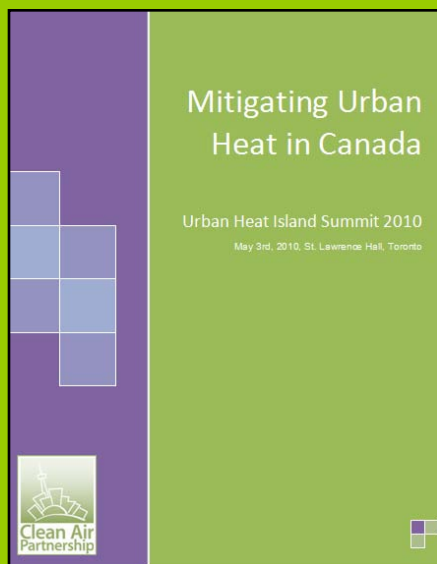


# National overview of municipal efforts to reduce the urban heat island effect



Jennifer Forkes  
Clean Air Partnership

2010 Urban Heat Island Summit - May 3, 2010

# Scope and Community Selection

- national scope
- large urban population
- already experience July mean daily temp.  $>25^{\circ}\text{C}$
- likely to see increase in number of days  $>30^{\circ}\text{C}$
- 36 reviewed and/or interviewed during Winter 2008-09
- planning, environment/works and parks/rec staff



Modified from GoogleMaps

# Looking for policies and programs

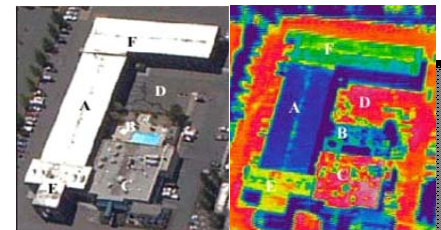
- High albedo and high emissivity materials
- Trees and other vegetation
- Green infrastructure (green roofs, pervious surfaces etc.)
- Reducing anthropogenic heat and air pollution
- Changes in urban form
- Official Plan
- Secondary Plans
- Parks and Recreation or other Master Plans
- Bylaws - Zoning
- Bylaws - Regulatory
- 'Green' Building Standards
- Design Guidelines
- Incentive Programs
- Demonstration and Pilot Projects
- Building and Energy Codes

# In general...

- very few indicate UHIE reduction as main objective
- many to protect/increase # of trees, vegetative/pervious surfaces and green space
- many to reduce energy use; may lead to lower anthropogenic heat emissions and less air pollution
- multiple communities adopting corporate 'green' (LEED or similar) building standards; some have incentives for private developments to adopt green design features
  - but final projects do not necessarily include UHIE reduction measures
- almost none address urban form contributions

# HIGH ALBEDO/EMISSIVITY MATERIALS

- Green Building Standards
  - corporate (and private) green building policies
  - Edmonton Sustainable Building Policy
  - Toronto Green Standard
- Voluntary Action Incentives
  - floor area ratio and height and density bonus incentives; share portion of incremental costs and fees
  - Hamilton LEED Grant Program
- Informal encouragement



# TREES AND VEGETATION



- Official Community, Secondary/Master Plans
  - canopy targets, tree planting commitments, parkland creation, 'open space' and natural heritage
- Tree Planting Programs
  - municipal street trees, parkland/ravines
  - free or discounted trees for residents



- Tree Protection Bylaws (Regulatory)
  - permits for removal of trees
  - Hamilton and Brantford Tree Bylaw ‘suites’
- Landscaping Requirements and Guidelines
  - parking lots, sidewalks and boulevards, public or private development landscaping
  - Toronto “Design Guidelines for Greening Surface Parking Lots”



# GREEN ROOFS AND WALLS

- Green Building Standards
  - corporate and private devel. policies
  - specific GR requirements
- Voluntary Action Incentives
  - development bonuses, cost sharing/offsetting programs
- Stormwater Management Master Plans, Bylaws and Design Guidelines
  - GR option for on-site retention
- Demonstration Projects
  - high profile buildings, academic institutions; research opportunity



Source: Xeroflor.ca



Darling Foundry, Montreal

# ALTERNATIVE STORMWATER MANAGEMENT

- Stormwater Management Master Plans, Bylaws and Design Guidelines
  - recommend vegetative and pervious options to increase on-site retention
- Official Plans, Zoning Policies
  - reduction of paved surfaces
- Demonstration Projects



Source: Capital Regional District

# REDUCING ANTHROPOGENIC HEAT AND AIR POLLUTION

- Outreach and education campaigns
  - Rebate and incentive programs
  - Anti-idling bylaws
  - Corporate fleet management practices
  - Subsidies and zoning to encourage alternative/ 'clean' energy generation,
  - Corporate and community-based energy efficiency and greenhouse gas reduction plans and commitments
  - Public and private building standards and incentives for voluntary action
  - Active transportation infrastructure
- ... etc.



# URBAN FORM

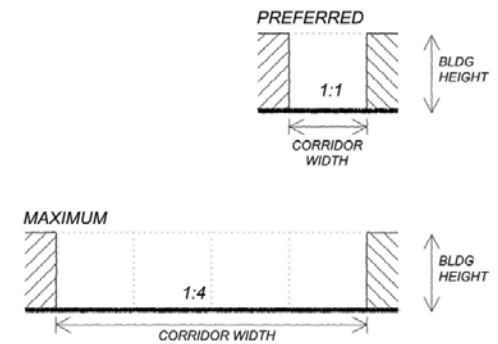
- Official Community, Secondary/Master Plans
  - parkland creation, preservation of 'open space'
  - street orientation, building height and massing
- Zoning Bylaws and Design Guidelines
  - parking requirements and design features



Source: City of Toronto



Victoria Park, London ON



Source: City of Waterloo

# Municipal Efforts – Survey Overview

- High albedo and high emissivity materials → Mainly through ‘green’ buildings; some voluntary incentives, mandatory in very few communities
- Trees and other vegetation → Multiple strategies in most communities; not always ‘strategic’
- Green infrastructure (green roofs, porous pavement) → Mainly through ‘green’ buildings, SWMMP and demonstrations; may become more common with on-site SWM emphasis
- Reducing anthropogenic heat and air pollution → Multiple strategies in most communities; focus on E eff and GHG/poll’n reduction
- Changes in urban form → Mainly through OCP and 2 Plans; parkland and open space are common, very few communities address urban canyons or sky view factors WRT UHIE

# Still need to address

- Retrofitting existing built environment to increase albedo and surface permeability
- Isolated programs and policies
- Site specific implementation strategies
- Increasing implementation of multiple measures and documenting impact

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