

KEAF Suggested research project #1
Kingston's urban heat island amelioration

Background to Study

The City of Kingston is part of the Federation of Canadian Municipalities' "Partners in Climate Protection Program", a program designed to encourage municipalities to face the challenge of climate change. The next step in Kingston's commitment to the program is the formulation of a "Local Action Plan" to outline the City's actions to help both mitigate and adapt to climate warming.

The urban area of Kingston will have to deal with an increasing urban heat island effect and action is suggested to ameliorate this. A variety of measures to cool an urban area have been posited in the literature, for example, increasing the albedo through whiter roofs and roof top solar and to enhance cooling by transpiration by both green roofs and parks planted extensively with trees and shrubs.

Purpose of Study

The purpose of the study is to qualify and quantify the current urban environment that is contributing significantly to the existing heat island effect and to identify and quantify the required actions that would reduce significantly the effect even if those actions would not assist in mitigation.

KEAF Suggested research project #2
Greenhouse gas emissions resulting from 'drive-thru' facilities

Background to Study

The City of Kingston is part of the Federation of Canadian Municipalities' "Partners in Climate Protection Program", a program designed to encourage municipalities to face the challenge of climate change. The next step in Kingston's commitment to the program is the formulation of a "Local Action Plan" to outline the City's actions to help both mitigate and adapt to climate warming.

'Drive –thru' facilities for such items as coffee and fast-food are a part of everyday life in Kingston. 'Drive thru' facilities are always associated with vehicle engine idling and hence are assumed to contribute significant pollution and greenhouse gases to the environment.

Purpose of Study

The purpose of the study is to itemize the emissions associated with 'drive-thrus', quantify the extent of those emissions from selected 'drive-thrus' in the Kingston area and compare the results to a 'park and walk' system.

KEAF Suggested research project #3

The potential environmental, health and financial advantages of roundabouts over three-way stops, four-way stops and traffic lights.

Background to Study

The City of Kingston is part of the Federation of Canadian Municipalities' "Partners in Climate Protection Program", a program designed to encourage municipalities to face the challenge of climate change. The next step in Kingston's commitment to the program is the formulation of a "Local Action Plan" to outline the City's actions to help both mitigate and adapt to climate warming.

The City has some 160 traffic signals. There are approximately 60 all-way stop intersections, ~25 of which are 3-way stops and ~35 are 4-way-stops; there are over 2,000 intersections.

Purpose of Study

The purpose of the study is to quantify the benefits of roundabouts replacing 3- and 4-way stops and a selection of traffic lights to:

- reduce emissions and help with climate change mitigation;
- reduce accidents and their severity;
- produce financial benefits from the perspective of fewer traffic delays.

KEAF Suggested research project # 4

Building a thermal flashlight to be used in conjunction with a webcam to identify insulation needs in public buildings.

Background to Study

The City of Kingston is part of the Federation of Canadian Municipalities' "Partners in Climate Protection Program", a program designed to encourage municipalities to face the challenge of climate change. The next step in Kingston's commitment to the program is the formulation of a "Local Action Plan" to outline the City's actions to help both mitigate and adapt to climate warming. The Corporation has committed to reduce its own greenhouse gas (GHG) emissions by 20% by 2014 from the baseline year of 2000.

The heating and cooling of public buildings is a major contribution to GHG emissions by the Corporation. Determining where in a building structure heat loss or gain is excessive would make a significant contribution to where monies can be best spent on insulation. Thermal imaging cameras can assist to identify problem areas and typically cost over \$1,000, however, a thermal flashlight can be built for about \$40.

Purpose of the Study

The purpose of the study is to build a simple thermal flashlight and in conjunction with a webcam determine if they can be easily, effectively and reliably used to identify

insulation needs. In addition, the flashlight could be used to identify insulation needs in private buildings.

References

<http://publiclaboratory.org/tool/thermal-camera>

http://scripts.mit.edu/~eric_r/lowdoodle/

KEAF Suggested research project #5

Building a thermal flashlight to be used in conjunction with a webcam to assess the health of trees and other vegetation on City owned property

Background to Study

The City of Kingston has responsibility for the maintenance of all vegetation on City property and on those vegetated areas to ensure the safety of residents, the health of the vegetation and promote the aesthetics of the area. Thermal imaging cameras can assist to identify problem areas and typically cost over \$1,000, however, a thermal flashlight can be built for about \$40.

Purpose of the Study

The purpose of the study is to determine if a built thermal flashlight can be used in conjunction with a webcam to assist with the problem of vegetation maintenance on City owned property by both recording the current health of vegetation, particularly trees, and identifying problem areas.

References

<http://publiclaboratory.org/tool/thermal-camera>

http://scripts.mit.edu/~eric_r/lowdoodle/