



TABLETOP DISCUSSION

The afternoon session culminated in a productive tabletop discussion. The discussion sought to gain input from the variety of attendees at the workshop to ascertain the current state of UHI activities in Canadian communities as well as future direction and requirements moving forward.

At each table, participants were asked to discuss their involvement with urban heat island mitigation activities. These three questions were used to guide the discussions:

- 1. What are the current activities participants employ to reduce urban heat island effect?**
- 2. What more needs to be done and who should do it?**
- 3. What Resources and Partnerships are needed moving forward?**

What are the current activities participants employ to reduce urban heat island effect?

A wide range of activities relating to mitigating the effects of extreme heat at the community level were being employed by Summit participants. Many of these activities related to public health and were initiated by public health practitioners, while other initiatives aimed at greening the built environment were being put in place by other municipal departments such as planning, NGOs and academia. Some of these activities are described below.

1. Public Health

- Public health practitioners are providing information on the health risks of extreme heat, air pollution and the health benefits of reducing the UHI in their community.
- Public health practitioners are taking an inter-departmental approach at the municipal level in dealing with the UHI. They are working with planners to introduce health information about urban heat island into regional planning.
- For example, Simcoe/Muskoka Health Unit is working on extreme heat and how this affects human health. This work is a good example of extreme heat as a concern not just in cities with urbanized heat islands, but also in smaller and rural communities.

2. Health Canada

- Health Canada is collaborating with researchers and decision-makers across the country and internationally to increase knowledge about how a changing climate can affect human health
- Health Canada's Climate Change and Health Office is implementing a three-pronged initiative on reducing the vulnerabilities of communities to extreme heat through four pilot communities. They are also working on mapping UHI vulnerability in Quebec. Their research will be captured

in a best practices guidebook on how to communities can reduce their vulnerability to extreme heat, which will include a component about mitigation the UHI effect. It is expected to be released in 2011.

3. Research / Academia

- In Universities, faculty are involved in urban climate research, which includes UHI work. Dr. Hashem Akbari in Concordia University continues his work on cool roofing and estimating the associated energy savings and emission reductions. Suzanne Briggs and Andrew Millward at Ryerson University have been examining the spatio-temporal distribution of Toronto's urban heat island while Mushtaq Hussain and Claus Rinner have been exploring the relationship between land use and surface temperature in the Greater Toronto Area.
- Natural Resources Canada's Earth Sciences Sector produced a detailed report on thermal remote sensing of urban heat islands with a focus on the Greater Toronto Area. This research examined the relationships between surface and air temperatures during heat events as well as an investigation of the spatial and temporal scales of urban heat fluxes and whether existing remote sensing platforms are appropriate for characterizing UHIs.
- Several participants identified that graduate students are examining the UHI as part of their Masters and PhD programs in Ontario universities
- The Canadian Institute for Health Information have prepared a report on how the physical environment affects health. UHI is very much a part of this.

4. ENGOS

- LEAF, a Toronto-based NGO has a shade tree planting and rebate program. This program is currently being piloted in Guelph, Cambridge, Kitchener and Waterloo, Ontario, with a view to expanding it to other communities if successful. For more information on this program, go to www.yourleaf.org/coolcommunities
- Clean Air Partnership has developed web-based software to help municipalities identify hotspots, those populations vulnerable to the UHI and to support the communications activities of municipalities in the GTA and Hamilton. Additionally, Clean Air Partnership has produced several papers on the UHI including 'Time to Tackle Toronto's Warming: Climate change adaptation options to deal with heat in Toronto', 'A Scan of Municipal Heat/Health Watch Warning Systems and Hot Weather Response Plans' and 'Protecting Canadians from Extreme Heat Events: Reducing the Urban Heat Island Effect in Canadian Communities'. For more information, please go to www.cleanairpartnership.org
- Clean Air Partnership has also developed a residential outreach program, C3Ontario 'Creating Cool Communities in Ontario'. C3Ontario is a pilot program to inform homeowners of simple ways to reduce heat in their homes and the urban heat island effect in their communities including cool roofing, strategic tree planting and use of cool pavements. For more information, please go to www.c3ontario.org

5. Cities / Municipalities

- Municipalities in Ontario are increasing the levels of preventive maintenance of infrastructure to cope with the increased temperature stresses on infrastructure due to climate change and UHI effects
- The City of Toronto has approved the Toronto Green Roof Bylaw requiring that a portion of roof space be given over to green roofing for all roofs over 2000m² in size, for more information on this bylaw, go to http://www.toronto.ca/legdocs/municode/1184_492.pdf. Additionally, the City of Toronto has created the Toronto Eco-Roof Incentive Program, designed to promote the use of green and cool roofs on Toronto's commercial, industrial and institutional buildings, and to help Toronto's business community take action on climate change. more information on this program is available at http://www.toronto.ca/livegreen/greenbusiness_greenroofs_eco-roof.htm
- Municipalities are also working to develop best practices for communities regarding strategies to reduce their UHI effect and implement cool island strategies

6. Industry

- Envirobond Products Corp. is manufacturing an innovative crushed stone paving product called EnviroPAVE, this product has a far higher albedo and a higher rate of emissivity when compared to traditional pavement products, and costs less also. For more information on EnviroPAVE, go to <http://www.envirobond.com/products/enviopave>
- Interlock Roofing are offering a range of cool roof products available to residential customers in a range of colours and styles. These cool roofs are constructed from aluminum, but are designed to mirror the look of a conventional roof. For more information, go to <http://www.interlockroofing.com/>

What more needs to be done and who should do it?

In discussing what more needs to be done, participants identified a number elements and recommendations were mainly in the areas of collaboration and dialogue, awareness building, filling research gaps, evaluation and other sector-specific recommendations described below;

1. Increased Collaboration and Dialogue

Generally, participants noted that some information-sharing does occur, but the need for increased collaboration and dialogue was an often repeated theme through the day. Participants identified the challenge of overcoming insufficient communication among levels of government, academia, industry and NGOs working on urban heat island issues. Specific recommendations included;

- It was recommended that various government departments across jurisdictions collaborate more closely. For example, public health authorities could liaise with planners and disseminate UHI information to other departments – such as transportation, parks and recreation and housing

- There is a need for increased dialogue with both the general public and industry on the part of governments. There is a need to disseminate accurate information about urban heat islands and its effects on health and infrastructure. The construction industry, developers, trade organizations and the general public to be more engaged in this area
- Many participants also spoke to the importance and necessity for greater data sharing especially with respect to health data.

2. Awareness Building

Another topic that was raised many times by participants throughout the day related to awareness building. Generally, there is not enough general awareness of the urban heat island and how it can affect communities. There is a need for greater awareness across many sectors. Key points from this discussion include;

- Participants agreed building greater awareness among their respective fields and professions is essential and that more work is necessary here
- Participants talked about the importance of education and raising awareness in the general public, vulnerable populations and policy decision-makers about its impact on the individual's and community's health, well-being and safety
- There is a need to build awareness about the value and availability of UHI mitigation technologies, such as residential cool roofing and about contractors who can install cool roofs and other UHI mitigation measures
- Promoting the value of green spaces and trees from a real estate perspective was noted as a mechanism that would indirectly build greater UHI countermeasures

3. Research Gaps

Participants identified there are several research gaps and data shortages that need to be addressed. Furthermore, this research must be able to tailor its findings to the relevant audience, and provide decision makers with the information they need to mitigate urban heat.

- In particular, there is a need to develop a business case for the real estate and development community
- Research results need to produce quality data and "numbers" to develop persuasive arguments about the impacts of UHI effect on our health and community infrastructure and the co-benefits of urban heat island mitigation
- There is a need to conduct further research on the built form in order to better understand options and opportunities to (re) design our urban cores, such as the optimal spacing of buildings

4. Evaluation

To develop an effective business case for action to be taken to reduce the urban heat island, participants identified the importance of undertaking a greater amount of product and program evaluations. Key points raised regarding evaluations include;

- Many participants noted the need for more demonstration projects that showcase the impact of the reduction of the UHI and other co-benefits
- There is a demand for demonstration projects that quantitatively assess the impact of UHI reduction measures to test the claims associated with specific UHI reduction measures
- There is a need to have an urban scale monitoring program. This could be lead by universities or research organisations.

5. Sector-specific Recommendations

Participants also identified several sector-specific gaps and suggested actions to undertake in order to further support the implementation of UHI mitigation specific technologies and policies.

- In the construction industry, greater focus on cool roofs is needed. A certification program could be initiated for environmentally friendly roofing, such as a cool roofer certification program – this could be lead by the ENERQuality program
- There needs to be more research to ascertain the contribution of the transportation sector to urban heat island effect in Canada.
- It was recommended that ways to transform transportation corridors to reduce their impact on the UHI should be investigated. Not only to reduce the increasing car traffic, but also to green transportation corridors by planting trees; this would yield additional co-benefits.
- It was noted that the Ontario Planning Act (site plan control – section 41) could be used to influence UHI issues
- Urban sprawl is a significant environmental and also UHI concern. We need to proactively design approaches to maintain green space when developing suburban areas

What Resources and Partnerships are necessary for moving forward?

Participants suggested the most effective way to move forward on ‘mainstreaming’ UHI effect countermeasures was to increase collaboration across disciplines and sectors and also dedicate funding to develop showcase projects. The key points are:

- There is a need for more financial support from higher levels of government. For instance, the Quebec government is providing funding for the implementation of showcase projects in Montreal. Something similar would be of value in Ontario and to other provinces. Funding is

badly needed to support education projects for the general public that highlight the importance of mitigating against the UHI effect.

- Participants felt there was an increased need to collaborate with groups such as real estate developers, planners and the construction industry, including the Canadian Green Building Council and the Home Builders Association to promote the benefits of and strategies for UHI mitigation.
- The warehousing sector is an area in which there could be opportunities to educate about different building alternatives, such as cool pavements or roofing and to provide information on the benefit and cost effectiveness of greener technologies
- Funding is needed to support access to cheaper trees and landscaping products for homeowners
- Work on developing research partnerships between municipalities and NGOs with industry, university and high schools
- Funding is needed to allow researchers to develop a business case for UHI counter measures