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Thoughts on the Role of Standards in Flood Resilient Stormwater Management

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AFFILIATIONS

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Past President, Alberta Low Impact Development Partnership



PROFESSIONAL INTERESTS

Urban stormwater analysis, hydraulic design, sustainable development, water resources engineering

CSA Group Standards

AREAS OF FOCUS

- Established in 1919
- 10,000 dedicated members
- ~1,115 Standards Technical Committees
- Accredited, balanced, consensus-based approach
- 12 areas of focus



Ensuring the right people are involved, the right voices are heard, and the right process is followed

Types of Flooding



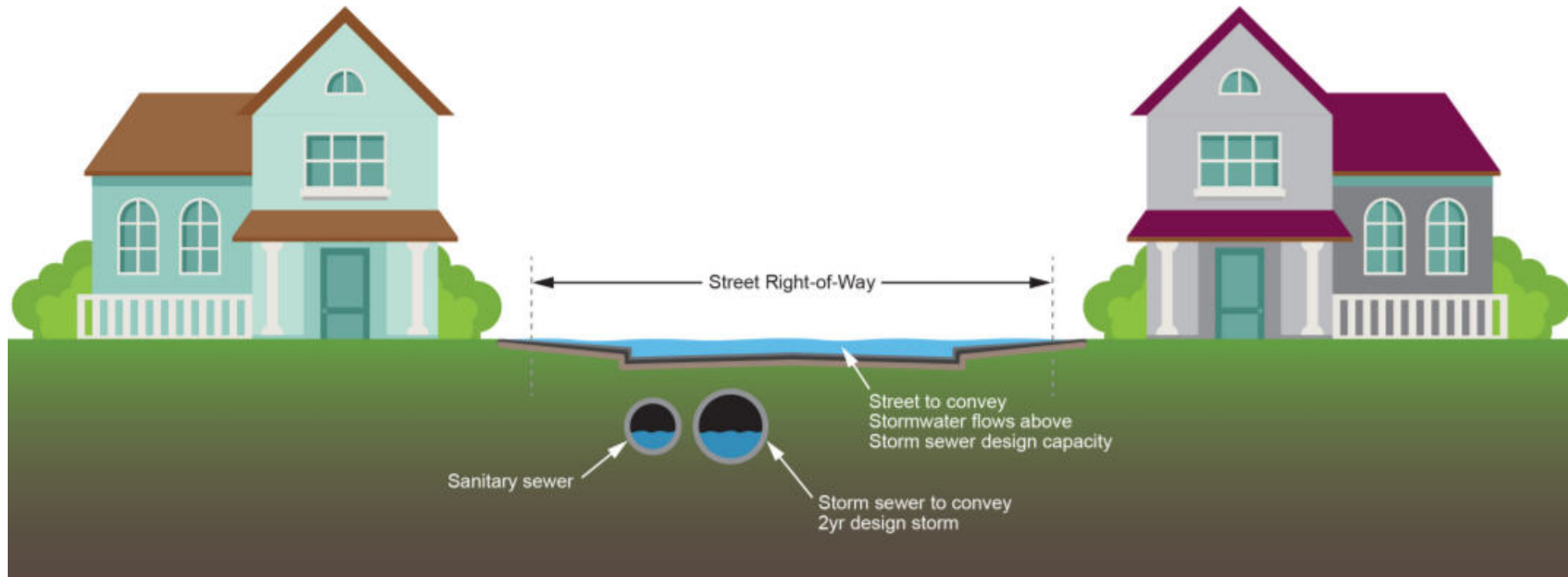
- Riverine Flooding
- Creek or Small Stream Flooding
- Subdivision Flooding



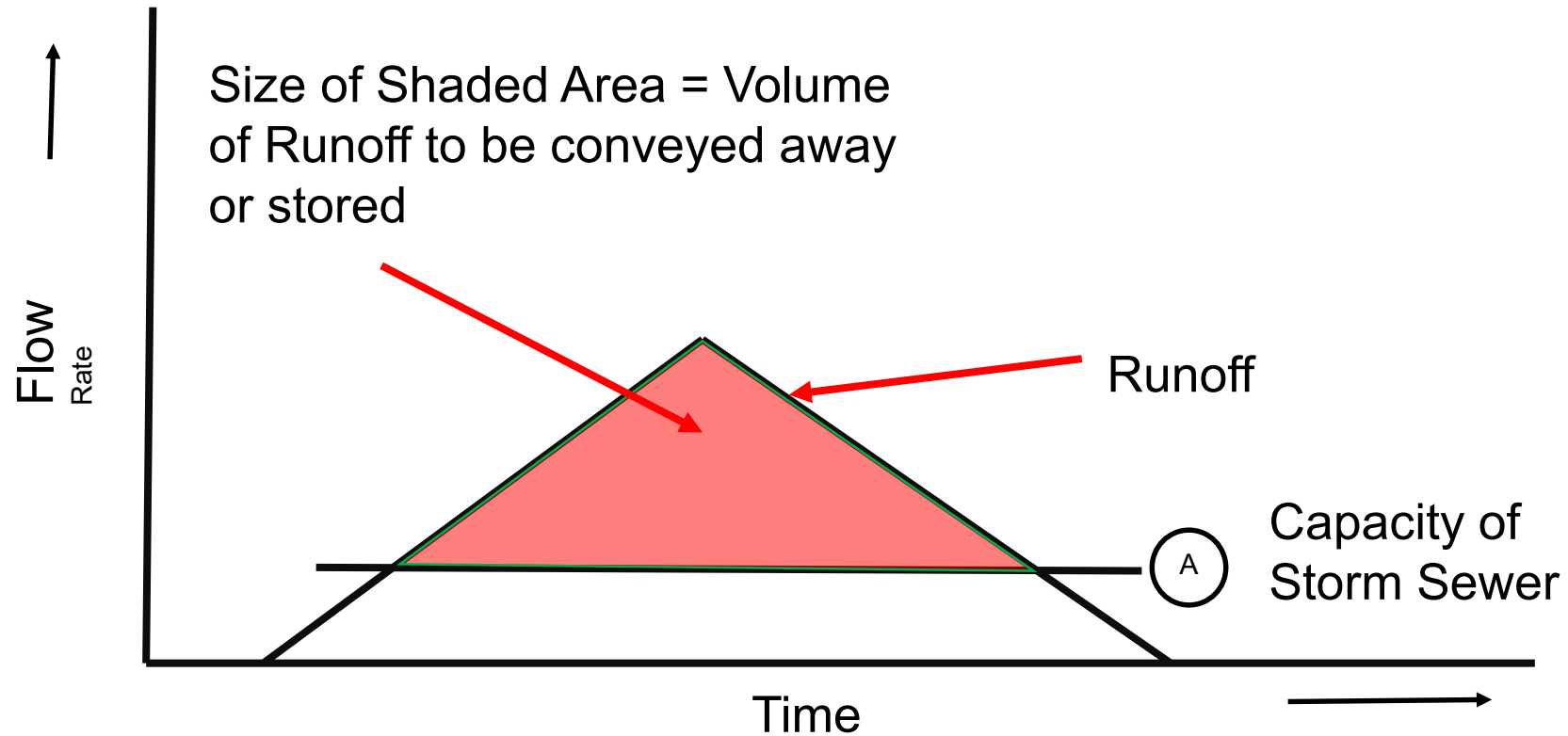
Storm System - Dual Drainage System

Major (streets) and Minor (sewer pipes)

- Storm sewers (minor system) convey up to 1 in 2 year storms.
- Streets (major system) convey major storms that exceed the storm sewer capacity.
- Temporary ponding on streets is expected during major rain storms.



Fundamentals of Stormwater Management

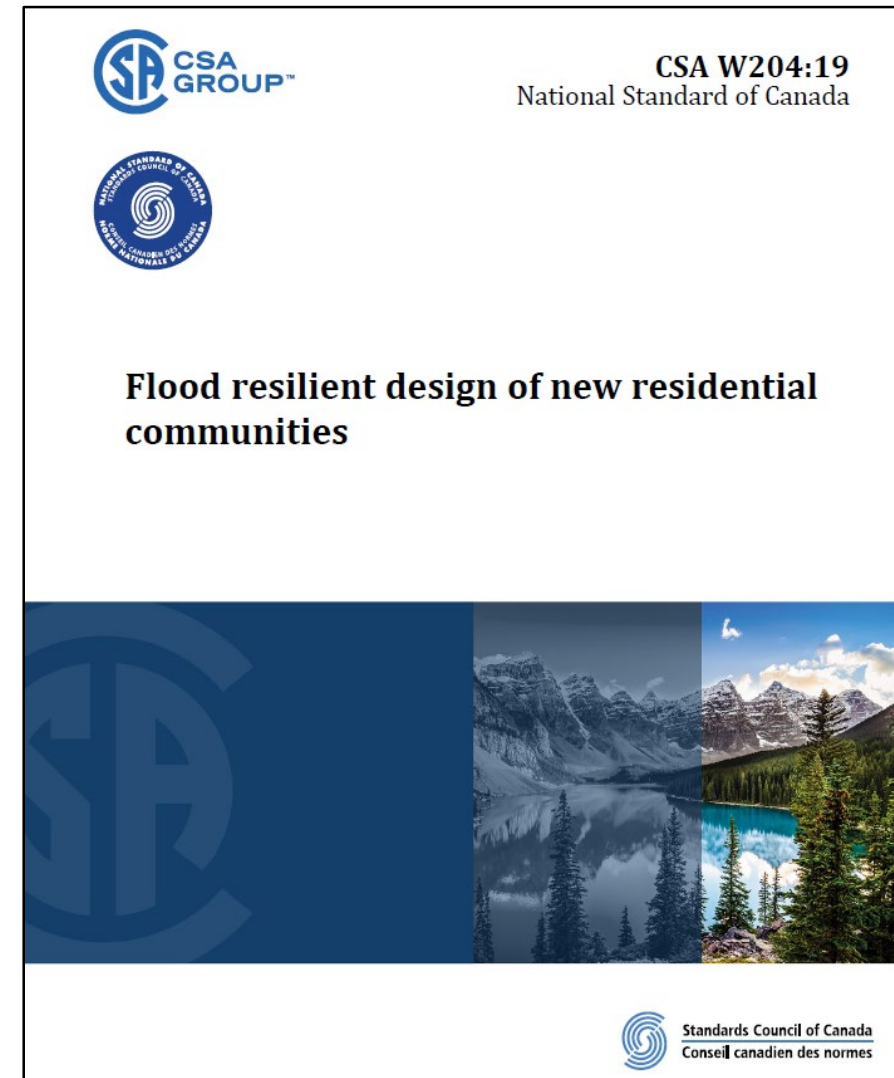
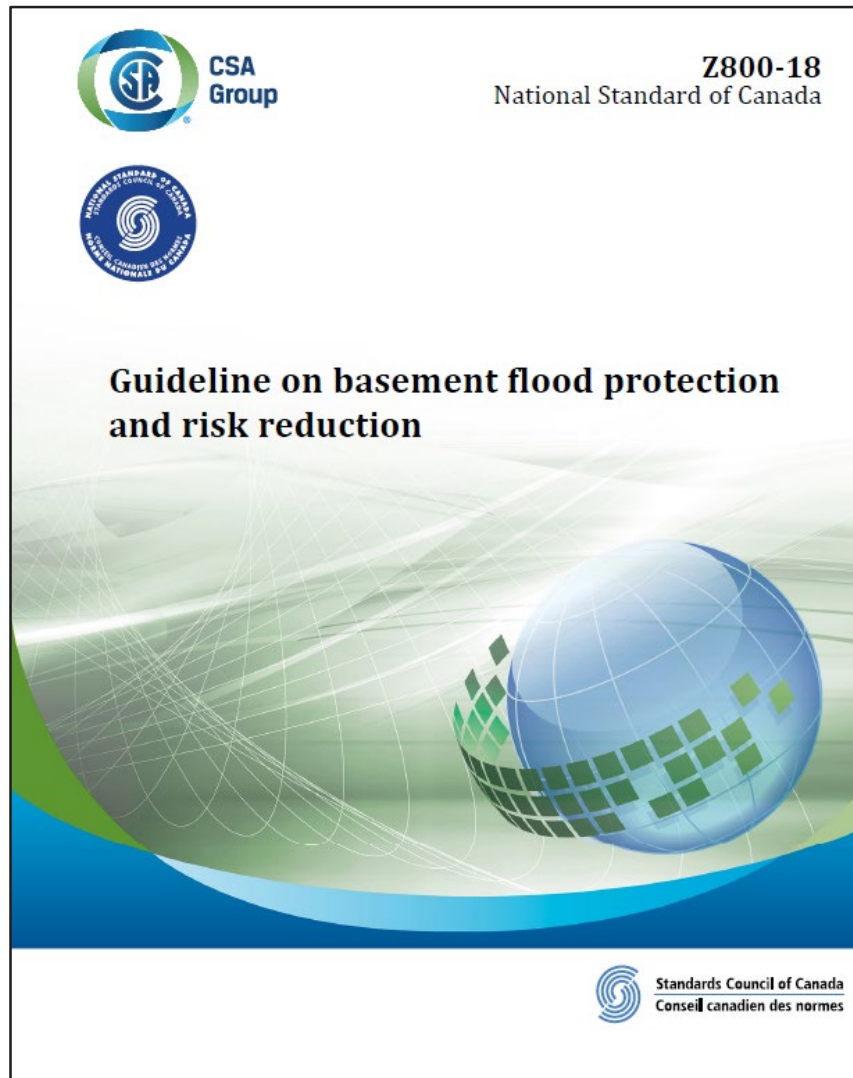


Types of Storage in our Communities

- Storage can be above ground or below ground
- When provided for an entire community it may help address the creek or small stream flooding



Two Standards for Flood Resilient Design of New Residential Communities

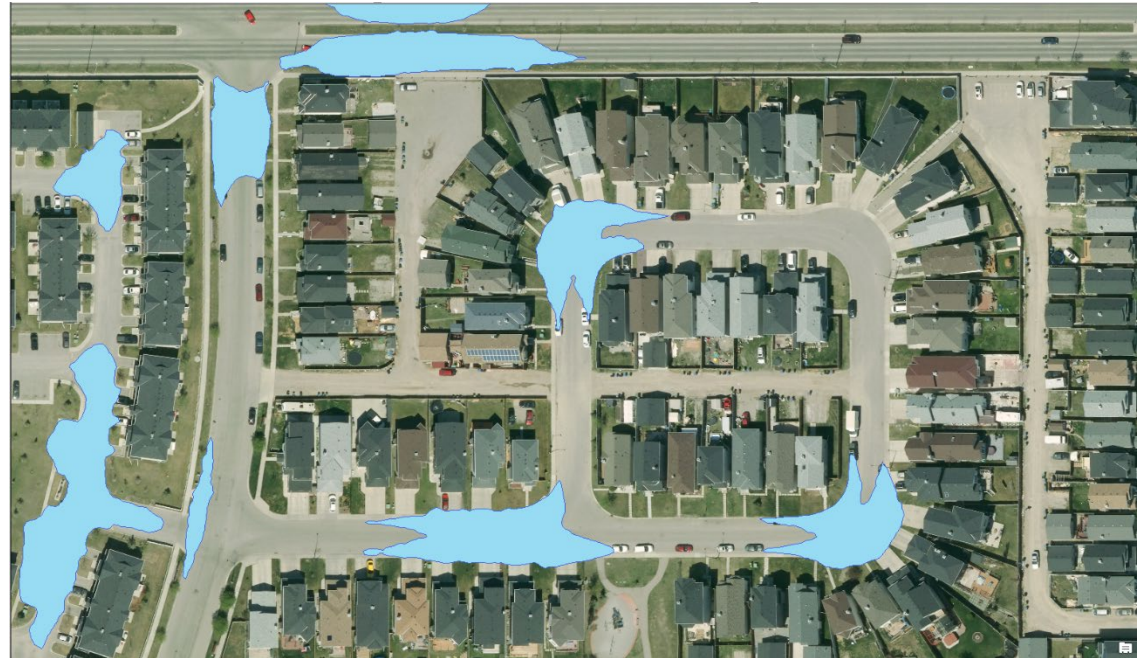


Needed interpretation



People should not get penalized in their insurance rates

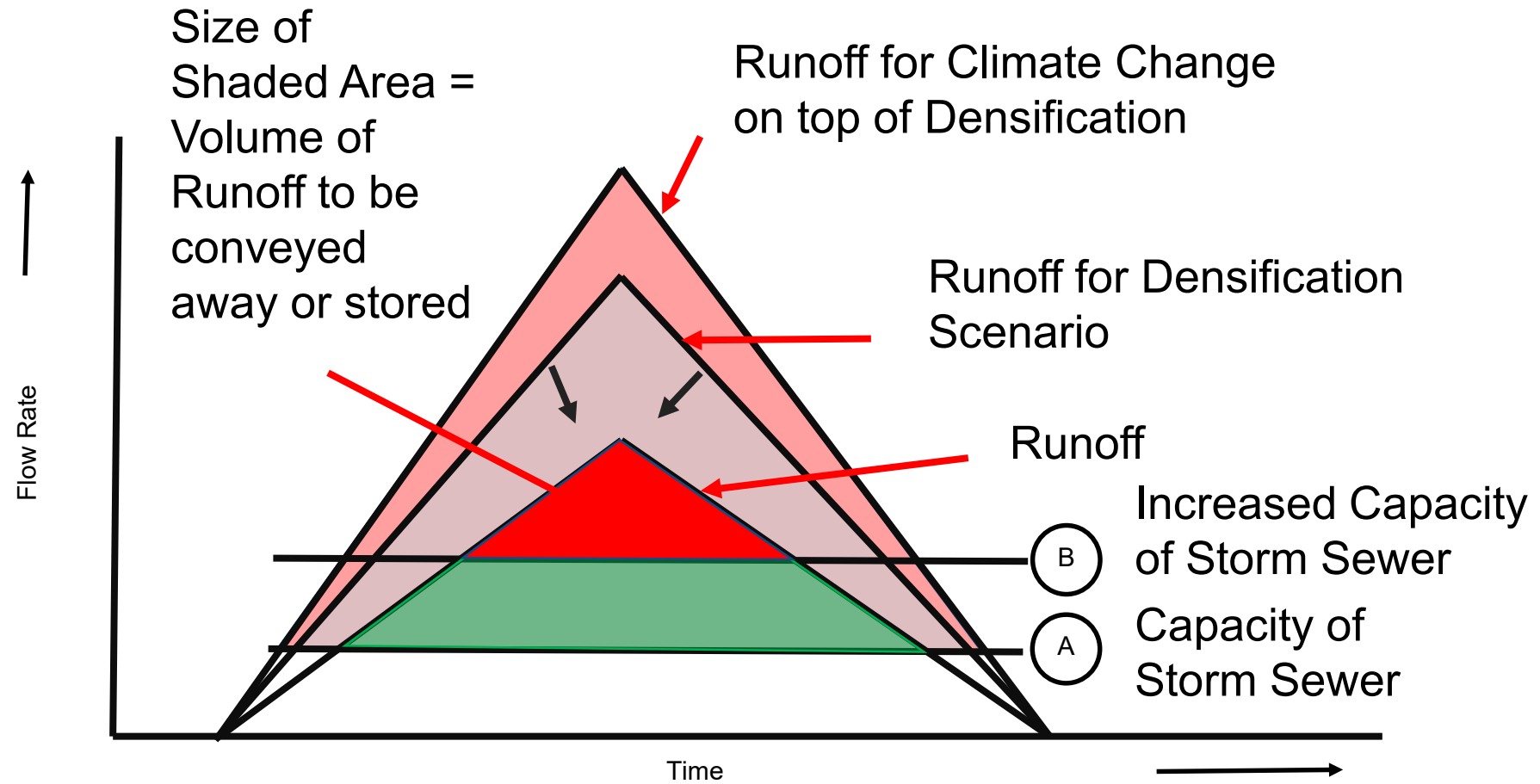
When analyzed properly the surface inundation will be restricted to the intended flooding areas along our roadways or in parking lots.



What about Flooding in Older, Existing Communities?



Fundamentals of Stormwater Management



Some help has been made available



WEATHERING THE STORM:
DEVELOPING A CANADIAN STANDARD FOR
FLOOD-RESILIENT EXISTING COMMUNITIES

NATALIA MOUDRAK AND DR. BLAIR FELTMATE
INTACT CENTRE ON CLIMATE ADAPTATION
JANUARY 2019



CHERYL EVANS AND DR. BLAIR FELTMATE | INTACT CENTRE ON CLIMATE ADAPTATION | APRIL 2019

GENEROUSLY SUPPORTED BY:
UNIVERSITY OF WATERLOO INTACT CENTRE ON CLIMATE ADAPTATION [intact] Ontario IBC BAC TORONTO Burlington

UNIVERSITY OF WATERLOO
INTACT CENTRE ON CLIMATE ADAPTATION

**AHEAD
OF
THE
STORM**

Flood-Resilience Guidance
for Canada's Commercial Real Estate

[intact] REALPAC BOMA

Natalia Moudrak and Dr. Blair Feltmate
Intact Centre On Climate Adaptation

October 2019

Role of Green Infrastructure

Soil Cell



Permeable Pavement



Green Roof



Stormwater Capture/Use



Bioretention



Reduced Hard Surface



Rain Garden



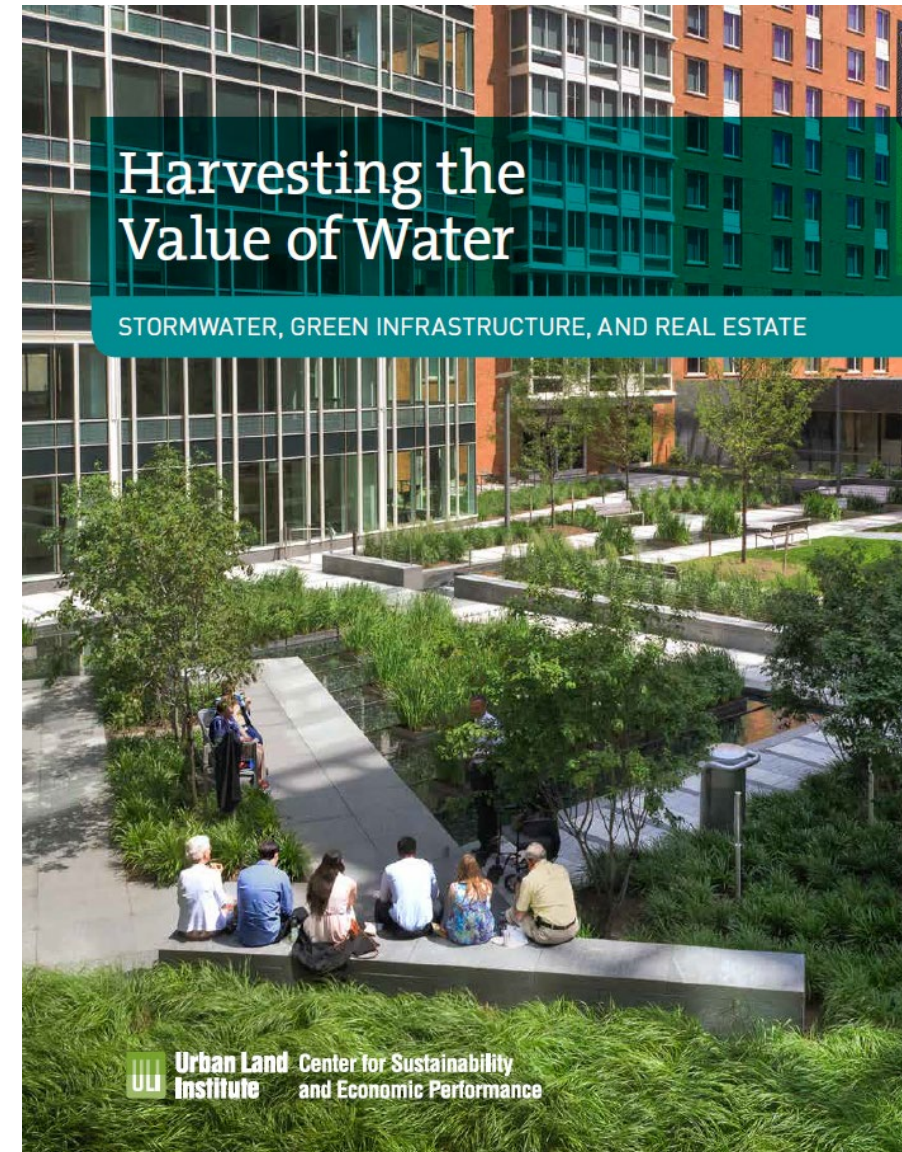
Rainwater Harvesting



Credits: Alberta Low Impact Development Partnership and Southern Alberta Institute of Technology

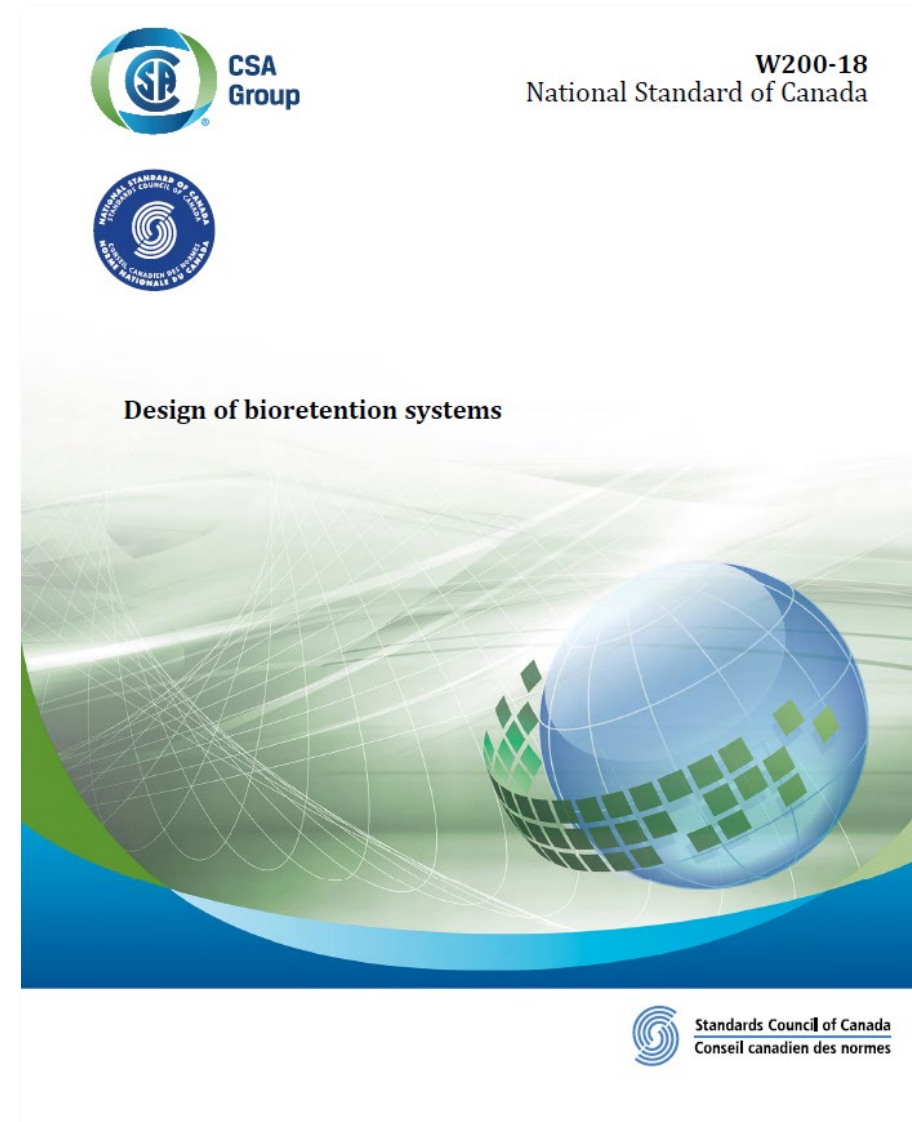
Role of Green Infrastructure

After outlining the reasons that stormwater management is important to cities, this report introduces a series of real estate case studies, and a range of stormwater policies. The case studies come from locations across the United States and present both innovations in stormwater management and positive financial, operational, or design outcomes.



Role of Green Infrastructure

- We need a comprehensive toolbox of both conventional grey and green approaches
- Concerns expressed that insurers may have created barriers to the implementation of green approaches
- Appropriate standards are needed
- CSA has issued two bioretention standards but more are needed



Wide Perspective needed

- It is crucial that these standards reflect the diversity in green infrastructure across Canada
- This is a reflection of the variability in climate and hydrologic conditions across the country

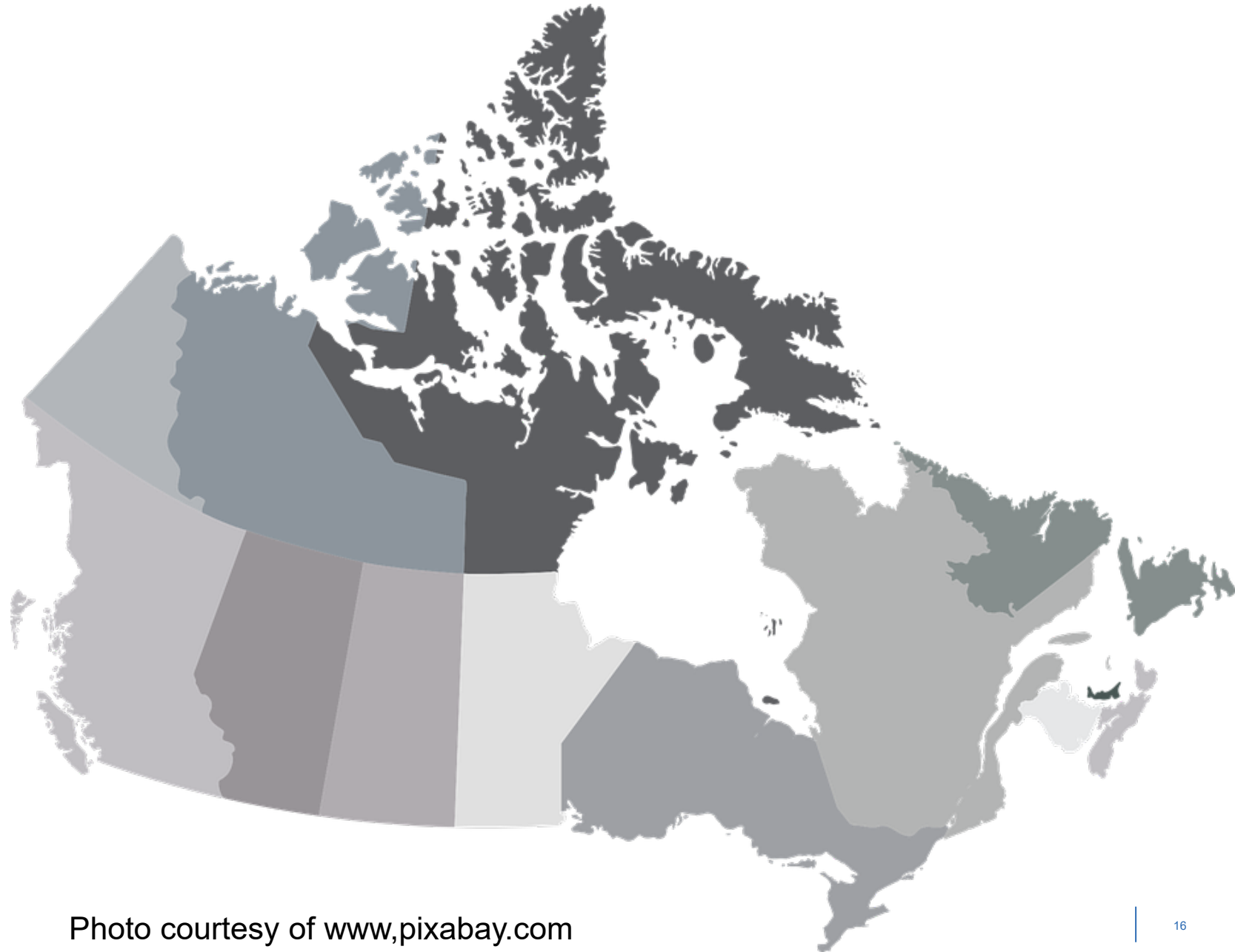


Photo courtesy of www.pixabay.com

Municipal Concerns

- Stormwater management has to address many other objectives as well (e.g., water quality, stream erosion, source water protection, groundwater recharge)
- Funds needed to cover mapping of riverine, small stream and pluvial community flooding and infrastructure upgrades
- Potential for societal unrest when maps are released
- Credit should be given as to when and where infrastructure upgrades are being implemented
- Lack of expectations re Level of Service in older communities
- Standards are needed, but even more so the understanding of what they reflect. Given Canada's diversity they cannot be a cookbook.
- Education is paramount
- Definition of what constitute assets may be a barrier

Opportunities to Collaborate

- Advocate for funding to cover mapping and infrastructure upgrades
- Dialogue on how infrastructure upgrades can be reflected in reduced insurance rates
- Support preparation and implementation of new standards
- Support preparation of cost-benefit analysis or triple bottom line tools
- Support research into innovative stormwater management, reflecting the diversity across Canada
- Support educational initiatives, specifically of citizens and businesses

Thank You



Thank you for your time,
attention and interest!!

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purposes only.