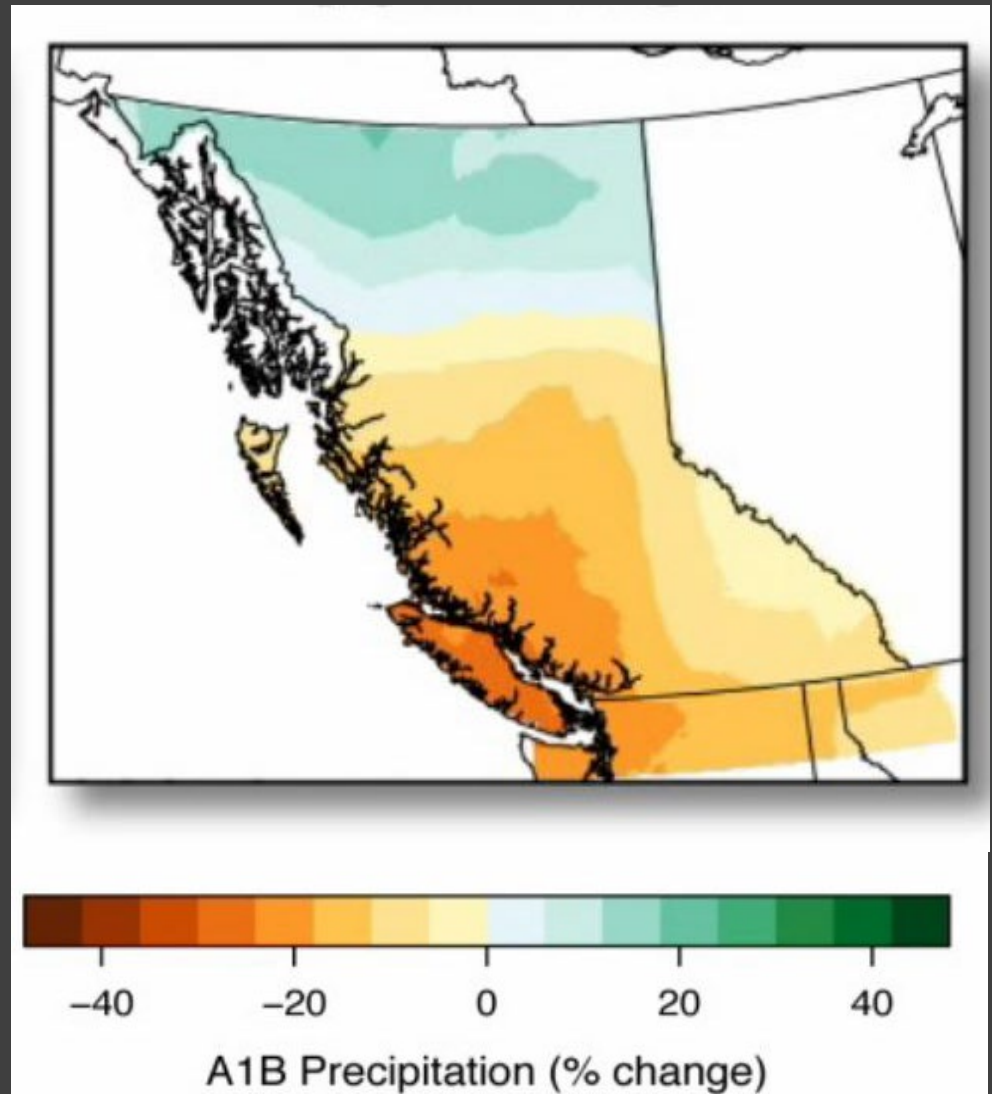
Climate Change in BC:
Temperature Change

- Warmer average temperature

- Increased frequency of summer hot weather days

- Urban heat island affect increase

Temperature Projections for British Columbia

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Which is more adaptable to climate change impacts?

Urban Green Space Building Block:

Living Soils

- "A square metre of grassland or temperate woodland will have from 100-500 earthworms"
  - Clive A. Edwards, Ohio State University

- One tablespoon of soil contains 50 billion microbes... conditions that favor soil life also promote plant growth and help breakdown and/or capture pollutants.

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Urban Green Space Building Block:

Roots and Infiltration

"Black Oak and Red Maple Trees... penetrated compacted soil, increasing infiltration rates by an average of 153% compared to an unplanted control."
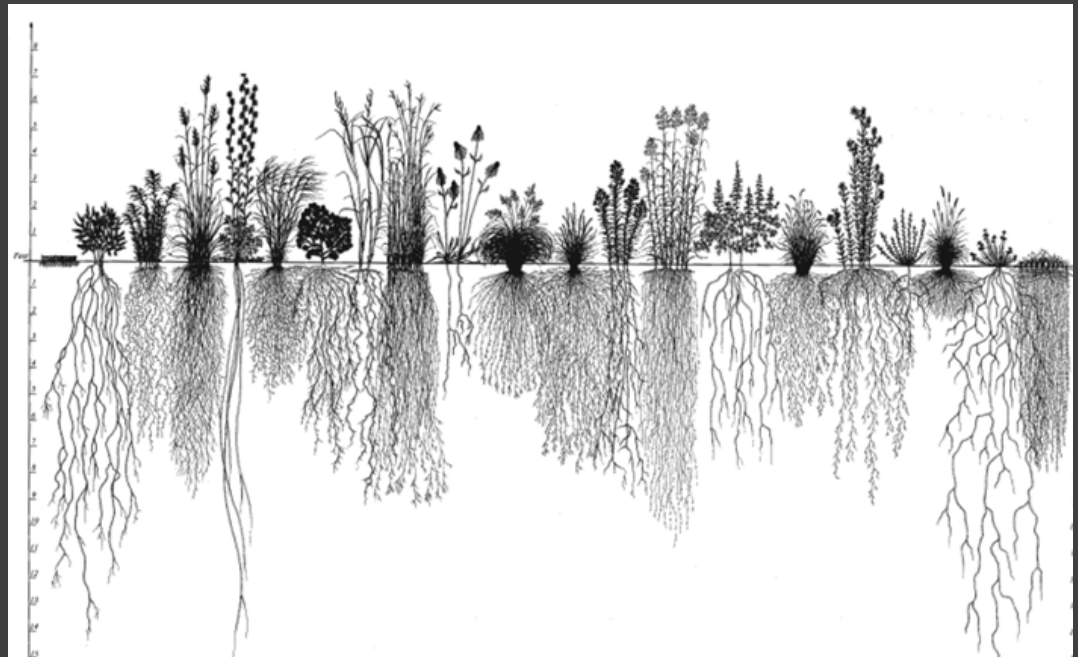
Bartens et. Al. 2008

Deep Roots

 Enhance Infiltration

Dense Roots

Create Soil Stability and Resistance

Dead Roots

Contribute to Soil Organic Matter, Carbon Fixation in the Soil, and Macropore Development

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Urban Green Space Building Block:

Trees

Interception

10-45% of Annual Rainfall
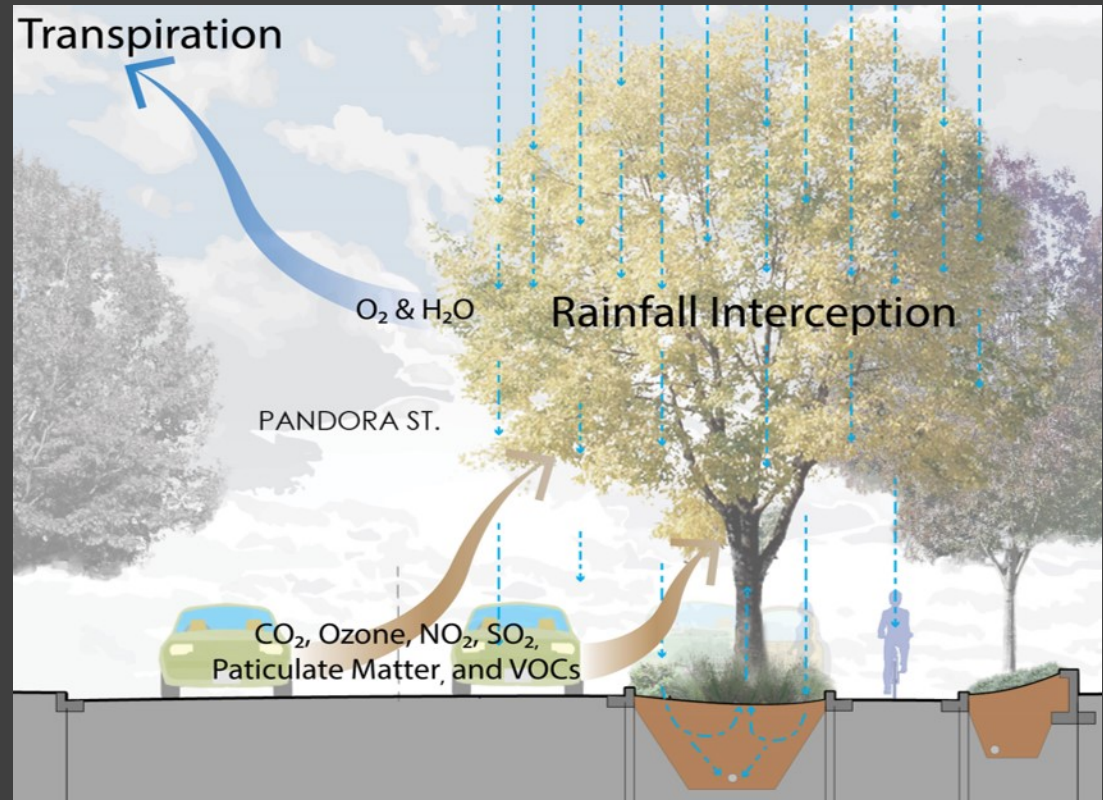(Water use by trees, 2005)

Transpiration

30-39% of Annual Rainfall
(Water use by trees, 2005)

Pollutants and CO2

A large tree averages up to
263 lb of CO2 savings
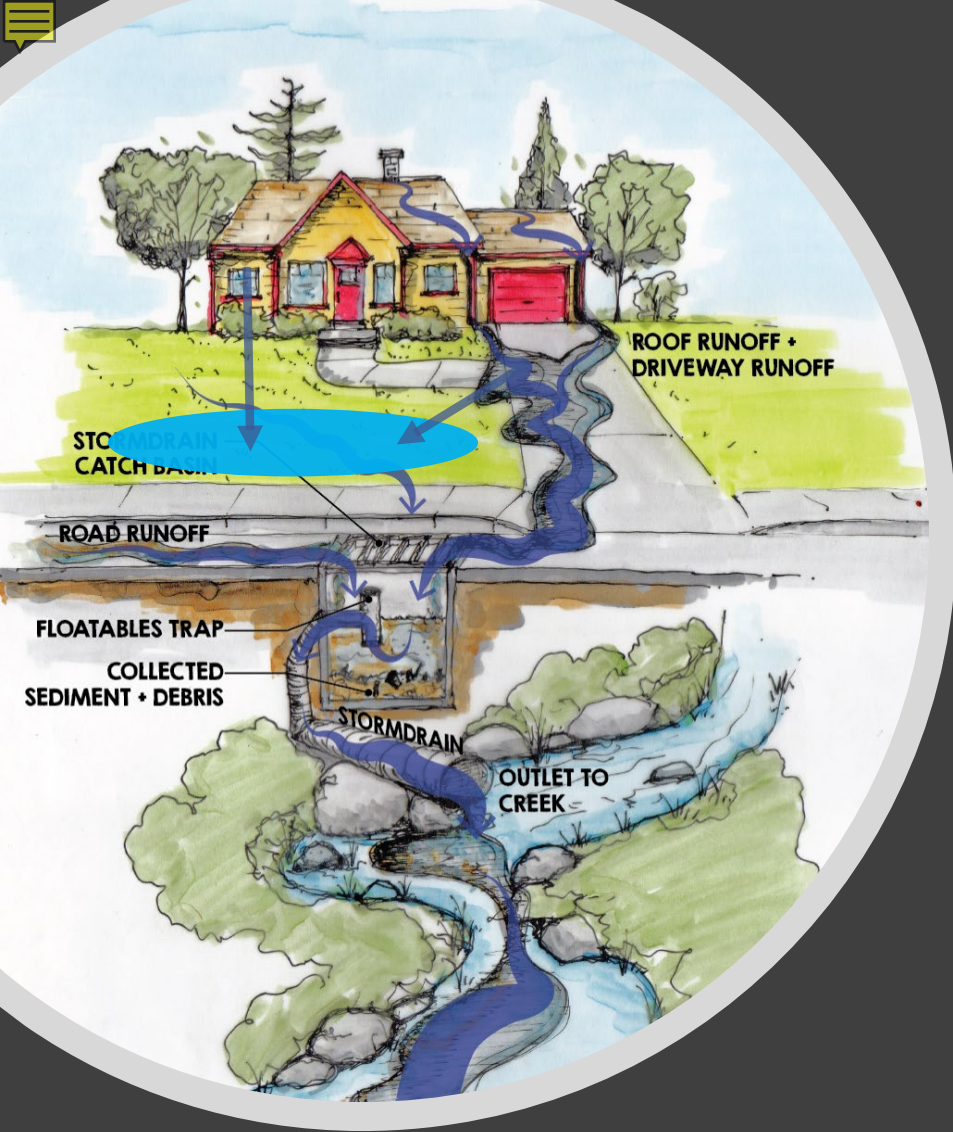directly and indirectly
annually.

(Western Washington and Oregon
Community Tree Guides, 2002)

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Designing Green Space for Climate Change Adaptation

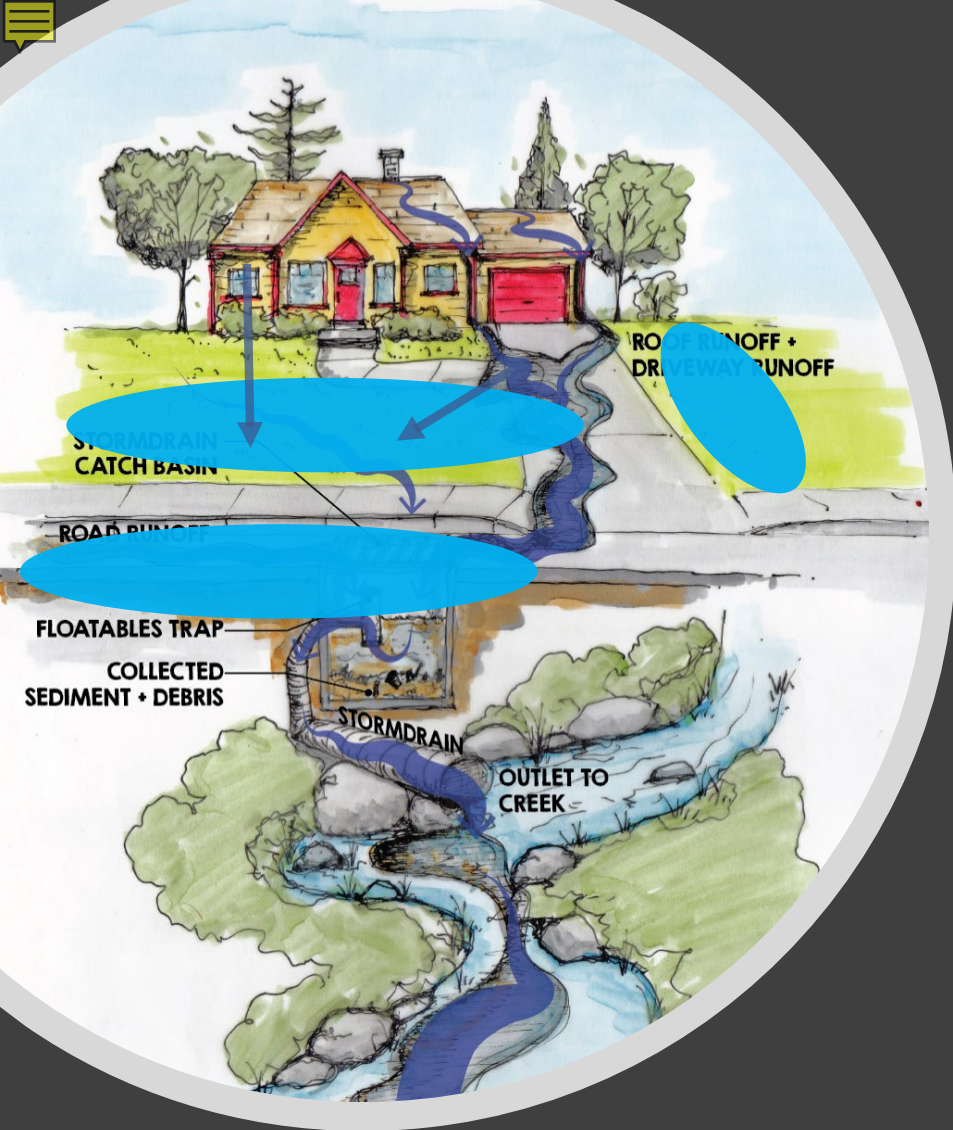## *Integrating natural functions in urban landscape*

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'Old School' Approach to Stormwater Management

runoff directed quickly from impervious surfaces to infrastructure and then to marine environments

Current Best Practice

runoff directed first to landscape

BUT there is often not enough room!! Impervious surfaces (buildings, parking, driveways, walkways, etc) are priorities.

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Future Best Practice

We need a shift in values!

Management of stormwater needs to be a 'essential' rather than 'nice to have'

Functional Landscape: Impacts and Value in Urban Areas

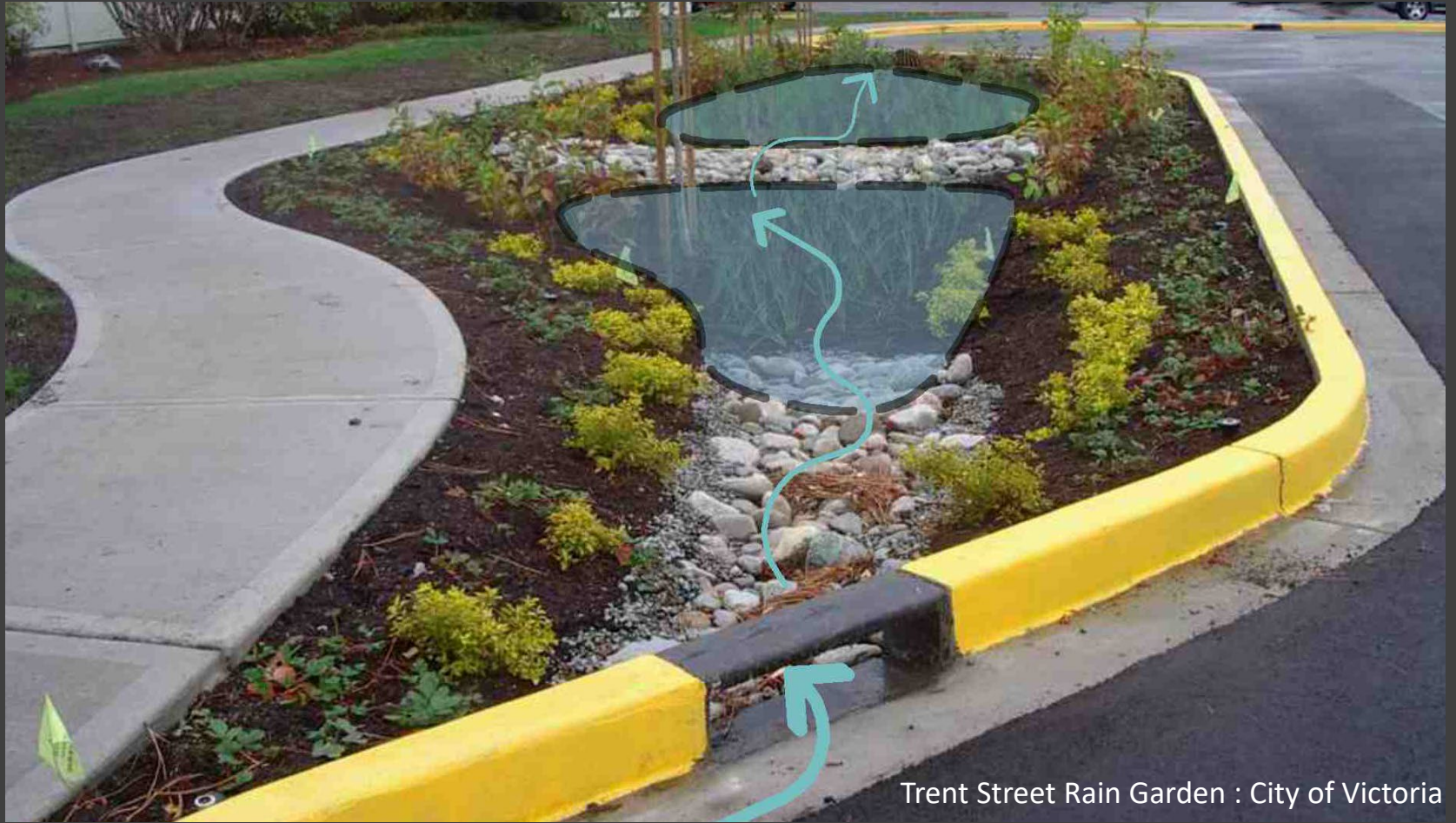Integrating green infrastructure into our urban landscape contributes to:

- Increased capacity of existing infrastructure
- Extended life of existing (aging) infrastructure
- Incremental adaptation to climate change impacts
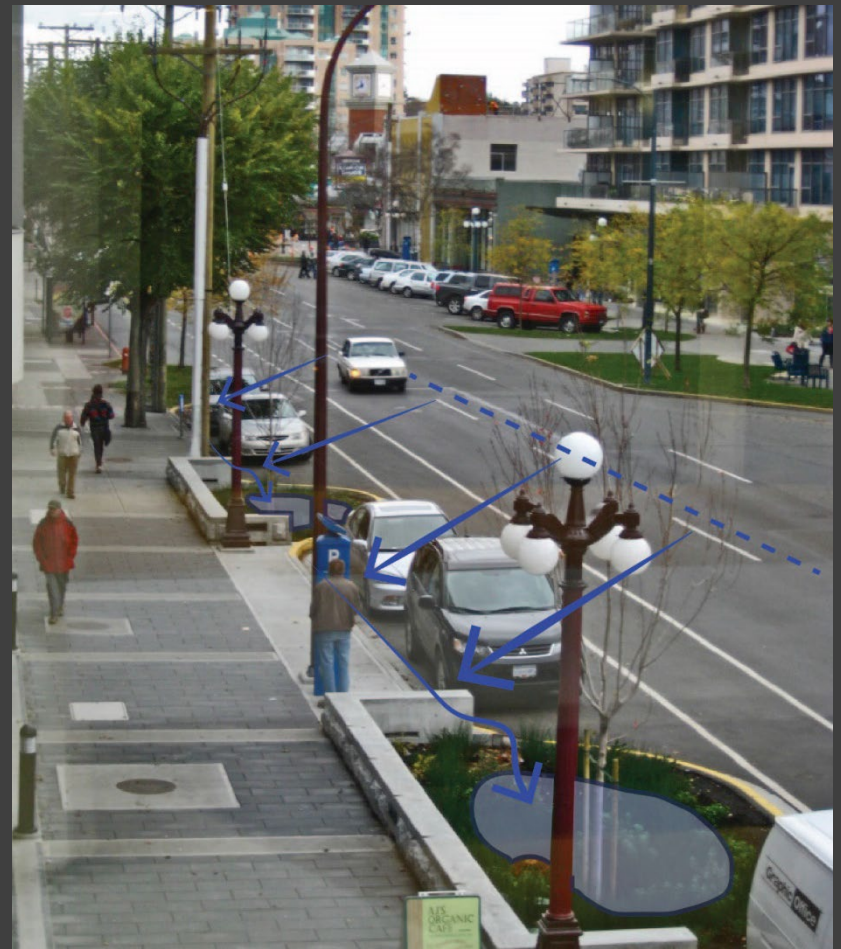
Oaklands – Forward 50

30 October 2019

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Functional Landscape in Urban Streets

Trent Street Rain Garden : City of Victoria

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Functional Landscape in Urban Streets

Atrium Building (800 Yates St)
Victoria, BC

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Functional Landscape in Greenways

Cecilia Greenway Rain Gardens-City of Victoria

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Bell Street Park, Seattle
Source: SVR

Atrium Building – Jawl Properties

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Functional Landscape in Residential Landscape

Residence
Saanich, BC

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Residence
Saanich, BC

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Functional Landscape in Residential Landscape

Miles House
Source: thinkmakebuild (via Instagram)

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High Point Redevelopment, Seattle WA
Source: SVR

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Functional Landscape in Public Parks

Oswald Park
Victoria, BC

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Functional Landscape in Public Parks

Fisherman's Wharf Park
City of Victoria

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Functional Landscape in Public Parks

Fisherman's Wharf Park : City of Victoria
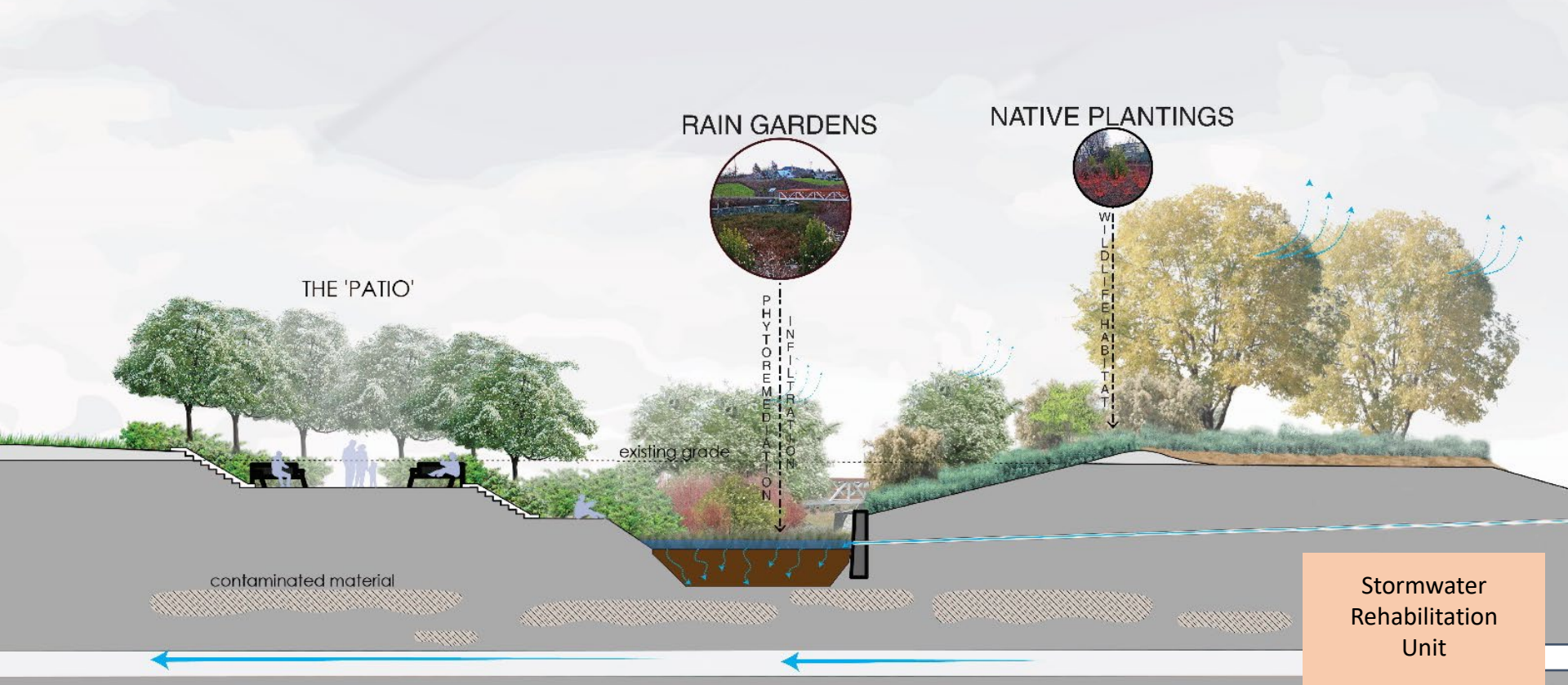
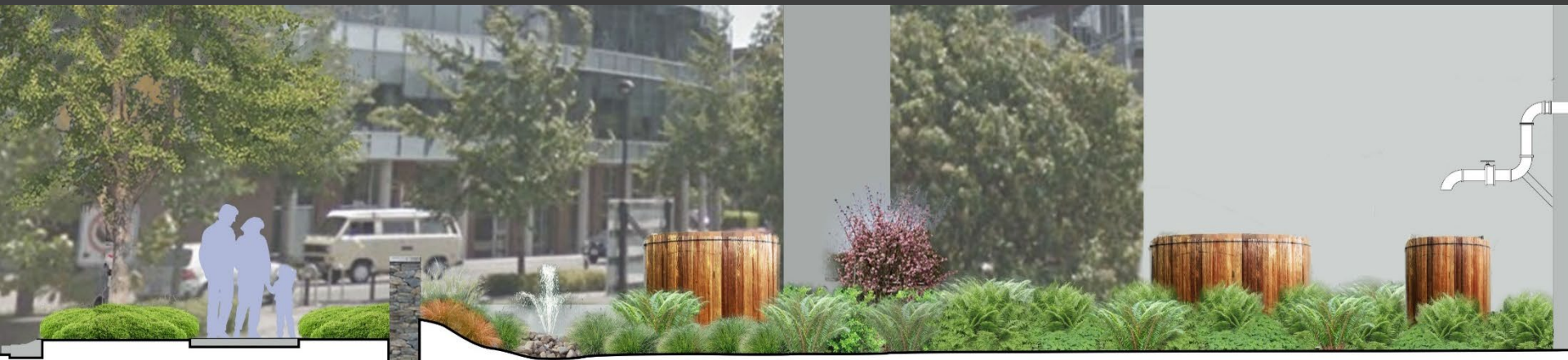Bridget Joyce Square, London UK
Source: landezine-award.com

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Source: watershed.org

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Functional Landscape in Residential or Mixed Use Developments

Reliable Controls, View Royal BC

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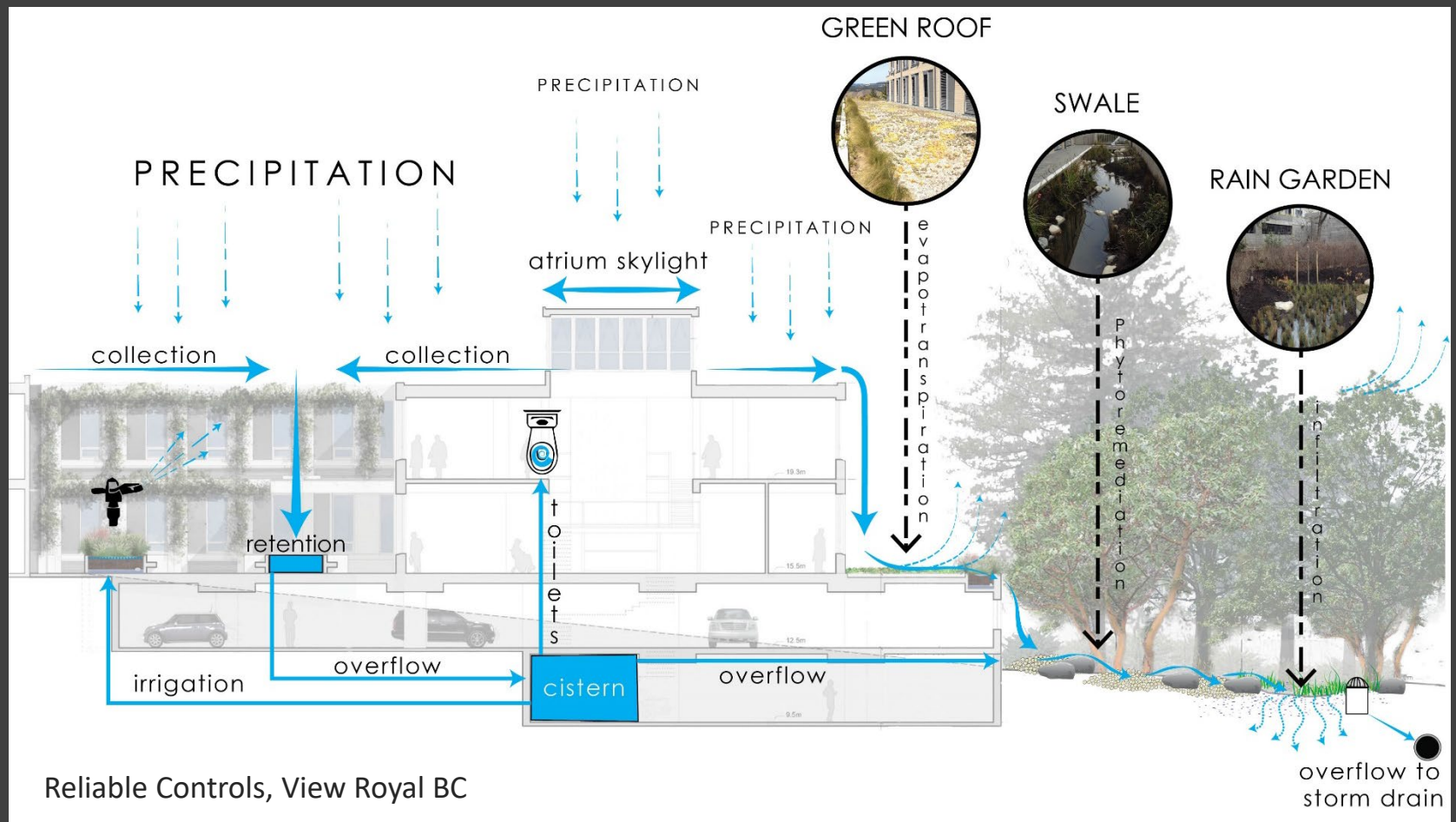
2950 Jutland Road, Victoria BC

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Anacortes, WA
Source: Flickr user -jon

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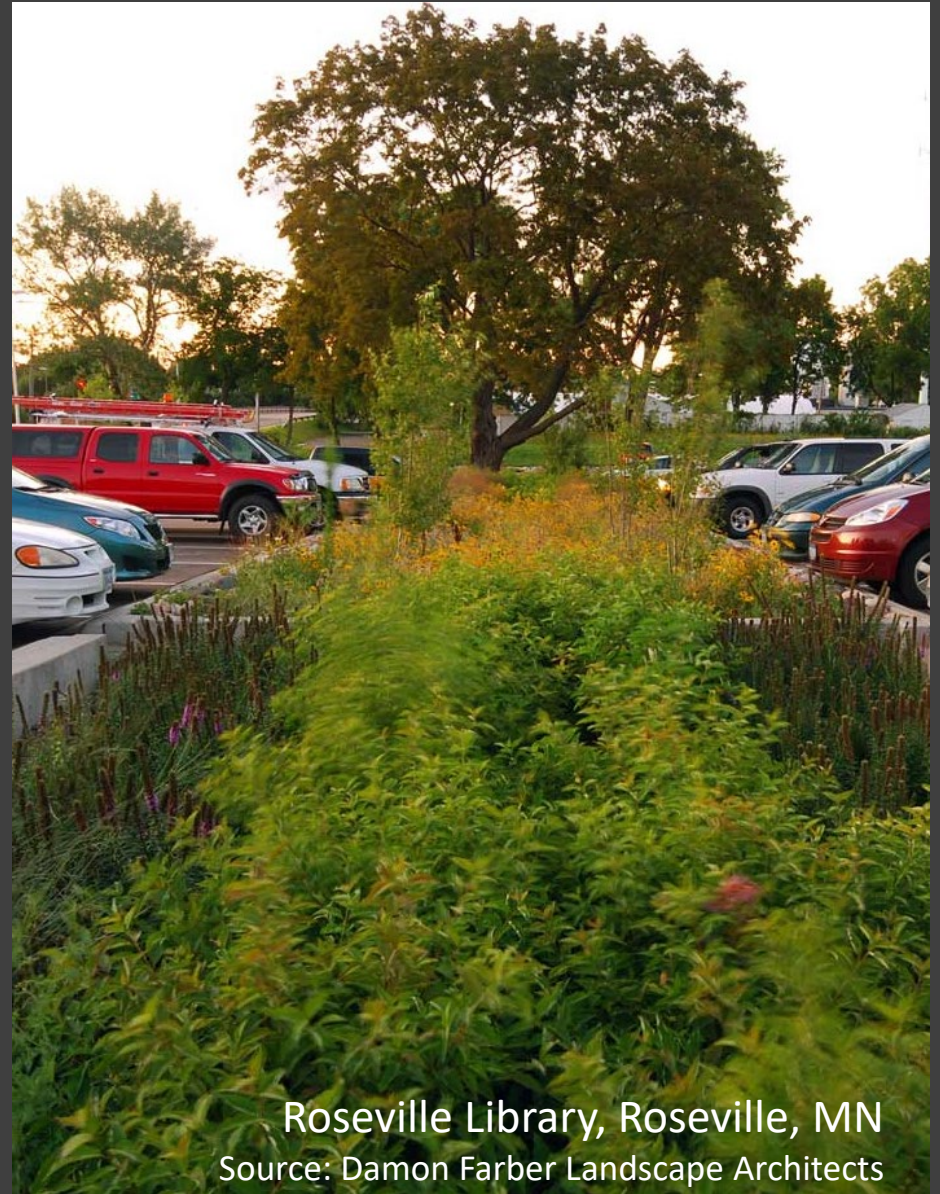
Roseville Library, Roseville, MN
Source: Damon Farber Landscape Architects

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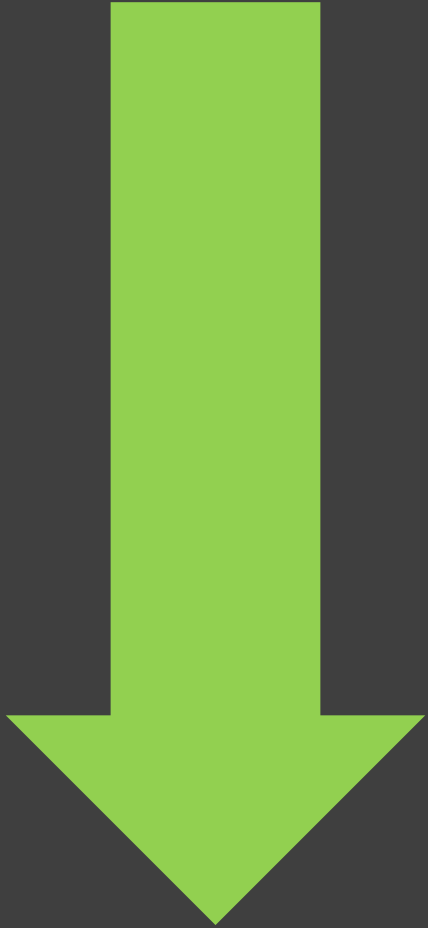de Greeff INC

2019

2045

2070

Incremental climate change adaptation with urban green space.

Forward 50 – Integrating 'green' in a meaningful way

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