

# RAIN CITY STRATEGY

a green infrastructure &  
urban rainwater management initiative

November 1, 2017



# Vancouver is a city surrounded by water







The water is where we  
play and enjoy nature





Over time the  
natural watersheds  
have changed...



to allow residents and businesses to  
prosper and grow



Image: View of Yaletown from Charleson Park in 2013, Vancouver  
Photo Credit: Wendy de Hoog



Think  
strategically  
about  
adapting for  
the future

## Resilience

- Heavy rain events
- More frequent heat waves
- Flood risk & sea level rise
- Water supply & demand
- Shocks & stressors

## Water Quality

- Combined sewer overflows
- Urban rainwater run-off

## Livability

- Cohesive communities
- Physical activity
- Biodiversity
- Wellbeing



# Resilience

## Climate change impacts

'Coastal Cities at Risk' project ranked Metro Vancouver **11th** most vulnerable in the world for exposed assets

*Organization for economic co-operation and development (OECD), 2013*

Kitsilano pool





# Models predict

## Decrease in snowpack in drinking watersheds

### WARMER WINTERS



58%  
decrease in  
snowpack

WHICH MEANS

increased  
risk of  
summer  
drought



minimum  
temp goes  
up by

4.8°



29%  
reduction  
in home  
heating  
needs

increased risk  
of coastal flooding



because of king tides  
and stormy weather

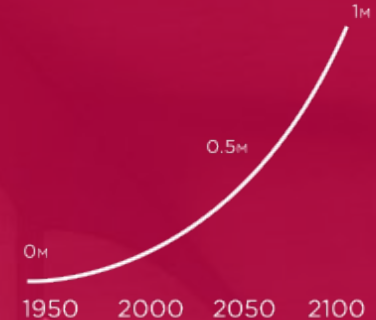


# Models predict

Sea level rise of  
1 meter by 2100  
and 2 meters  
by 2200

## HIGHER SEA LEVELS

Sea levels may rise  
0.5 metres by 2050



Sea level rise  
contributes to  
increased  
flood risk



Coastal habitat  
for birds and  
fish may shrink





# Models predict

More intense rain storms  
like on October 12, 2017

## WETTER AUTUMNS

heavy  
rain  
events  
35%  
more  
intense



21%  
more  
rain  
on the  
wettest days



WHICH MEANS

a  
higher  
flood  
risk





# Models predict More extreme heat

## WARMER SPRINGS

15%  
longer  
growing  
season



72%  
decrease  
in frost days

snow  
melts  
earlier



20%  
increase  
in April  
showers

## HOTTER SUMMERS



more  
frequent  
heat  
waves

hottest  
days  
even  
hotter



twice as  
many  
days  
above  
25°C

WHICH MEANS

increased  
health risks  
to vulnerable  
people



20%  
less rain

increased  
water  
restrictions






# Water quality

## Regulatory requirements

- (1) No combined sewer overflows by 2050
- (2) Implement integrated rainwater management plan (IRMP)
- (3) Improve water quality

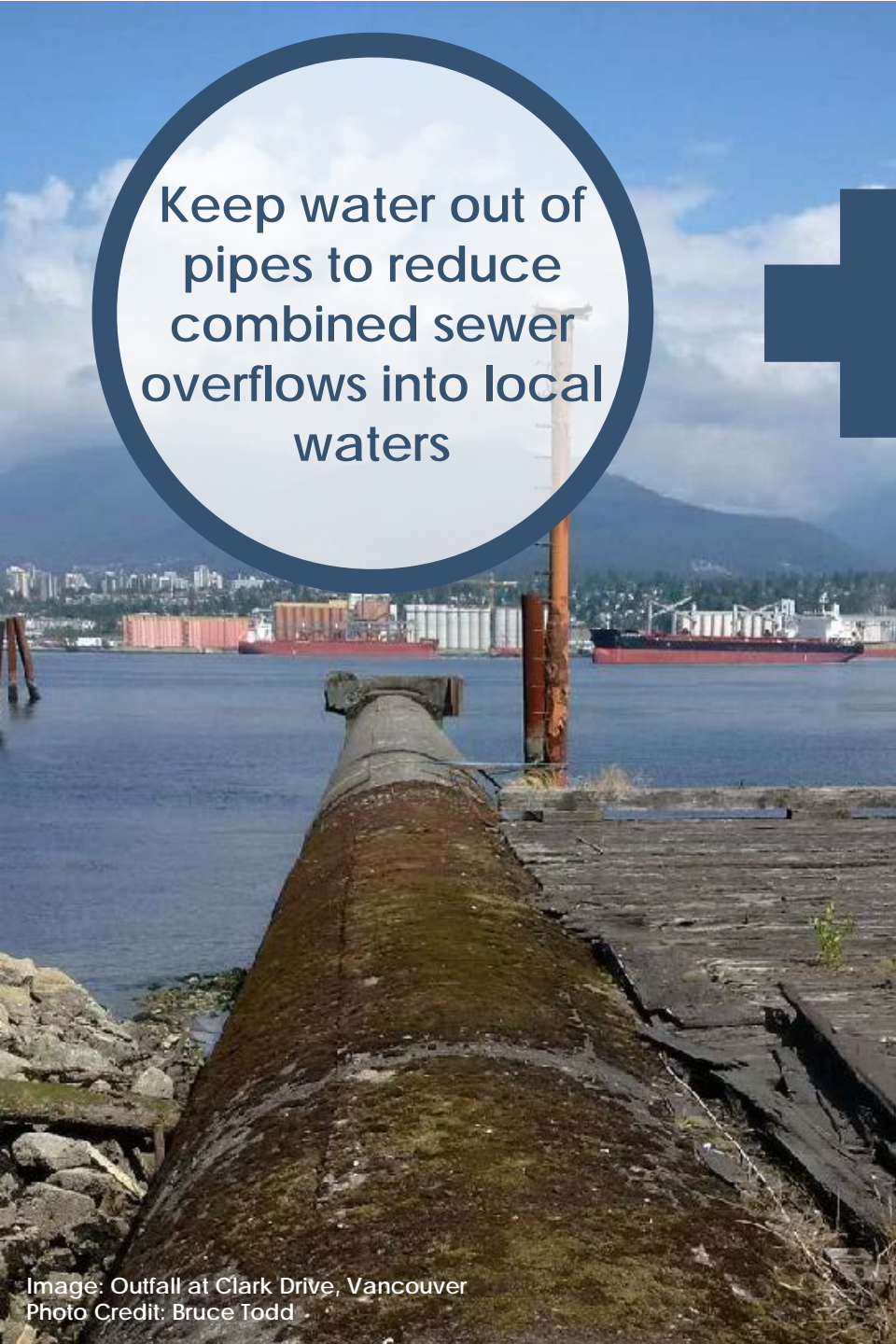




Keep water out of  
pipes to reduce  
combined sewer  
overflows into local  
waters

Reduce  
pollutants in  
urban rainwater  
run-off

(gasoline, motor oil,  
heavy metals,  
sediments, litter,  
organics & fertilizer)





## Grey Infrastructure

Less adaptable

Single purpose

Limited integration with  
other City priorities



## Green Infrastructure

Adaptable

Multi purpose

Leverage co-benefits for  
other City priorities



evapotranspiration



infiltration



harvest & reuse



# Livability

Investments  
made in bringing  
nature back into  
the city will  
benefit people  
and our  
future resilience

Image: Winter in Oudolf's frosted Hummelo garden in the Netherlands  
Photo Credit: Hummelo: A Journey Through a Plantsman's Life





# Green infrastructure has a positive impact

Promotes  
wellbeing

Mitigates  
pollution  
& reduces  
flooding

Enhances  
biodiversity

Inspires  
physical  
activity

Strengthens  
social ties



# Green infrastructure

Uses vegetation, soils and other engineered systems and practices to mimic natural processes required to manage water and create resilient and healthier urban environments







Rain garden



Non porous asphalt

Porous asphalt



Tree soil cells



Green roof



Street car





Absorbent landscape



Day-lighting streams



Rainwater harvesting



Detention tank



Wetland



Bioswale



# Today

## 190

Existing public realm green  
infrastructure practices

## 60+

Public realm practices  
being pursued

## 55%

Impervious area (citywide scale)

## 45%

Pervious area (citywide scale)

**Target:**  
To capture and  
clean 90% of  
rainfall on both  
public and  
private property



# Implementation planning

Developing an  
outlook for rainwater  
management to 2050





## Scoping the implementation plan

- (1) Tools (what, why, where, to what extent, when in next 30 yrs)
- (2) Delivery models

## Mechanisms

- (1) Policy
- (2) Regulation
- (3) Design standards
- (4) Operating procedures
- (5) Retrofit & enabling programs
- (6) Community partnerships
- (7) Incentives





Climate  
Adaptation  
Strategy

Urban  
Forest  
Strategy

Comprehensive  
City Building &  
Capital Planning  
Framework:  
30 yr Strategic outlook

Resilience  
Strategy

Habitat &  
Biodiversity  
Strategy

Greenest City  
Goals:  
Green economy  
Green buildings  
Green transportation  
Access to nature  
Clean water

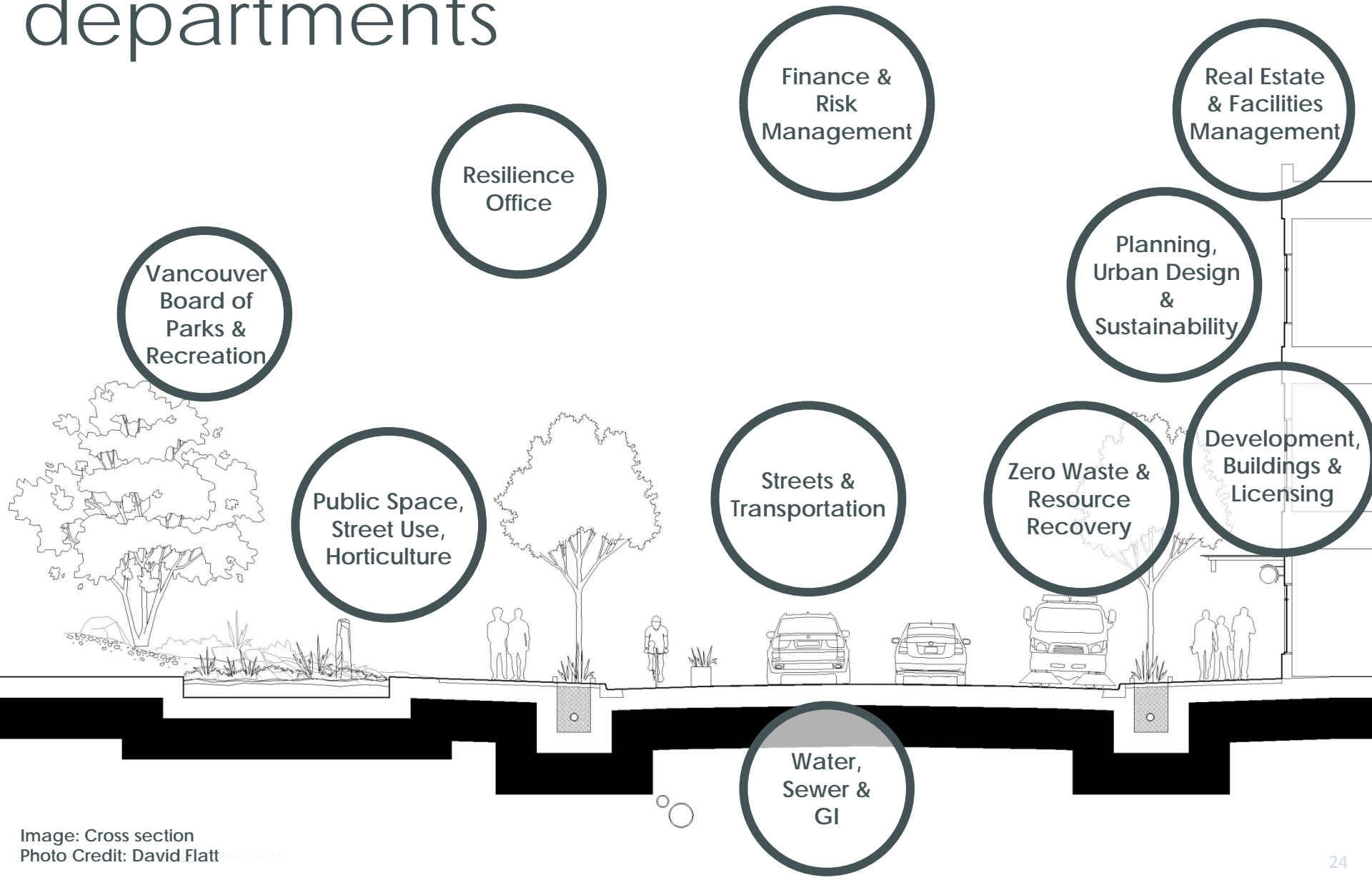
Water  
Conservation  
Strategy

Healthy  
City  
Strategy

Intersection with  
a great number  
of city initiatives



# Collaboration with other departments





Counters water  
conservation  
message and  
misrepresents  
climate change  
impacts

Emphasize  
rainwater as  
resource for  
community and  
natural  
ecosystems

## Current vision

Vancouver's  
**abundant** rainwater  
is celebrated  
as a **resource**





## Proposed vision

Vancouver's rainwater is embraced as a valued resource for our communities and natural ecosystems



# Proposed goals



Improve and  
protect Vancouver's  
**water quality**

Increase Vancouver's  
**resilience**  
through sustainable  
water management

Enhance Vancouver's  
**livability**  
by improving natural  
and urban  
ecosystems



# Proposed objectives





# Engagement

Will start this Fall  
to help raise  
awareness &  
shape the  
implementation  
plan





# Engagement process

A photograph of three young women participating in a community gardening project. They are crouching in a garden bed, planting small green seedlings into the soil. The woman on the left is wearing a blue denim shirt and a backpack. The woman in the middle is wearing a blue hoodie with 'GANG 1977 MTN' printed on it and pink gloves. The woman on the right is wearing a black hoodie, glasses, and grey gloves. In the background, another person in a red shirt is visible, and there are more plants in black pots. The scene is outdoors with trees and a building in the distance.

**FALL**

Raising public  
awareness  
about rainwater  
& forming expert  
panel


**BEGINNING  
2018**

Share ideas about  
urban rainwater  
management

**JUNE 2018**

High level  
implementation  
plan





In nature  
nothing exists  
alone.

– *Rachel Carson*