AGENDA

ENVIRONMENTAL ADVISORY COMMITTEE

THE CORPORATION OF THE CITY OF MISSISSAUGA
www.mississauga.ca

TUESDAY, DECEMBER 11, 2012 – 9 A.M.

COUNCIL CHAMBER
SECOND FLOOR, CIVIC CENTRE
300 CITY CENTRE DRIVE, MISSISSAUGA, ONTARIO, L5B 3C1
www.mississauga.ca

Members

Councillor George Carlson, Ward 11 (CHAIR)
Michael DeWit, Citizen Member (VICE-CHAIR)
Councillor Jim Tovey, Ward 1
Councillor Frank Dale, Ward 4
Hassaan Basit, Citizen Member
Dr. Brad Bass, Citizen Member
Elaine Hanson, Sheridan College, Office for Sustainability
Lucas Krist, Peel Environmental Youth Alliance
Val Ohori, Citizen Member
Peter Orphanos, Citizen Member
Maureen Ricker, Citizen Member
Lucia Salvati, University of Toronto at Mississauga
Diana Yoon, Peel Environmental Youth Alliance

Agency Liaison

Lea Ann Mallett, EcoSource

CONTACT PERSON: Karen Morden, Legislative Coordinator
Office of the City Clerk, Telephone: 905-615-3200, ext. 5423; Fax 905-615-4181
karen.morden@mississauga.ca

CALL TO ORDER

APPROVAL OF AGENDA

DECLARATIONS OF DIRECT (OR INDIRECT) PECUNIARY INTEREST

PRESENTATIONS/DEPUTATIONS

(A) Significant Tree Program

Sarah Jane Miller, Forest Ecologist Assistant, will speak with respect to the Significant Tree Program.

(B) EcoBuzz

Lucas Krist, Peel Environmental Youth Alliance, will speak with respect to the 10th Annual EcoBuzz Conference.

(C) Expanding Natural Heritage Through Greening Hard Infrastructure

Dr. Brad Bass, Citizen Member, will speak with respect to methods of greening hard infrastructure.

MATTERS TO BE CONSIDERED

1. Approval of Minutes of Previous Meeting

Minutes of the meeting held November 6, 2012.

RECOMMEND APPROVAL

2. Council Resolution in Support of Rooftop Solar Applications Under the Provincial Feed-in Tariff (FIT) Program - Update

Memorandum, dated November 27, 2012, from Mary Bracken, Environmental Specialist, with respect to the Council resolution in support of rooftop solar applications under the Provincial Feed-in Tariff (FIT).

RECOMMEND RECEIPT

3. Environmental Advisory Committee November 24, 2012 Off-Site Meeting Summary

Memorandum, dated November 26, 2012, from Brenda Osborne, Director, Environment Division, with respect to the off-site meeting held on November 24, 2012.

RECOMMEND RECEIPT

4. Financing Energy Efficiency Through Local Improvement Charges and the Changes to the *Municipal Act, 2001*

Memorandum, dated November 23, 2012, from Julius Lindsay, Community Energy Specialist, with respect to financing energy efficiency through local improvement charges and the changes to the *Municipal Act, 2001.*

RECOMMEND RECEIPT

5. Upcoming Agenda Items and Environmental Advisory Committee (EAC) Role

Chart from Environment staff with respect to upcoming agenda items and Environmental Advisory Committee (EAC) role.

RECOMMEND RECEIPT

6. Enbridge Pipeline Flow Reversal Project

Mary Bracken, Environmental Specialist, will provide a verbal update with respect to the Enbridge Pipeline Flow Reversal Project.

7. Upcoming Agenda Items and Environmental Advisory Committee (EAC) Role

A chart by Lisa Urbani, Environmental Research Assistant, with respect to upcoming agenda items and Environmental Advisory Committee (EAC) role.

RECOMMEND RECEIPT

8. Status of Outstanding Issues from the Environmental Advisory Committee (EAC)

Chart dated November 6, 2012 from Karen Morden, Legislative Coordinator, Environmental Advisory Committee, with respect to the status of outstanding issues from the Environmental Advisory Committee (EAC).

RECOMMEND RECEIPT

INFORMATION ITEMS

(i) Toronto's Future Weather & Climate Driver Study: Outcomes Report

RECOMMEND RECEIPT

DATE OF NEXT MEETING – Tuesday, January 8, 2013 at 9 a.m., Council Chamber

OTHER BUSINESS

ADJOURNMENT

MINUTES

ENVIRONMENTAL ADVISORY COMMITTEE

THE CORPORATION OF THE CITY OF MISSISSAUGA

TUESDAY, NOVEMBER 6, 2012 – 9 A.M.

COUNCIL CHAMBER
SECOND FLOOR, CIVIC CENTRE
300 CITY CENTRE DRIVE, MISSISSAUGA, ONTARIO, L5B 3C1
www.mississauga.ca

MEMBERS/AGENCY LIAISONS PRESENT:	Councillor George Carlson, Ward 11 (CHAIR) Michael DeWit, Citizen Member (VICE-CHAIR) Councillor Jim Tovey, Ward 1 (departure at 11:00 a.m., Other Municipal Business) Councillor Frank Dale, Ward 4 Carolyn Bailey, EcoSource Dr. Brad Bass, Citizen Member Elaine Hanson, Sheridan College, Office for Sustainability Lucas Krist, Peel Environmental Youth Alliance Val Ohori, Citizen Member (departure at 11:00 a.m.) Peter Orphanos, Citizen Member (departure at 10:40 a.m.) Maureen Ricker, Citizen Member Lucia Salvati, University of Toronto at Mississauga Diana Yoon, Peel Environmental Youth Alliance
MEMBERS/AGENCY LIAISONS ABSENT:	Hassaan Basit, Citizen Member Elaine Hanson, Sheridan College, Office for Sustainability Lea Ann Mallett, EcoSource Rahul Mehta, EcoSource
STAFF/OTHERS PRESENT:	Muneef Ahmad, Water Resources Engineer Mary Bracken, Environmental Specialist Jayne Darragh, Planner Julius Lindsay, Environmental Specialist Andrea J. McLeod, Environmental Specialist Brenda Osborne, Director, Environment Division Olav Sibille, Planner Lisa Urbani, Environmental Research Assistant

Karen Morden, Legislative Coordinator
Office of the City Clerk, Telephone: 905-615-3200, ext. 5423; Fax 905-615-4181
karen.morden@mississauga.ca

CALL TO ORDER – 9:08 a.m.

At this time Brenda Osborne, Director, Environment Division, introduced Julius Lindsay, Environmental Specialist, and Faizan Sohail, student from the University of Toronto at Mississauga, to the Committee.

APPROVAL OF AGENDA - Approved (F. Dale)

DECLARATIONS OF DIRECT (OR INDIRECT) PECUNIARY INTEREST – Nil

PRESENTATIONS/DEPUTATIONS

A. Idle Free Program in Peel – DADA and Peel Region Collaboration

Steve Rieck and Mike Jones from Dads Against Dirty Air (DADA) spoke with respect to the Idle Free Program in Peel. Mr. Rieck provided background on DADA noting that it is a non-profit organization, that they provide resources to citizens, provides an idle-free campaign to schools to be utilized by the teachers and students among other initiatives.

Several recommendations from DADA were put forth to the Environmental Advisory Committee including strengthening the By-law to shorten the time limit of idling to one minute, refreshing By-law Enforcement Officer training, a request of staff to investigate the feasibility of shortening the idling "stopover" time, to develop a proactive enforcement and education blitz focused on schools during drop-off and pick-up times for a five day period, three times per year, to create a mandated regular duty for Enforcement Officers to check schools for infractions during the daily drop-off and pick-up times, create a public awareness campaign, and a request that the City of Mississauga write to the Province of Ontario requesting a Provincial Idling Offence.

Andrea McLeod, Environment Division, expressed that there are potential opportunities to work together and will speak further with the members of DADA to ascertain outreach connections. Ms. McLeod also mentioned that the Enforcement Division would be attending a future Environmental Advisory Committee (EAC) meeting as they are currently updating the anti-idling by-law. In addition Ms. McLeod noted that Enforcement staff have been trained by the Community Environment Alliance.

Recommendation
EAC-0053-2012

1. That the PowerPoint presentation entitled "DADA: Dads Against Dirty Air" by Steve Rieck and Mike Jones, Chair of DADA, a registered charity in Peel, to the Environmental Advisory Committee on November 6, 2012 be received; and
2. That the Environmental Advisory Committee requests that the recommendations made by the DADA representatives be referred back to staff for follow up.

Received (J. Tovey)

B. Natural Heritage and Urban Forest Strategy

Olav Sibille, Planner, and Mirek Sharp, Consultant from North-South Environmental, spoke with respect to the Natural Heritage and Urban Forest Strategy.

Mr. Sibille provided background information with respect to the Natural Heritage and Urban Forest Strategy and noted that the project consultants started work on the project in May, 2012. At this time he also provided information with respect to the team, describing it as multi-disciplinary with a vast set of skills and expertise. Mr. Sibille also noted that the Project Team would be looking for input from the Environmental Advisory Committee.

Mr. Sibille provided an overview of the project, noting that the purpose of the study was to sustain protection, enhancement and restoration of Mississauga's natural heritage and urban forest. He mentioned that Phase 1 of the project commenced in Spring 2012 and would conclude in Fall of 2012. Mr. Sibille provided an overview of existing conditions in Mississauga's natural areas and urban forest and stressed that they key theme would be "Valuing Mississauga's natural areas and urban forest." He stated that the replacement value of the trees is $1.4 billion, but also noted the environmental benefits in preserving Mississauga's natural areas and urban forest.

It was noted that the key challenges to sustaining natural areas and the urban forest in Mississauga are a competition with infestation, infill, stressors related to climate change, pest and disease control and increasing recreational demands and pressures.

Dr. Brad Bass, Citizen Member, thanked the presenters for attending the meeting and made an inquiry with respect to the percentage of natural coverage. His question was explained by Mr. Sharp who noted that there is 7.1% natural coverage and that the 9.5% used in the study represented street trees as well.

Val Ohori, Citizen Member, noted that health and quality of life is what should be maintained, preserved and expanded upon, to which there was general consensus from the Committee.

Recommendation
EAC-0054-2012
That the PowerPoint presentation entitled "Natural Heritage and Urban Forest Strategy" by Olav Sibille, Planner and Mirek Sharp, Consultant from North-South Environmental, to the Environmental Advisory Committee on November 6, 2012 be received.

Received (J. Tovey)

C. Sustainable Neighbourhood Retrofit Action Plan

Muneef Ahmad, Water Resources Engineer, spoke with respect to the Sustainable Neighbourhood Retrofit Action Plan (SNAP).

Mr. Ahmad provided background information with respect to the SNAP program and

expressed the need to get residents involved and committed. The outreach process commenced in the Spring of 2012 with a cross-section of community leaders with respect to trails, public spaces community gardens, amongst others. Mr. Ahmad noted that the next steps would be social marketing, developing an action plan and to then implement pilot projects. The pilots will build on what they have already done and it was noted that the Region of Peel has worked with Parks and Forestry to build a Fusion Garden as part of Peel Water Smart Initiative at Fleetwood Park. It was noted at this time that schools will be a key engagement hub to reaching out to the community through talking with students, teachers and leadership for input. It was also noted that thus far, schools are eager to get involved.

Lucas Krist, Committee Member, inquired about funding for starting a garden or to buy a rain barrel. Ms. Osborne noted it was part of the Let Your Green Show, which is a part of the Let Your Green Show.ca campaign phase 1 and is also an ongoing Region of Peel program.

Councillor Tovey had several inquiries with respect to budget and funding, community partners and how neighbourhoods were selected to participate. It was noted that the SNAP program has a budget of $75,000. Councillor Tovey also mentioned a trade fair that is hosted in Ward 1 a few times per year and invited SNAP to attend.

Recommendation
EAC-0055-2012
That the PowerPoint presentation entitled "Sustainable Neighbourhood Retrofit Action Plan" by Muneef Ahmad, Water Resources Engineer, to the Environmental Advisory Committee on November 6, 2012 be received.

Received (B. Bass)

D. Living Green Master Plan

Mary Bracken, Environmental Specialist, provided an update with respect to the Living Green Master Plan (LGMP).

Ms. Bracken provided an update on the first nine months, noting many successful initiatives such as better transportation through transit, AutoShare, cycling and walking. It was noted that 25 km of bike and walking lanes had been installed in 2011 and that would increase in 2012. Ms. Bracken noted that transportation issues are a challenge and she is working with Transportation and Works and Planning collaboratively to address the issues. Ms. Bracken mentioned a positive partnership with Smart Commute, whose name will be changing to Sustained Mobility.

Ms. Bracken provided an overview of many successes in improving the environmental status in Mississauga such as the development of a flood and erosion plan, the Oakville Clarkson Zone Management Advisory Committee, rooftop solar panels at the Hershey Centre, positive outreach programs such as Let Your Green Show and SNAP, amongst many others. It was noted that Facilities and Operations has led by example, with projects including the installation of LED street lighting which will decrease energy

consumption by 50% and the ammonia waste recovery system at Hershey.

Dr. Brad Bass, Citizen Member, congratulated Ms. Bracken on a tremendous project and progress and urged the Environment Division to get the Members of the Environmental Advisory Committee involved.

Recommendation
EAC-0056-2012
That the PowerPoint presentation entitled "Living Green Master Plan" by Mary Bracken, Environmental Specialist, to the Environmental Advisory Committee on November 6, 2012 be received.

Received (B. Bass)

E. Tree Permit By-law

Jane Darragh, Planner, provided an update with respect to the results of the public consultation process and proposed amendments to the Tree Permit By-law.

Ms. Darragh provided an overview of recent public consultation meetings, noting that four meetings were held and four public information centres had been established. With respect to the public consultation Ms. Darragh mentioned that residents were most concerned with individual tree fees and did not want to move forward with that plan. There was stronger support for multiple tree fees and the process and practice will continue. Ms. Darragh provided financial information to the Committee with respect to the amendments to the By-law and noted that the amended By-law would be taken before General Committee on November 21, 2012 in hopes of having a new Tree Permit By-Law by March 2013.

Recommendation
EAC-0057-2012
That the PowerPoint Presentation entitled "Tree Permit By-law" by Jane Darragh, Planner, to the Environmental Advisory Committee on November 6, 2012 be received.

Received (M. DeWit)

MATTERS CONSIDERED

1. Approval of Minutes of Previous Meeting

Minutes of the meeting held October 2, 2012.

Approved (M. DeWit)

2. Background Circular – DADA (Dads Against Dirty Air

Received (during Deputation A)

3. Environmental Advisory Committee 2012 Off-Site Meeting Options

Memorandum dated October 19, 2012, from Brenda Osborne, Director, Environment Division, with respect to a proposed off-site meeting to establish potential projects that the Environmental Advisory Committee could take a lead role in developing.

Recommendation
EAC-0059-2012
1. That the Memorandum, dated October 19, 2012 from Brenda Osborne, Director, Environment Division, be received; and
2. That the matter of organizing a future off-site educational or training session for the Environmental Advisory Committee be circulated to Committee Members via email for their feedback; and
3. That a date, location and agenda would be established at that time.

4. Verbal Update from the Director, Environmental Division, Community Services

Brenda Osborne, Director, Environment Division, provided a verbal update with respect to the Let Your Green Show campaign. Ms. Osborne congratulated Ward 1 and Councillor Tovey for being the first recipients of the Greenest Ward Award, to be presented at the November 28, 2012 Council Meeting and encouraged all Committee Members to attend.

5. Upcoming Agenda Items and Environmental Advisory Committee (EAC) Role

Chart from Environment staff with respect to upcoming agenda items and Environmental Advisory Committee (EAC) role.

Recommendation
EAC-0060-2012
That the chart from Environment Staff with respect to upcoming agenda items and Environmental Advisory Committee role be received.

Received (M. Ricker)

6. Status of Outstanding Issues from the Environmental Advisory Committee (EAC)

Chart dated November 6, 2012 from Karen Morden, Legislative Coordinator, Environmental Advisory Committee, with respect to the status of outstanding issues from the Environmental Advisory Committee (EAC).

Recommendation
EAC-0061-2012
That the chart dated November 6, 2012 by Karen Morden, Legislative Coordinator, with respect to outstanding issues from the Environmental Advisory Committee, be received.

Received (B. Bass)

7. 2013 Environmental Advisory Committee Meeting Dates

Memorandum, dated October 22, 2012 from Karen Morden, Legislative Coordinator, with respect to the scheduled meeting dates for the Environmental Advisory Committee for the year 2013.

Recommendation
EAC-0062-2012
That the Memorandum, dated October 22, 2012 from Karen Morden, Legislative Coordinator, with respect to the scheduled meeting dates for the Environmental Advisory Committee for the year 2013, be received.

Received (F. Dale)

INFORMATION ITEMS – Nil

DATE OF NEXT MEETING – Tuesday, December 11, 2012 at 9 a.m., Council Chamber

OTHER BUSINESS – Nil

ADJOURNMENT – 11:21 a.m. (L. Krist)

Memorandum

TO:	Environmental Advisory Committee Meeting Date: December 11, 2012
FROM:	Mary Bracken, Environmental Specialist, Environment Division, Community Services Department
DATE:	November 27, 2012
SUBJECT:	**Council Resolution in Support of Rooftop Solar Applications Under the Provincial Feed-in Tariff (FIT) Program - Update**

General Committee of Council will consider a report on December 5, 2012 regarding a new revised Council support resolution for rooftop solar applications under the Provincial Feed-in Tariff (FIT) Program. Attached, please find a copy of the Corporate Report to General Committee (Attachment 1).

Council has already passed two blanket resolutions in support of rooftop solar applications under the FIT Program: one on July 4, 2012 and the other on September 26, 2012.

The July 4, 2012 resolution was based on the draft FIT 2.0 information. The resolution stated "supports, in principle," subject to conditions relating to fire safety and glare. This resolution did not meet the requirements for priority points under the final FIT 2.0 rules.

The September 26, 2012 resolution was passed according to the required wording for priority points in the FIT 2.0 Program and included the words "supports without reservation". Council had concerns with the wording of the resolution and with potential impacts of rooftop solar installations on neighbouring residential areas. However, the application window for the FIT Program was scheduled to open on October 1, 2012 and, to avoid jeopardizing applicants applying to the FIT Program, Council passed the resolution, but stipulated it would lapse in three months. As such, the September 26, 2012 resolution will expire on December 26, 2012. Subsequently, on September 28, 2012 the Ontario Power Authority (OPA) announced that the application window is delayed and, to date, no announcement has been made with respect to when the application window for the FIT Program will open.

Many municipalities, including Mississauga, had expressed concerns to the OPA with respect to the wording requirements for the support resolution. In response, on November 12, 2012, the OPA revised the requirements for municipal support resolutions to exclude the words "without reservation". Therefore, the proposed wording of the new revised Council support resolution states that "The Council of the City of Mississauga supports the construction and operation of Rooftop Solar Projects anywhere in the City of Mississauga, including but not limited to Rooftop Solar Projects on City-owned buildings."

In addition, in order to address concerns raised by Council regarding potential impacts of rooftop solar projects on adjacent residential areas, a checklist has been developed which applicants seeking

the Council support resolution must satisfy prior to receiving an official copy of the resolution. The checklist (see Appendix 5 of Attachment 1) addresses issues relating to visibility, noise, glare, ice, safety and emergencies.

Council will consider the motion to pass the new revised resolution at the December 12, 2012 Council meeting. Once Council passes the motion, staff will be in a position to issue the resolution to applicants who satisfy the items on the checklist.

MPBrack

Mary Bracken
Environmental Specialist
Environment Division
Community Services Department

Attachment 1: November 21, 2012 General Committee Corporate Report titled "New Revised Council Resolution in Support of Rooftop Solar Applications Under the Provincial Feed-in Tariff (FIT) Program"

Corporate Report

Clerk's Files

Originator's Files

DATE: November 21, 2012

TO: Chair and Members of General Committee
Meeting Date: December 5, 2012

General Committee
DEC 0 5 2012

FROM: Paul A. Mitcham, P.Eng., MBA
Commissioner of Community Services

SUBJECT: **New Revised Council Resolution in Support of Rooftop Solar Applications Under the Provincial Feed-in Tariff (FIT) Program**

RECOMMENDATION:

1. That Council pass a resolution supporting rooftop solar projects in Mississauga as outlined in the Corporate Report titled "New Revised Council Resolution in Support of Rooftop Solar Applications Under the Provincial Feed-in Tariff (FIT) Program" dated November 21, 2012 from the Commissioner of Community Services.

2. That a resolution repealing Resolutions 0170-2012 and 0219-2012 be passed by Council.

REPORT HIGHLIGHTS:

- On August 10, 2012, the Province of Ontario released the new Feed-in Tariff (FIT) 2.0 Program, which included the requirements for municipal council support resolutions to qualify applicants of the FIT 2.0 Program for priority points.
- On November 12, 2012, the Ontario Power Authority (OPA) revised the requirements for the wording of the municipal support resolutions.
- Council passed two support resolutions for rooftop solar applications: the first on July 4, 2012 supporting, in principle,

rooftop solar applications under the FIT Program subject to three conditions; and the second on September 26, 2012 supporting, without reservation, rooftop solar applications with no conditions.

- The July 4, 2012 resolution does not meet the OPA's current requirements for priority points and the September 26, 2012 resolution expires December 26, 2012.
- In order for applications to the FIT 2.0 Program to qualify for priority points based on municipal council support, Council must pass the new resolution.
- The new revised Council support resolution will be provided to applicants who fulfill the criteria contained in a checklist.

BACKGROUND:

On July 4, 2012, Mississauga Council passed Resolution 0170-2012 to support, in principle, solar rooftop projects in Mississauga subject to conditions relating to glare and fire safety. The resolution was based on the requirements of the draft Feed-in Tariff (FIT) 2.0 Program, and passed in anticipation of the new Feed-in Tariff (FIT) 2.0 Program being released and the application window being opened.

On August 10, 2012, the Ontario Power Authority (OPA) released the new FIT 2.0 Program which clarified the requirements for municipal council support resolutions to qualify applicants of the FIT 2.0 Program for priority points. The requirements specified:

a) wording for the municipal council support resolutions that included "support, without reservation"; and

b) that resolutions cannot be subject to conditions.

As such, the July 4, 2012 Council resolution did not meet the OPA's requirements for priority points. On September 26, 2012, Council considered a motion for a revised resolution with no conditions and with wording prescribed by the OPA including the words "support, without reservation". Concerns were raised regarding the prescribed wording, as well as potential impacts of rooftop solar projects on adjacent residential areas. The August 29, 2012 Corporate Report to General Committee is contained in Appendix 1.

Although Council had reservations about the wording of the resolution, to avoid jeopardizing applicants applying to the FIT Program for rooftop solar projects in Mississauga, the resolution was passed, but it was stipulated that it would lapse three months after adoption by Council. At the time of the September 26, 2012 Council meeting, the OPA had announced an October 1, 2012 opening of the FIT Program application window for small renewable energy projects (>10 kilowatt (kW) ≤ 500 kW). Subsequently, on September 28, 2012 the OPA announced that the application window would be delayed until further notice. At the time of writing this report, no new dates with respect to the application window have been announced.

Several municipalities, including Mississauga, have repeatedly expressed concern to the OPA about the wording requirements for the municipal support resolutions. In response, on November 12, 2012, the OPA revised the required wording to exclude the words "without reservation".

PRESENT STATUS: Resolution 0170-2012 adopted by Council on July 4, 2012 does not meet the OPA's requirements for municipal support resolutions qualifying for priority points. In addition, Resolution 0219-2012 adopted by Council on September 26, 2012 expires on December 26, 2012.

Presently, staff are aware of 21 companies who are preparing to apply for 184 rooftop solar installations in Mississauga. The applications are for small FIT projects (>10 kilowatt (kW) ≤ 500 kW). Of the 184 locations:

- 113 are Peel District School Board sites;
- Seven are City of Mississauga facilities;
- Two are GO parking garages;
- One is a hospital;
- One is a Region of Peel Social Housing project;

- One is an apartment building;
- One is a place of worship; and
- 58 are industrial or commercial buildings.

Appendix 2 is a map showing the locations of the proposed rooftop solar projects in Mississauga applying to the FIT Program. Appendix 3 contains 11 maps showing the same locations by individual ward.

COMMENTS:

Seeing as the July 4, 2012 resolution does not comply with the OPA's requirements and the September 26, 2012 resolution expires on December 26, 2012, Council must pass a new resolution in order to provide support for rooftop solar applications applying to the FIT Program. The new revised resolution, as proposed in Appendix 4, states that Council supports rooftop solar projects. The words "without reservation" have been removed.

In addition, in order to address Council's concerns regarding potential impacts of rooftop solar projects adjacent to residents, a checklist has been developed (see Appendix 5). The checklist addresses issues relating to visibility, noise, glare, ice, safety and emergencies. The Council support resolution will only be provided to applicants who satisfy the items on the checklist. Keeping in mind that renewable energy projects are exempt from planning approvals, but are required to obtain a building permit, the checklist covers aspects that would not be addressed through the building permit process. If an applicant cannot satisfy the items on the checklist, the Council support resolution will not be provided.

FINANCIAL IMPACT:

There are no financial impacts of the new revised blanket Council resolution in support of rooftop solar installations in Mississauga.

Where the rooftop solar installation is on a City-owned building, there will be revenue generated from the lease. The amount generated for each building will vary depending on the type and size of the installation.

CONCLUSION:

Passing the new revised resolution shows Council's support of rooftop solar projects in Mississauga, while ensuring impacts on residents will be addressed. It is unlikely that this new revised resolution will undermine any of the consents or permits that are required by the City or any other authority as the wording of the prescribed resolution provides that the sole purpose of the resolution is to enable FIT applicants to gain priority points and is not to be used for any other purpose.

The new revised Council support resolution will increase FIT 2.0 Program applicants' chances of being awarded the opportunity to build rooftop solar projects in Mississauga by enabling such applicants to qualify for priority points.

ATTACHMENTS:

Appendix 1: August 29, 2012 General Committee Corporate Report titled "Revised Council Resolution in Support of Rooftop Solar Applications Under the Provincial Feed-in Tariff (FIT) Program".
Appendix 2: Mississauga Locations of Rooftop Solar Projects Applying to the Feed-in Tariff Program.
Appendix 3: Locations of Rooftop Solar Projects Applying to the Feed-in Tariff Program by Ward.
Appendix 4: New Revised Council Support Resolution for Rooftop Solar Applications Under the Provincial Feed-in Tariff (FIT) 2.0 Program.
Appendix 5: Mississauga Rooftop Solar Applications Checklist.

Paul A. Mitcham, P.Eng., MBA
Commissioner of Community Services

Prepared By: Mary Bracken, Environmental Specialist

3(e)

Appendix 1

Corporate Report

Clerk's Files

Originator's Files

5.

DATE: August 29, 2012

TO: Chair and Members of General Committee
Meeting Date: September 19, 2012

General Committee
SEP 19 2012

FROM: Paul A. Mitcham, P.Eng., MBA
Commissioner of Community Services

SUBJECT: **Revised Council Resolution in Support of Rooftop Solar Applications Under the Provincial Feed-in Tariff (FIT) Program**

RECOMMENDATION: That Council pass a resolution supporting, without reservation, rooftop solar projects in Mississauga as outlined in the Corporate Report titled "Revised Council Resolution in Support of Rooftop Solar Applications Under the Provincial Feed-in Tariff (FIT) Program" dated August 29, 2012 from the Commissioner of Community Services and that a resolution repealing Resolution 0170-2012 be passed by Council.

REPORT HIGHLIGHTS:

- Based on the requirements of the draft Feed-in Tariff (FIT) 2.0 Program, on July 4, 2012 Council passed Resolution 0170-2012 supporting, in principle, rooftop solar applications under the FIT Program subject to certain conditions.
- On August 10, 2012, the Province of Ontario released the new Feed-in Tariff (FIT) 2.0 Program, which clarified the requirements for municipal council support resolutions to qualify applicants of the FIT 2.0 Program for priority points.
- The wording in the July 4, 2012 Council resolution does not meet the new FIT 2.0 Program requirements to enable applicants to qualify for priority points.

3(f)

- A revised blanket Council resolution, which excludes the conditions listed in the July 4, 2012 Council resolution, is proposed for the purpose of enabling applicants to qualify for priority points.
- In order for applicants to the FIT 2.0 Program to qualify for priority points based on municipal council support, Council must pass the revised resolution in its prescribed form.
- The application window for small FIT projects (>10 kilowatt (kW) ≤ 500 kW) is anticipated to open October 1, 2012 and remain open until November 30, 2012.

BACKGROUND:

On July 4, 2012, Mississauga Council passed Resolution 0170-2012 to support, in principle, solar rooftop projects in Mississauga. The resolution was based on the requirements of the draft Feed-in Tariff (FIT) 2.0 Program and passed in anticipation of the new Feed-in Tariff (FIT) Program being released. The June 14, 2012 Corporate Report to General Committee is contained in Appendix 1.

On August 10, 2012, the Ontario Power Authority (OPA) released the new FIT 2.0 Program which clarified the requirements for municipal council support resolutions to qualify applicants of the FIT 2.0 Program for priority points. The application window for small FIT projects (>10 kW ≤ 500 kW) is anticipated to extend from October 1, 2012 to November 30, 2012. All applications received during the application window will be reviewed according to the new FIT 2.0 Program Rules for compliance and for the prioritization of applications. Where projects have the same number of priority points, the time stamp will be used to determine the order in which projects will be tested for available transmission and distribution capacity. The OPA anticipates awarding 200 megawatts of small FIT contracts.

The new FIT 2.0 rules stipulate that, in the application for the FIT Program, priority points will be awarded for certain factors. Two of the priority points will be given for a municipal council support resolution. A prescribed form/template for a municipal council blanket support resolution is provided under the FIT 2.0 Program. The wording in the template stipulates that a council support, without reservation, renewable energy projects. In addition, a confirming by-law demonstrating the support of the local municipality is required.

PRESENT STATUS:

There are two aspects of the July 4, 2012 Council resolution that do not comply with the new FIT 2.0 Program:

1. The words support "in principle" do not meet the intent of the OPA's prescribed forms which state support "without reservation"; and

2. The three conditions do not meet the intent of supporting "without reservation".

COMMENTS:

City staff has consulted with the OPA to ensure that the revised resolution (Appendix 2) will be acceptable for the priority points.

In order to enable applicants to the FIT 2.0 Program to qualify for the priority points tied to municipal council support, Council must pass a resolution in the form prescribed by the OPA. The following outlines the differences between the July 4, 2012 resolution and the proposed resolution:

1. Change the wording to: "The Council of the City of Mississauga supports without reservation the construction and operation of Rooftop Solar Projects", thereby removing the words "in principle" and adding the words "without reservation".

2. Remove the three conditions relating to anti-reflective surfaces, fire safety and all applicable laws and regulations. Although the conditions would be removed, staff would ensure that, when providing copies of the Council resolution to applicants, information would be provided notifying applicants of these issues.

The requirement for a confirming by-law can be met with the confirmatory by-law which is passed after each Council meeting.

Passing the new resolution in its prescribed form shows Council's support of rooftop solar projects in Mississauga without reservations or conditions. It is unlikely that this new resolution will undermine any of the consents or permits that are required by the City or any other authority as the wording of the prescribed resolution provides

that the sole purpose of the resolution is to enable FIT applicants to gain priority points and that the resolution is not to be used for any other purpose.

FINANCIAL IMPACT: There are no financial impacts of the revised blanket Council resolution in support of rooftop solar installations.

Where the rooftop solar installation is on a City-owned building, there will be revenue generated from the lease. The amount generated for each building will vary depending on the type and size of the installation.

CONCLUSION: The revised Council support resolution will increase FIT 2.0 Program applicants' chances of being awarded the opportunity to build rooftop solar projects in Mississauga by enabling such applicants to qualify for priority points.

ATTACHMENTS:

Appendix 1: June 14, 2012 General Committee Corporate Report titled "Council Resolution in Support of Rooftop Solar Applications Under the Provincial Feed-in Tariff (FIT) Program".

Appendix 2: Revised Council Support Resolution for Rooftop Solar Applications Under the Provincial Feed-in Tariff (FIT) 2.0 Program.

J.A. McDougall per

Paul A. Mitcham, P.Eng., MBA
Commissioner of Community Services

Prepared By: Mary Bracken, Environmental Specialist

3(i)

Appendix 1

Corporate Report

Clerk's Files

Originator's Files

DATE:	June 14, 2012
TO:	Chair and Members of General Committee Meeting Date: June 27, 2012
FROM:	Paul A. Mitcham, P.Eng., MBA Commissioner of Community Services
SUBJECT:	**Council Resolution in Support of Rooftop Solar Applications Under the Provincial Feed-in Tariff (FIT) Program**

General Committee
JUN 27 2012

RECOMMENDATION: That Council pass a motion which supports, in principle, rooftop solar projects in Mississauga as outlined in the Corporate Report titled "Council Resolution in Support of Rooftop Solar Applications Under the Provincial Feed-in Tariff (FIT) Program" dated June 14, 2012 from the Commissioner of Community Services.

REPORT HIGHLIGHTS:

- The Province of Ontario will be releasing a new Feed-in Tariff (FIT) program.
- The draft FIT 2.0 program provides municipalities the opportunity to show their support for renewable energy projects by issuing a council support resolution.
- Mississauga has received numerous requests for Council resolutions supporting rooftop solar projects.
- The City has entered into an agreement with a solar photovoltaic company where the City will lease the roof space at selected City facilities and the company installs, owns, and operates the rooftop solar systems. Applications will be submitted to the FIT program for installation of solar photovoltaic systems on selected City

buildings. A Council resolution will be required to qualify for two priority points under the FIT application process.

- *Planning Act* approvals do not apply to renewable energy projects.
- The *Building Code Act* applies to renewable energy projects.
- A blanket Council resolution is proposed that supports rooftop solar projects, in principle, subject to a number of issues being addressed, such as those relating to: glare, safe access during emergencies, and heritage buildings.
- Supporting renewable energy projects is consistent with goals in the Strategic Plan, Living Green Master Plan, Official Plan, Economic Development Strategy and the City's Corporate Energy Management Plan.

BACKGROUND: **Province of Ontario Renewable Energy Initiatives**

The *Green Energy Act* (the "Act") came into effect in 2009. The Act addresses energy efficiency, energy conservation and demand management, and the promotion of renewable energy technologies. Renewable energy sources include: wind, waterpower, biomass, biogas, landfill gas, solar photovoltaic, and geothermal. The Act removes *Planning Act* authority over renewable energy projects. The *Building Code Act* remains applicable law and, as such, building permits are required depending on the size of the project.

In 2009, the Ontario Power Authority (OPA) released a Feed-in Tariff (FIT) program which included two purchase agreement programs for renewable energy projects:

- FIT program – Applies to renewable energy projects over 10 kilowatts (kW);
- microFIT program – Projects 10 kW or less, focussed on homeowners and small businesses.

The purpose of the FIT program was to encourage renewable power generation through a guaranteed pricing structure for renewable electricity production. It included standardized program rules, prices

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and contracts for those interested in developing a qualifying renewable energy project.

This report focuses on the FIT program and does not discuss the details of the microFIT program.

In 2011, the Ontario Ministry of Energy undertook a review of the FIT program. The feedback received from municipalities included concern relating to the lack of municipal authority over renewable energy projects. In April 2012, a draft of the revised FIT program (FIT 2.0) was released for comment. At the time of writing this report, the final FIT 2.0 program had not been released, but is anticipated any time.

The draft FIT 2.0 program includes revised rules for applications and a revised FIT price schedule.

The 2009 FIT program pricing was designed to kick-start the development of a domestic renewable energy industry. Prices for solar rooftop projects ranged from 53.9 cents per kilowatt hour (¢/kWh) to 71.3 ¢/kWh, depending on the size of the project (higher prices for smaller projects). The present domestic renewable energy sector is now of sufficient size to drive economies of scale and lower prices. The draft FIT 2.0 price schedule proposes a 10% to 25% reduction for rooftop solar installations. Prices in the draft FIT 2.0 program price schedule range from 48.7 ¢/kWh to 54.9 ¢/kWh, depending on the size of the project. A 15% price reduction for wind generation is proposed and no price changes are proposed for biomass, biogas and landfill gas projects. The OPA intends to review the FIT price schedule annually or as necessary based on changes in market conditions.

The draft FIT 2.0 program also introduces a point system for evaluating renewable energy projects. Of these priority points, there is the opportunity to submit support from the municipality in the form of a council support resolution. In the context of Mississauga, for rooftop solar projects, there would be a total of seven priority points available, two of which are attributed to an applicant having a supporting municipal council resolution.

The draft FIT 2.0 process has a number of stages. Initially, when an applicant submits a FIT application to the OPA for a renewable energy project they need to provide information such as proof of leasing or ownership of the building rooftop and general details of the project. It is at this stage that the council support resolution is requested for submission as part of the FIT application. The application is then reviewed by the OPA and successful applicants are selected and contracts awarded. This allows the applicant to pursue financing and further details of the project. The applicant has 18 months to install the project. During this time, the applicant must submit a notice to proceed, which includes a financing plan, impact assessment, domestic content, etc. The applicant must apply to the municipality for a building permit and the building permit must be issued prior to installation of the project. During the review of the building permit application, the municipality ensures that the solar installation is safe and abides by the Building Code. Structural implications such as the roof's structural integrity, the additional loading from the solar panels and how they are fastened are some of the factors that are examined.

City of Mississauga Renewable Energy Projects

In 2007, the City installed a 25 kW solar photovoltaic generation plant on the roof of the Hershey Centre as a pilot program. Originally, the City entered into an agreement under the Renewable Energy Standard Offer Program, which was upgraded to a FIT agreement in 2010. The pilot installation has been successful and has generated revenue for the City.

In 2011, the City issued a Request for Proposal to qualified photovoltaic power generation developers for leasing rooftop space at selected City facilities. The City completed a procurement process and has entered into an agreement with a solar photovoltaic company where the City will lease the roof space and the company installs, owns, and operates the rooftop solar systems. Once the FIT 2.0 program is released and the window for applications is open for rooftop solar projects, the company will submit applications to the OPA. Although the installations will be on City-owned buildings, the solar photovoltaic company will still require a Council resolution to qualify for the two priority points under the FIT application process.

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Rooftop Solar Installations in Mississauga

There are many rooftop solar installations in the City of Mississauga. The majority are small installations on residential dwellings. Some are larger installations on industrial or institutional buildings. Building permits have been issued for rooftop solar installations that have a surface area greater than or equal to 5 square meters (53.8 square feet) or if it constitutes a material alteration to the building. To date, no issues have been noted relating to rooftop solar installations.

City of Mississauga Plans

The Living Green Master Plan recognizes the importance of Mississauga's energy future and directs Mississauga to: assess energy efficiency and renewable fuel strategies; and continue to identify, invest in and implement renewable energy actions identified in the City's Corporate Energy Management Plan.

The Economic Development Strategy: Building on Success highlights the City's positive position through its economic base and skilled workforce to capitalize on the opportunities that lie in the emergence of the green economy, and the increasing importance of the use and development of clean technologies and their implications for sustainable growth. These opportunities will advance the City's economic future, both in terms of environmental stewardship and in its support for the incubation and production of new green technologies and services.

In addition, the new Mississauga Official Plan, which has been adopted by City of Mississauga Council and Region of Peel Council, but which is currently under appeal, highlights Mississauga's support for renewable energy systems by:

- promoting renewable energy systems; and
- working jointly with other levels of government and agencies to investigate the need, feasibility, implications and suitable locations for renewable energy projects and to promote local clean energy generation, where appropriate.

Other Municipalities

The Municipality of Strathroy-Caradoc Council passed two Resolutions on May 7, 2012 supporting individual rooftop solar projects.

The City of Vaughan Committee of the Whole approved a Recommendation on June 5, 2012 that City of Vaughan Council:

- endorse a resolution to support individual solar rooftop projects making application under the FIT 2.0 program; and
- give staff the authority to provide applicants a copy of the resolutions where the application meets certain criteria.

This will involve staff reviewing each application and issuing individual resolutions. The criteria stipulate that the rooftop solar project be for industrial applications, public use buildings, or site plans with solar rooftop applications that have been approved by the City of Vaughan. At the time of writing this report, City of Vaughan Council had not considered the Recommendation.

The City of Brampton Committee of Council passed a Resolution on June 13, 2012 supporting eight rooftop solar photovoltaic projects that are subject to applications under the FIT program.

There are several other municipalities in Ontario that are considering council resolutions for applications under the FIT program, but, to-date, have not passed a resolution.

PRESENT STATUS: The City of Mississauga has received requests from three solar energy companies, involving approximately ten different locations, for Council to pass a resolution in support of their rooftop solar projects. It is anticipated that, once the Province's FIT 2.0 program is released and the application window is opened, the City will receive more requests for Council resolutions.

COMMENTS: Presently, all of the requests received for a City of Mississauga Council support resolution have been for rooftop solar installations.

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This is attributed to the fact that there are many large flat roofs in Mississauga, primarily in industrial areas, and there are no large tracks of land suitable for ground mounted solar farms. In addition, average wind speeds in Mississauga are relatively low and do not provide enough capacity to make wind generation profitable. This report therefore proposes that a Council support resolution for FIT applications only be applicable to rooftop solar projects.

The draft FIT 2.0 program provides municipalities the opportunity to provide a council support resolution for FIT applications. This gives municipalities the ability to let the OPA know whether they support the project.

City staff has consulted with all City departments, the Region of Peel, other municipalities, the Environmental Advisory Committee, the OPA, and the solar industry. Although certain structural requirements are addressed through the building permit application, there are two issues that are not covered under the Building Code and one issue that should be highlighted early in the project:

1. Glare: The types of rooftop solar applications under the FIT program generally use anti-reflective solar photovoltaic systems. However, Mississauga is in an area of influence for both Toronto Pearson International Airport and Billy Bishop Toronto City Airport. Glare from solar panels could pose a risk to airplanes taking off and landing. As such, it should be stipulated that anti-glare surfaces be used.

2. Fire safety: In an emergency situation, access to the roof may be necessary. During a fire, ventilation may be required and emergency services staff may need to create holes in the roof. Access on the roof may also be required with enough space for emergency services staff to move around. While accessing the roof, live electricity may pose a risk. A main cut-off or breaker, that is readily accessible to emergency services, will assist in reducing risk during an emergency situation. However, the solar system may be live as long as the solar panels are producing electricity. Emergency services staff are trained to take appropriate measures around live solar panels. However, there

should be signage at the main breaker advising that the solar panels may still be live even if the breaker is off.

3. Heritage buildings:- The types of rooftop solar applications received under the FIT program are generally on large buildings with flat roofs. Therefore, it is anticipated that few, if any, applications under the FIT program would be proposed on heritage buildings. However, should a situation arise where a rooftop solar installation is proposed on a heritage building, the applicant should be advised that the *Ontario Heritage Act* applies and therefore a permit is required for the alteration of the building prior to the building permit being issued.

There are two types of council resolutions proposed under the draft FIT 2.0 rules:

- a blanket support resolution which would cover all applications; and

- a project-specific support resolution.

In order to issue project-specific Council support resolutions, each application will have to be reviewed in advance of the building permit application. In order to review each application, criteria and a process for review would have to be established. This will have resource implications. Other than the factors noted above (glare, fire), the building permit process will ensure safety requirements are met and other applicable laws such as the *Ontario Heritage Act* are addressed. There have been several large rooftop solar projects installed in Mississauga and no issues have been noted to date. However, endorsing the proponent of a specific project could present some liability issues for the City should there be issues with the installation.

A blanket resolution supporting rooftop solar installations provides the opportunity for the City to provide support, in principle, for renewable energy production, while highlighting to the applicant and the OPA specific criteria that is important to Mississauga, but not covered as part of the building permit process. The proposed blanket Resolution, contained in Appendix 1, provides support for rooftop solar projects

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subject to the glare and fire issues being addressed and highlights the need to obtain a heritage permit, if required. These criteria have been vetted by all City departments to ensure that rooftop solar applications under the FIT program will be compatible in Mississauga.

STRATEGIC PLAN:

The Strategic Plan stipulates that renewable energy is important to ensure Mississauga's sustainability. Action 1 of the Green Pillar states that Mississauga "will pursue renewable energy production and use to reduce green house gas emissions, improve air quality and protect natural resources."

Support of renewable energy projects, specifically rooftop solar installations, helps to achieve the goals of the Strategic Plan.

FINANCIAL IMPACT:

There are no financial impacts of a blanket Council resolution in support of rooftop solar installations.

Where the rooftop solar installation is on a City-owned building, there will be revenue generated from the lease. The amount generated for each building will vary depending on the type and size of the installation.

CONCLUSION:

Council support of rooftop solar renewable energy projects supports the directions in the Strategic Plan, the Living Green Master Plan, the Economic Development Strategy and the Official Plan, and will clearly demonstrate the desire for Mississauga to be recognized for its innovation and leadership in an emerging and green economy.

Although the 2009 *Green Energy Act* removed *Planning Act* approvals from renewable energy projects, the draft FIT 2.0 program provides municipalities the opportunity to state whether they support renewable energy projects through council resolutions. Mississauga has received requests for Council resolutions only for rooftop solar installations. By providing a Council resolution supporting rooftop solar projects, in principle, Mississauga has the opportunity to show support for rooftop solar projects while highlighting factors that are not covered under the building permit process relating to glare, fire and heritage buildings.

ATTACHMENTS: Appendix 1: Proposed Motion for City of Mississauga Council Blanket Support Resolution

Paul A. Mitcham, P.Eng., MBA
Commissioner of Community Services

Prepared By: Mary Bracken, Environmental Specialist

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Appendix 1

Proposed Motion for
CITY OF MISSISSAUGA COUNCIL SUPPORT RESOLUTION
FOR ROOFTOP SOLAR GENERATION PROJECTS

RESOLUTION NO.: _____ DATE: _____

WHEREAS the Province's Feed-in Tariff (FIT) program encourages the construction and operation of rooftop solar generation projects ("Rooftop Solar Projects");

AND WHEREAS it is likely that one or more Rooftop Solar Projects will be considered for construction and operation in the City of Mississauga;

AND WHEREAS, pursuant to the rules governing the FIT program (the "FIT Rules"), applicants whose Rooftop Solar Projects receive the support of municipalities will be awarded priority points, which may result in these applicants being offered a FIT contract by the Province prior to other persons applying for FIT contracts;

AND WHEREAS the *Green Energy Act, 2009,* S.O. 2009, c.12, as amended, stipulates that a municipal Official Plan and Zoning By-law does not apply to a renewable energy undertaking;

AND WHEREAS the *Building Code Act, 1992,* S.O. 1992, c.23, as amended, applies to renewable energy projects and, as such, each Rooftop Solar Project will require a building permit issued by the City of Mississauga Building Division;

AND WHEREAS, pursuant to the *Ontario Heritage Act*, R.S.O. 1990, c.0.18, as amended, each Rooftop Solar Project that is proposed to be located on a property listed on the City of Mississauga's Heritage Register or designated as a heritage property will require a Heritage Permit from the City of Mississauga prior to work commencing on such properties;

NOW THEREFORE BE IT RESOLVED THAT:

The Council of the City of Mississauga supports, in principle, the construction and operation of Rooftop Solar Projects in the City of Mississauga, including but not limited to Rooftop Solar Projects on City-owned buildings, subject to the following:

1. That all solar panels have an anti-reflective surface;
2. That fire safety issues be addressed to the satisfaction of the City of Mississauga's Fire and Emergency Services division with respect to emergency situations; and
3. That each Rooftop Solar Project shall have complied with all applicable laws and regulations, including but not limited to applicable City of Mississauga policies and procedures.

And further, that this Resolution's sole purpose is to enable the participants in the FIT program to receive priority points under the FIT program, and that this Resolution may not be used for the

purpose of any other form of municipal approval in relation to a FIT application or a Rooftop Solar Project or any other FIT project or for any other purpose.

And further, that Council support in principle shall lapse twelve (12) months after its adoption by Council.

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Appendix 2

Revised Motion for
CITY OF MISSISSAUGA COUNCIL SUPPORT RESOLUTION
FOR ROOFTOP SOLAR GENERATION PROJECTS

RESOLUTION NO.:_____ DATE: _____

WHEREAS the Province's Feed-in Tariff (FIT) Program encourages the construction and operation of rooftop solar generation projects ("Rooftop Solar Projects");

AND WHEREAS it is likely that one or more Rooftop Solar Projects will be considered for construction and operation in the City of Mississauga;

AND WHEREAS, pursuant to the rules governing the FIT Program (the "FIT Rules"), applicants whose Rooftop Solar Projects receive the formal support of local municipalities will be awarded priority points, which may result in these applicants being offered a FIT contract by the Province prior to other persons applying for FIT contracts;

AND WHEREAS the *Green Energy Act, 2009,* S.O. 2009, c.12, as amended, stipulates that a municipal Official Plan and Zoning By-law does not apply to a renewable energy undertaking;

AND WHEREAS the *Building Code Act, 1992,* S.O. 1992, c.23, as amended, applies to renewable energy projects and, as such, each Rooftop Solar Project will require a building permit issued by the City of Mississauga Planning and Building Department;

AND WHEREAS, pursuant to the *Ontario Heritage Act,* R.S.O. 1990, c.0.18, as amended, each Rooftop Solar Project that is proposed to be located on a property listed on the City of Mississauga's Heritage Register or designated as a heritage property will require a Heritage Permit from the City of Mississauga prior to work commencing on such properties;

NOW THEREFORE BE IT RESOLVED THAT:

The Council of the City of Mississauga supports without reservation the construction and operation of Rooftop Solar Projects anywhere in the City of Mississauga, including but not limited to Rooftop Solar Projects on City-owned buildings.

And further, that this Resolution's sole purpose is to enable the participants in the FIT Program to receive priority points under the FIT Program, and that this Resolution may not be used for the purpose of any other form of municipal approval in relation to a FIT application or a Rooftop Solar Project or for any other purpose.

And further, that Council support shall lapse twelve (12) months after its adoption by Council.

_____

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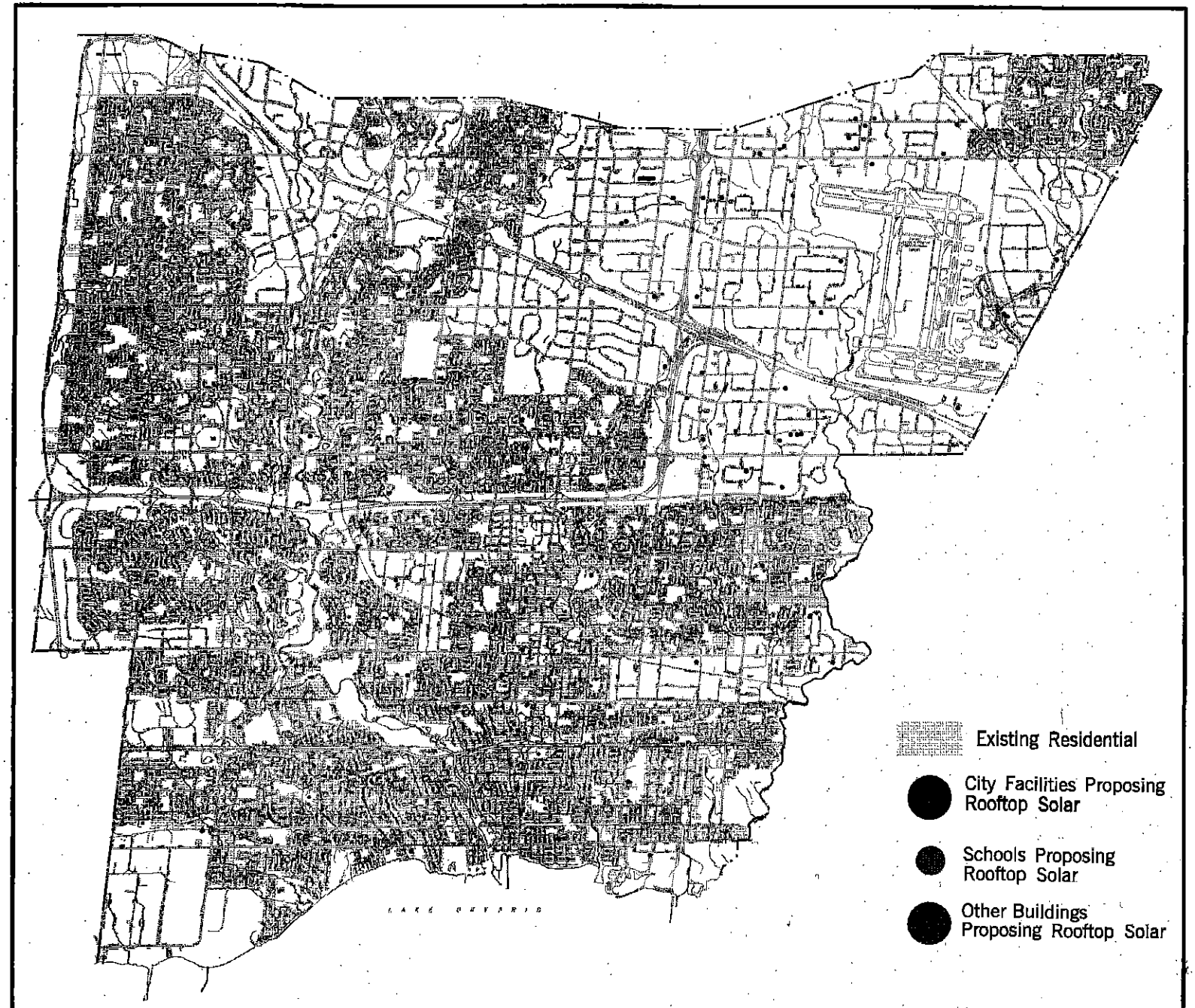

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APPLYING TO THE ONTARIO POWER AUTHORITY FEED-IN TARIFF PROGRAM

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APPENDIX 2

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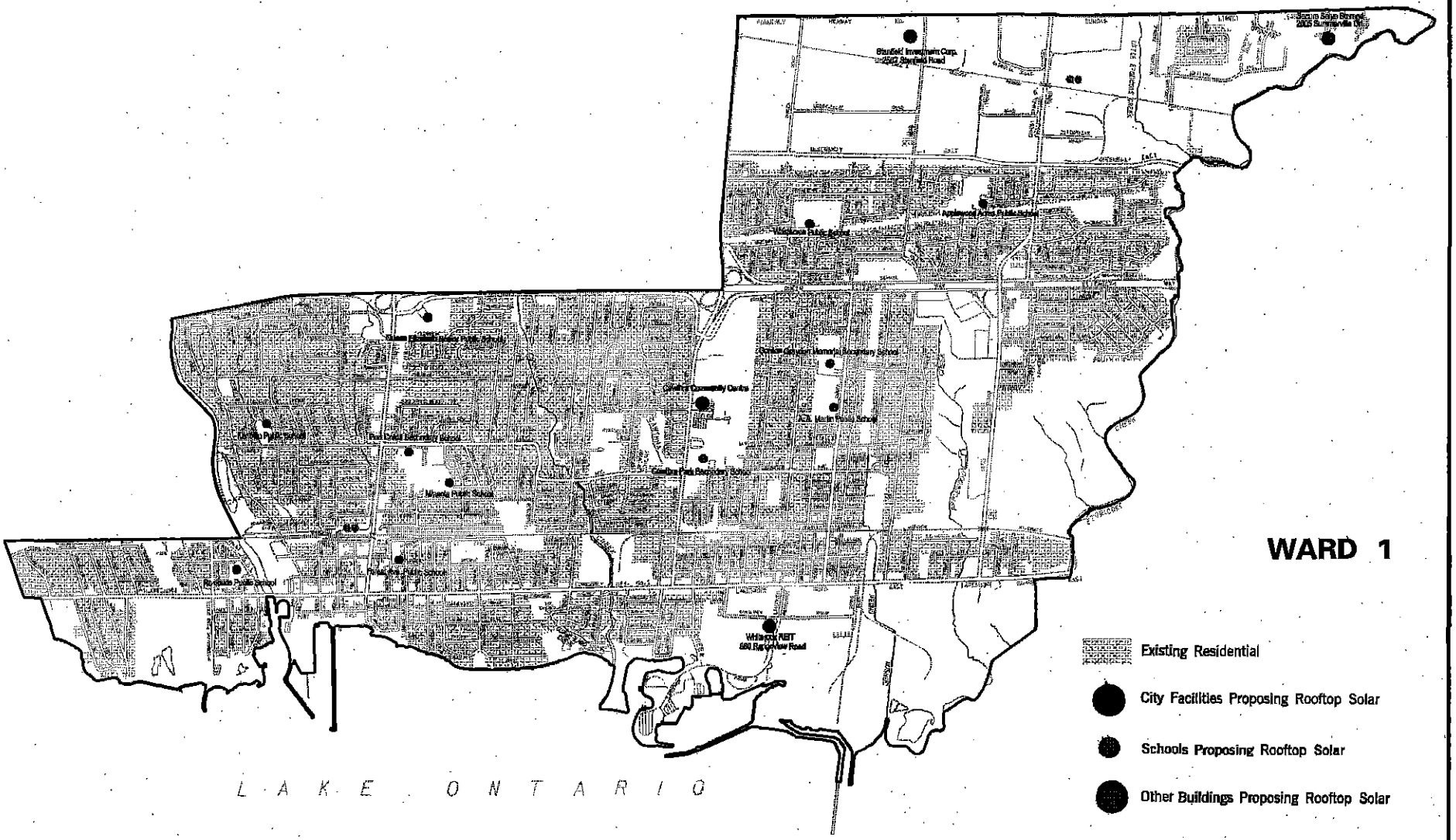

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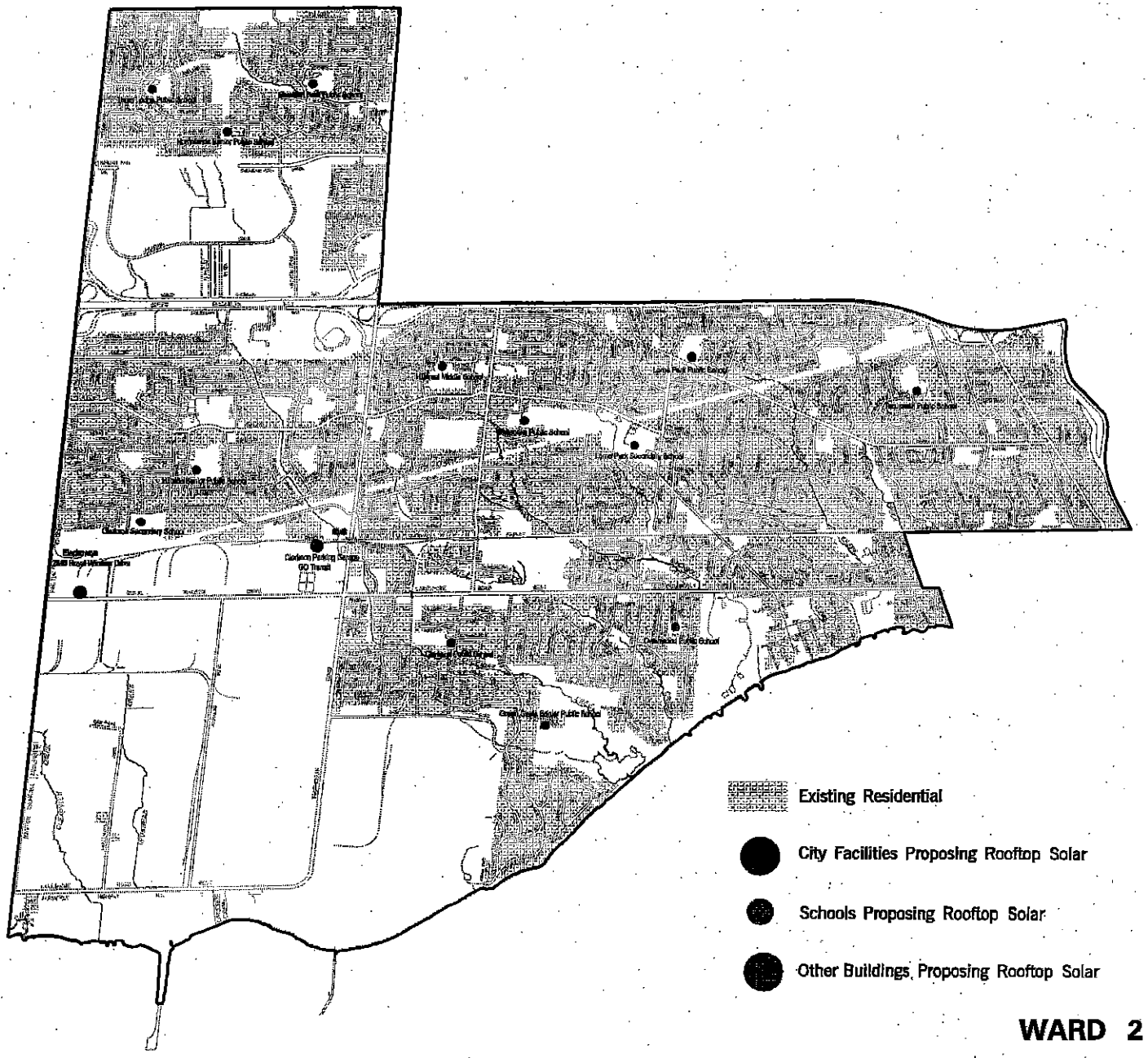

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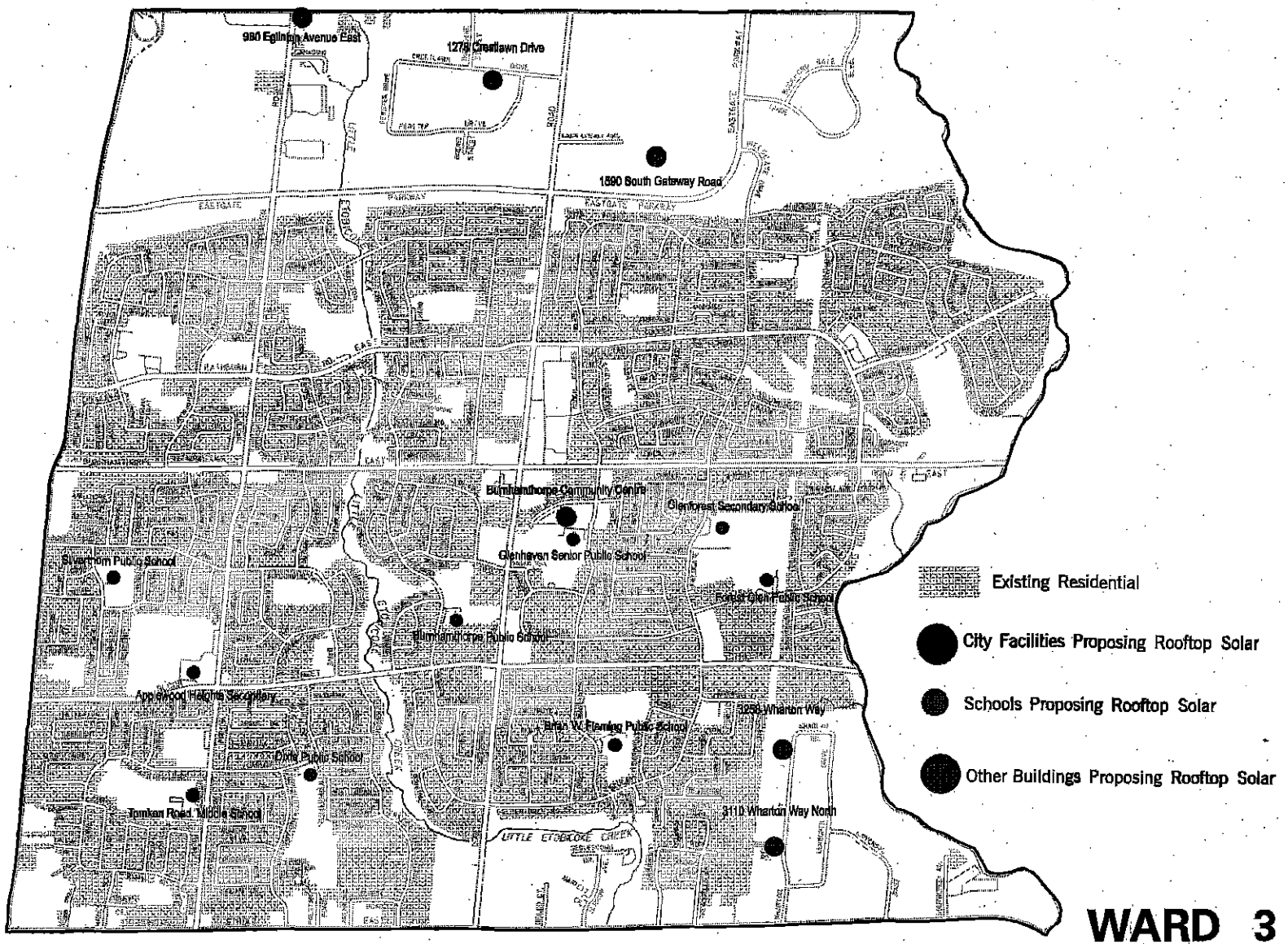

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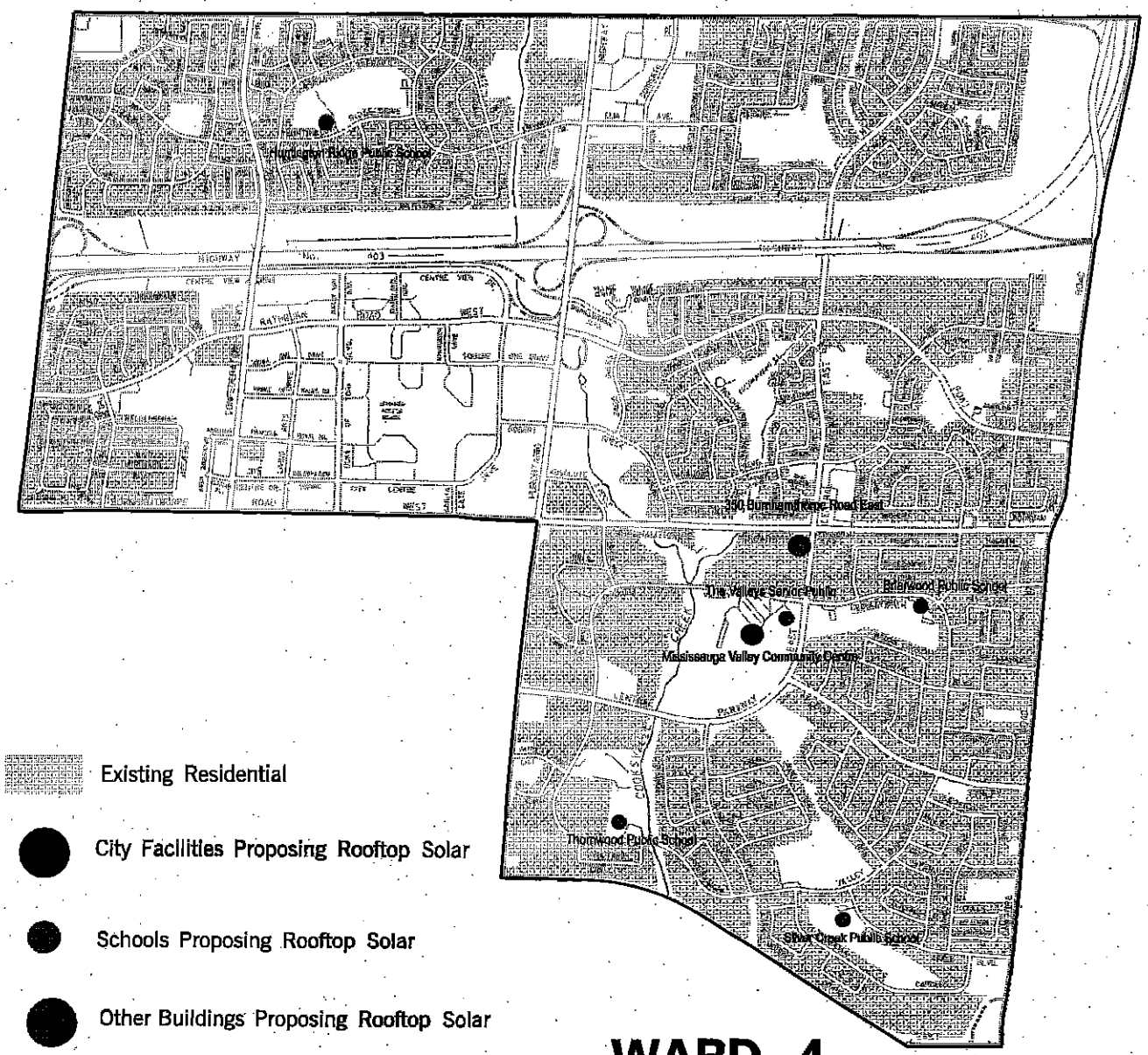

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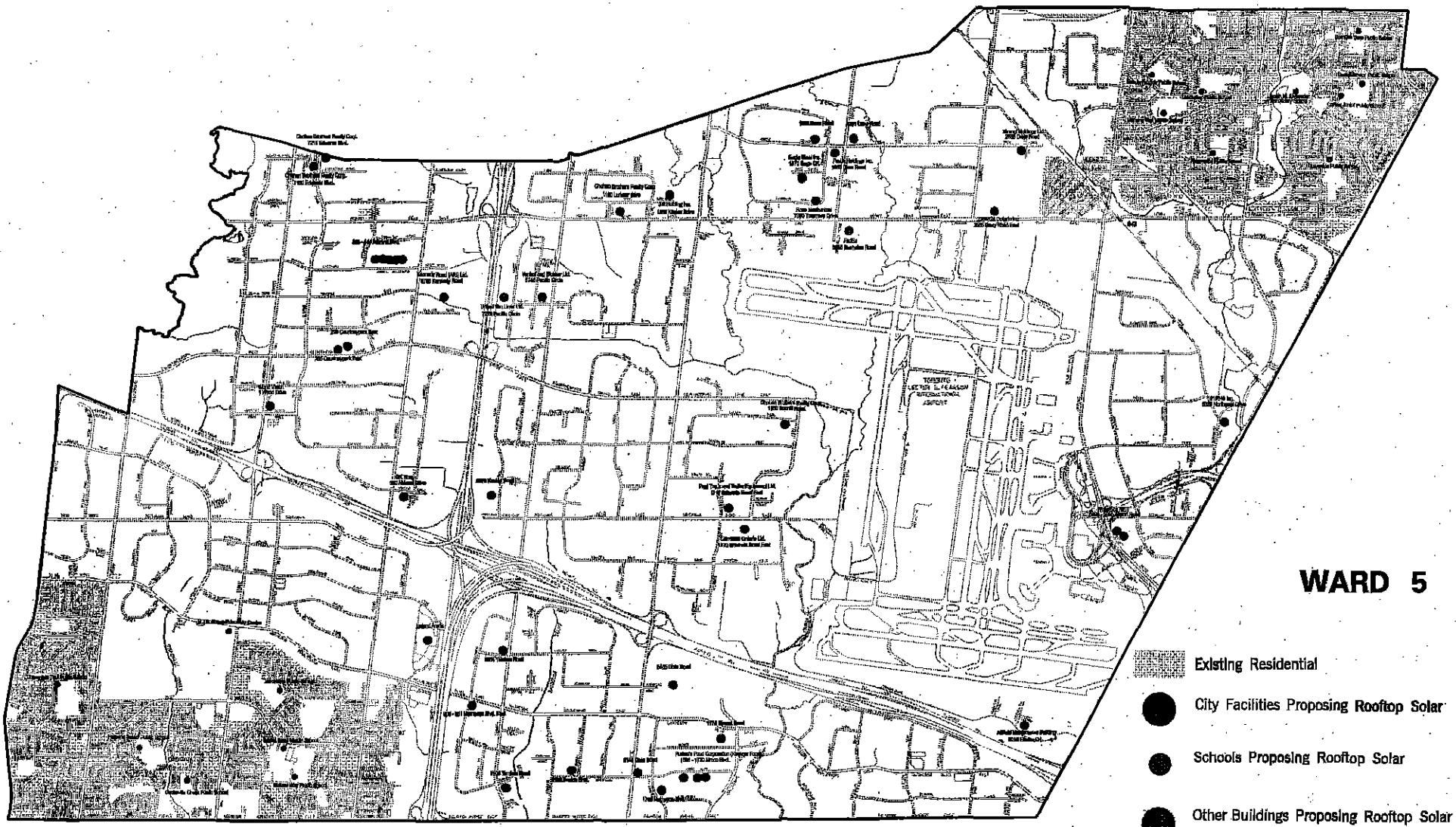

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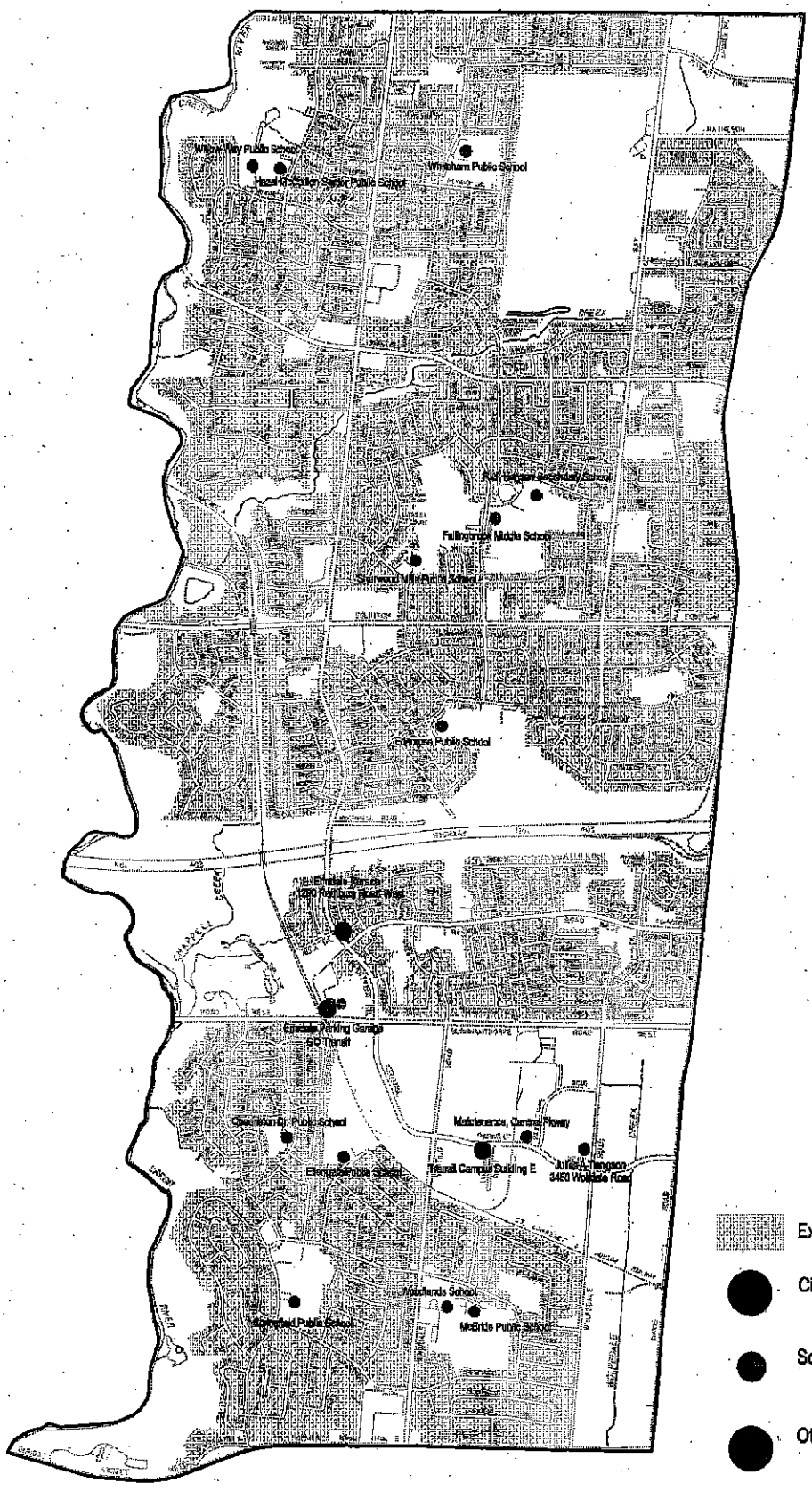

WARD 6

- Existing Residential
- City Facilities Proposing Rooftop Solar
- Schools Proposing Rooftop Solar
- Other Buildings Proposing Rooftop Solar

PROPOSED ROOFTOP SOLAR PROJECTS

APPLYING TO THE ONTARIO POWER AUTHORITY FEED-IN TARIFF PROGRAM

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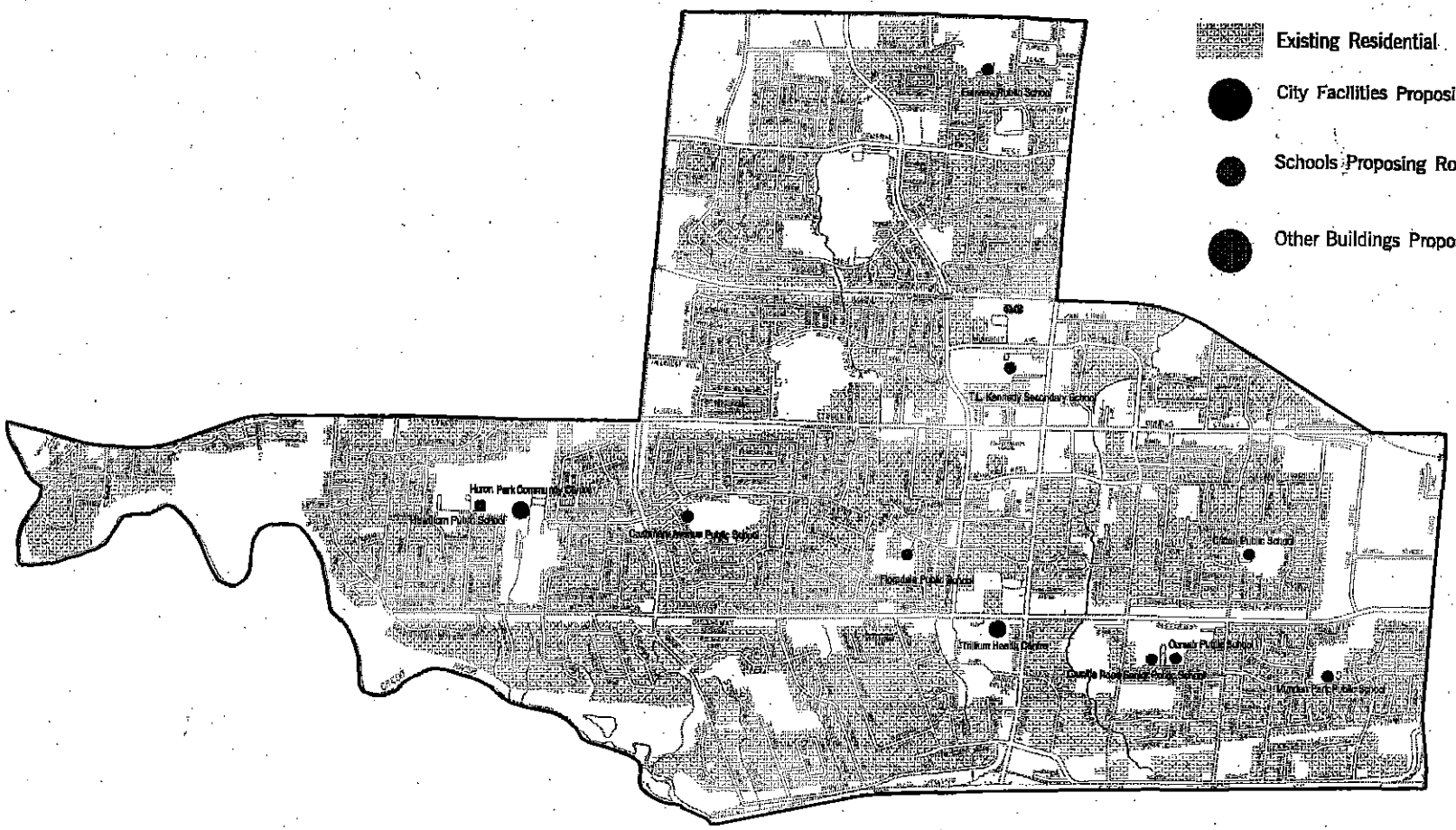

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PROPOSED ROOFTOP SOLAR PROJECTS

APPLYING TO THE ONTARIO POWER AUTHORITY FEED-IN TARIFF PROGRAM

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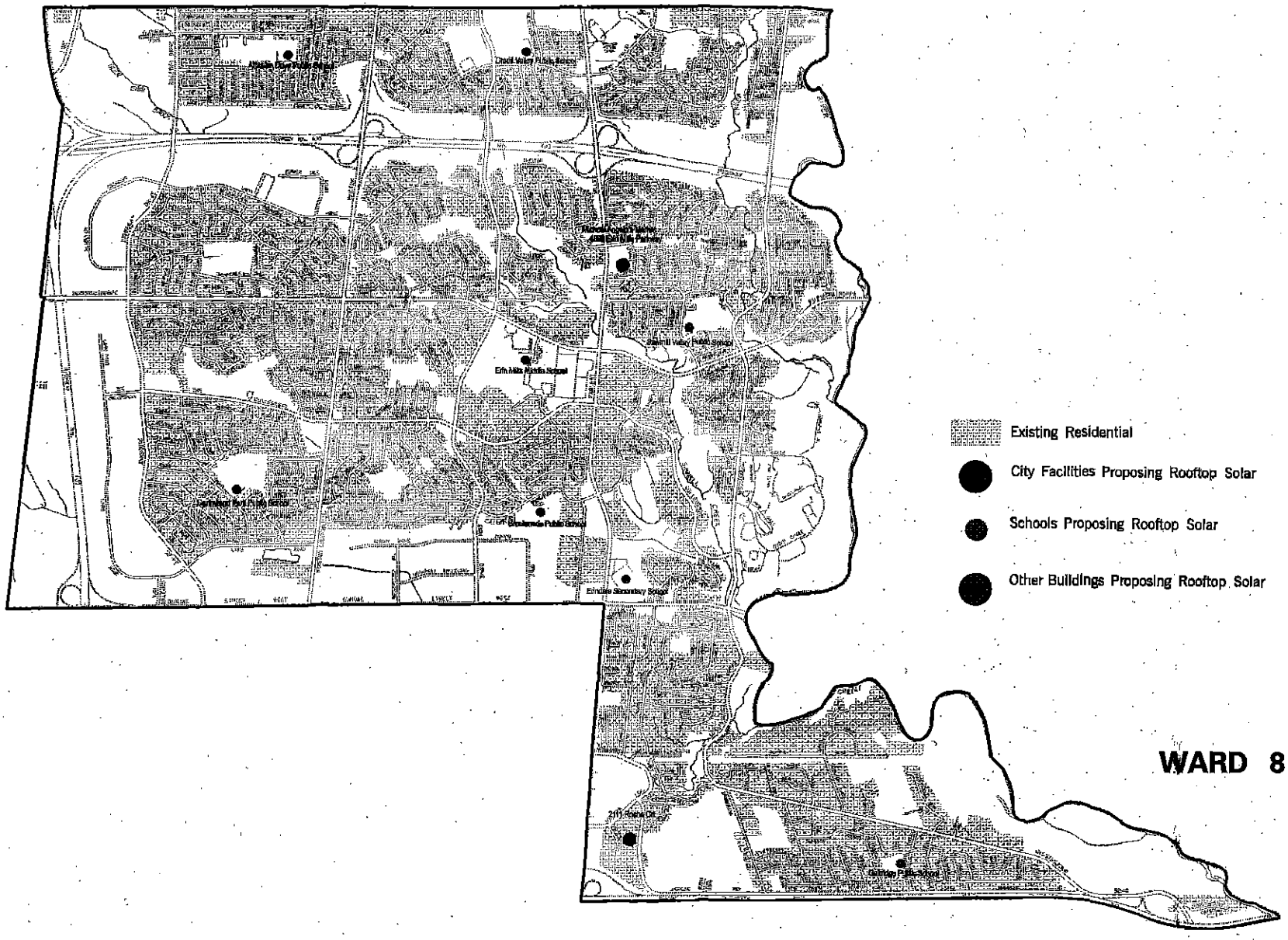

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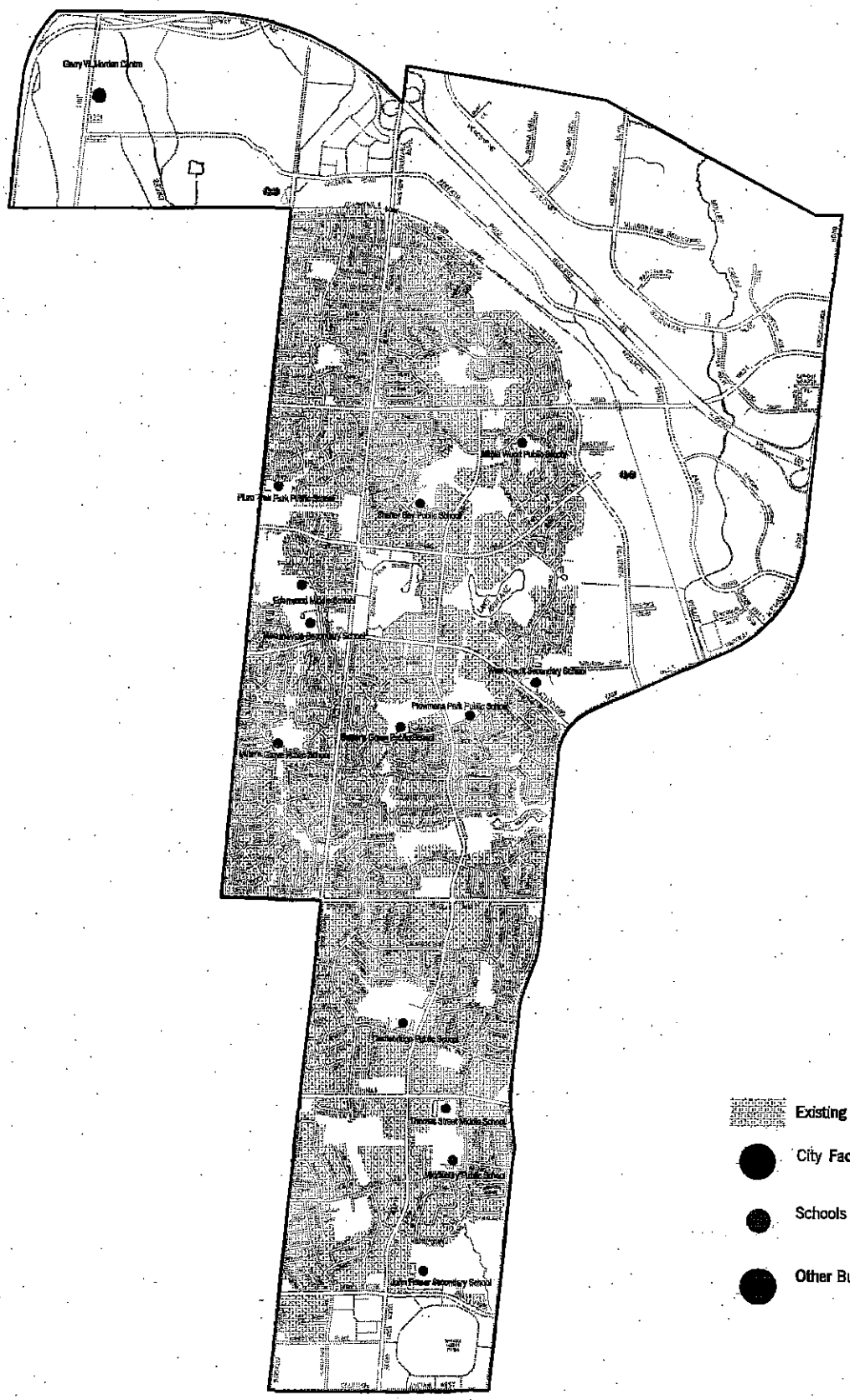

WARD 9

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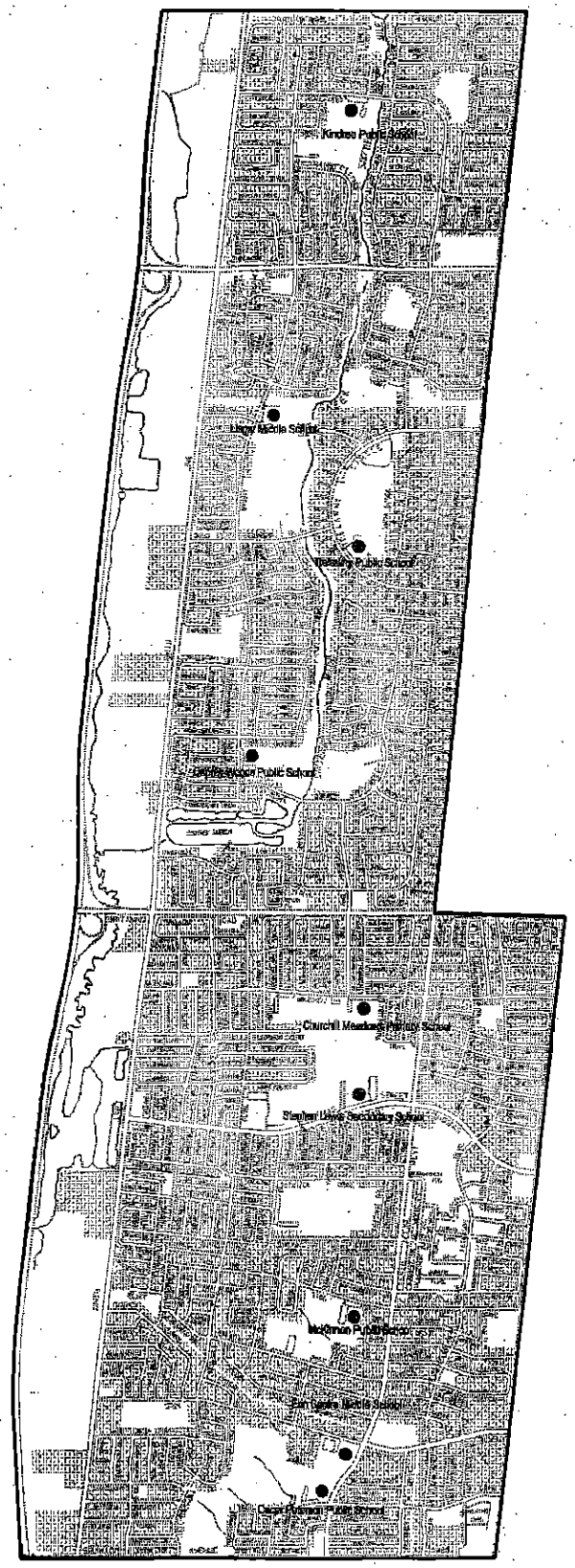

Existing Residential

City Facilities Proposing Rooftop Solar

Schools Proposing Rooftop Solar

Other Buildings Proposing Rooftop Solar

WARD 10

PROPOSED ROOFTOP SOLAR PROJECTS

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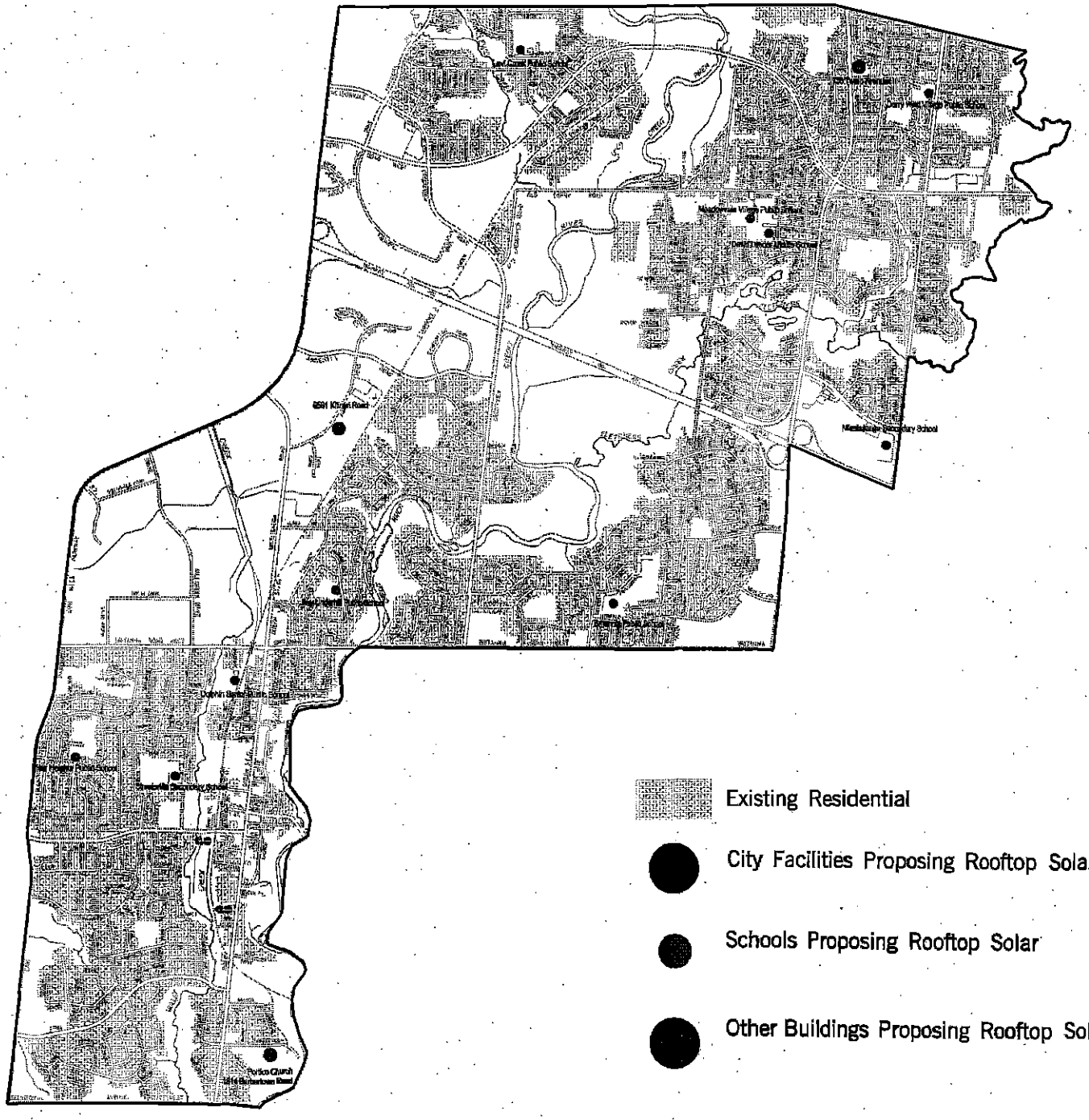

WARD 11

PROPOSED ROOFTOP SOLAR PROJECTS

APPLYING TO THE ONTARIO POWER AUTHORITY FEED-IN TARIFF PROGRAM

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NOVEMBER 20 2012

New Revised Motion for
CITY OF MISSISSAUGA COUNCIL SUPPORT RESOLUTION
FOR ROOFTOP SOLAR GENERATION PROJECTS

RESOLUTION NO.:_____ DATE: _____

WHEREAS the Province's Feed-in Tariff (FIT) Program encourages the construction and operation of rooftop solar generation projects ("Rooftop Solar Projects");

AND WHEREAS one or more Rooftop Solar Projects may be constructed and operated in the City of Mississauga;

AND WHEREAS, pursuant to the rules governing the FIT Program (the "FIT Rules"), applications whose Rooftop Solar Projects receive the formal support of local municipalities will be awarded priority points, which may result in these applicants being offered a FIT contract by the Province prior to other persons applying for FIT contracts;

AND WHEREAS the *Green Energy Act, 2009,* S.O. 2009, c.12, as amended, stipulates that a municipal Official Plan and Zoning By-law does not apply to a renewable energy undertaking;

AND WHEREAS the *Building Code Act, 1992,* S.O. 1992, c.23, as amended, applies to renewable energy projects and, as such, each Rooftop Solar Project will require a building permit issued by the City of Mississauga Planning and Building Department;

AND WHEREAS, pursuant to the *Ontario Heritage Act,* R.S.O. 1990, c.0.18, as amended, each Rooftop Solar Project that is proposed to be located on a property listed on the City of Mississauga's Heritage Register or designated as a heritage property will require a Heritage Permit from the City of Mississauga prior to work commencing on such properties;

NOW THEREFORE BE IT RESOLVED THAT:

The Council of the City of Mississauga supports the construction and operation of Rooftop Solar Projects anywhere in the City of Mississauga, including but not limited to Rooftop Solar Projects on City-owned buildings.

And further, that this Resolution's sole purpose is to enable the participants in the FIT Program to receive priority points under the FIT Program, and that this Resolution may not be used for the purpose of any other form of municipal approval in relation to a FIT application or a Rooftop Solar Project or for any other purpose.

And further, that resolution 0170-2012 and resolution 0219-2012 be repealed.

And further, that Council support shall lapse twelve (12) months after its adoption by Council.

3(i)(i)

Appendix 5

City of Mississauga

Rooftop Solar Projects
applying for the Feed-in Tariff FIT 2.0 Program
seeking City of Mississauga Council Support Resolution

Checklist

The following information is required to be submitted to the City of Mississauga when requesting a Council Support Resolution.

Applicant Information:
(*note primary contact)

Name	Address & Postal Code	Contact Information: (telephone, mobile, e-mail)
Owner of property		
Applicant		
Agent		

Municipal Address of Subject Lands:

Kilowatts (kW) generated:

Project Summary:

Please provide a brief description of the proposed project.

3(j)(j)

Are proposed solar installations (please check):

- ☐ Fixed
- ☐ Moveable
- ☐ Flat
- ☐ Angled

YES	NO	
☐	☐	Will the proposed installations form significant visible projections above beyond the wall or roof line?
☐	☐	Will any noise be generated by the proposed installations?
☐	☐	Will the proposed installations form sources of reflected light?
☐	☐	Will the proposed installations present a danger related to sliding ice?
☐	☐	Has a structural assessment been undertaken for the roof installation?
☐	☐	Will measures be implemented to ensure the roof membrane is protected?
☐	☐	Will there be a main cut-off or breaker readily accessible to emergency services?
☐	☐	Will there be proper labelling of all Solar Photovoltaic equipment?
☐	☐	Will there be adequate pathways on the roof for access during an emergency situation?
☐	☐	Are the proposed installations to be fitted to a listed or designated heritage structure?

Memorandum

TO:	Environmental Advisory Committee Meeting Date: December 11, 2012
FROM:	Brenda E. Osborne, Director, Environment Division, Community Services Department
DATE:	November 26, 2012
SUBJECT:	**Environmental Advisory Committee** **November 24, 2012 Off-Site Meeting Summary**

On Saturday, November 24, 2012, members of the Environmental Advisory Committee (EAC) attended an off-site meeting to discuss potential projects for the Committee to focus on and take a leadership role in developing over the next few years. The meeting was held at the Hazel McCallion Campus of Sheridan College in Mississauga, and was facilitated by Karyn Stock-MacDonald, a Business and Innovation Coach with the City of Mississauga. Attachment 1 provides a copy of the meeting agenda.

The following EAC members, guests and staff attended:

- Councillor George Carlson, Ward 11, EAC Member (Chair)
- Michael DeWit, Citizen Member (Vice-Chair)
- Councillor Jim Tovey, Ward 1, EAC Member
- Councillor Frank Dale, Ward 4, EAC Member
- Dr. Brad Bass, Citizen Member
- Elaine Hanson, Sheridan College, Office for Sustainability
- Lucas Krist, Peel Environmental Youth Alliance
- Val Ohori, Citizen Member
- Lucia Salvati, University of Toronto at Mississauga
- Diana Yoon, Peel Environmental Youth Alliance
- Lea Ann Mallett, EcoSource (Agency Liaison)
- Mary Bracken, Environmental Specialist
- Yvonne Koscielak, Public Art Coordinator
- Julius Lindsay, Community Energy Specialist
- Brenda Osborne, Director, Environment Division
- Karyn Stock-MacDonald, Business and Innovation Coach
- Lisa Urbani, Environmental Research Assistant

Discussion Topics

The format of the meeting included brief presentations on five projects for EAC's consideration including:

- a public art opportunity along Burnhamthorpe Road West;
- developing the concept of "Earth Markets";
- designing an Environmental Community Grant Program;
- establishing potential synergies/partnership opportunities with Sheridan's Integrated Energy & Climate Change Master Plan; and
- developing a Greening Events policy.

Each project was introduced with a brief description including goals and examples of similar projects, followed by a facilitated discussion of likes, concerns, new ideas and potential role for EAC.

Themes

After discussing each project individually, the group identified emerging themes. A number of themes were noted, including:

- partnership opportunities for business and innovation / need for more
- need to consider how business can help the community / involve the Economic Development Office
- need for communication / suggestion to use Celebration Square screens to communicate environmental messages
- need to make things easy and accessible; "reduce red tape" associated with grant program

Project Preference

Following a discussion about all of the projects and a dotting preference exercise, the group identified environmental grants (including recognition) and public art as the top two projects where EAC's input would add the most value and have the greatest impact. This was based, in part, on the role EAC may play in these projects, as identified below, as well as the recognition that the public art project will most likely proceed with or without EAC's involvement, whereas without the support of EAC and EAC Councillors during the budget process, an environmental community grant program has little chance of success.

Role of EAC

During the discussion of environmental grants, EAC members identified the importance of community recognition and expressed interest in combining awards or other forms of recognition in the grant program. The main roles identified for EAC in the environmental community grant project (including recognition) included:

- providing advice on the Terms of Reference (project eligibility, jury process)
- reviewing staff recommendations for approval/project selection
- championing the grant program and lobbying Council for funding support
- mentoring and providing guidance to project implementation
- helping incorporate/integrate other components such as community gardens, culture, innovation, business
- measuring and promoting project successes

For the public art project, EAC believed the Committee's involvement would contribute to a different project, one that would have a stronger blend of environmental education, green infrastructure/innovation and science. The main role identified for EAC in this project included:

- providing input into the project Terms of Reference with respect to environmental components (e.g., project eligibility, materials, jury process);
- suggesting locations; and
- providing input into a public environmental education and promotional campaign to support the project.

The group concluded that they want to focus on developing an environmental grant program as well as contribute to the public art project.

Next Steps

Environment Division staff will follow up with the Public Art Coordinator to review the opportunity and process for involving EAC in the Burnhamthorpe public art project and request that a status update be brought to EAC in early 2013.

Environment Division staff will bring a proposal to EAC early in 2013 with options on how to develop an environmental community recognition and grant program that incorporates the interests expressed by EAC.

Brenda E. Osborne
Director
Environment Division
Community Services Department

Attachment 1: Environmental Advisory Committee November 24, 2012 Off-Site Meeting Agenda

EAC Off-Site Meeting, Saturday, November 24, 2012

Karam Daljit Boardroom, 4th Floor, Hazel McCallion Campus, Sheridan College

9:00 a.m. to 12:00 noon

Agenda

9:00	9:00 – 9:30	Breakfast & Networking	
9:30	9:30 – 9:40	Welcome, Purpose and Introductions	Councillor Carlson / Brenda Osborne
5 mins	9:40 – 9:45	Agenda Review	Karyn Stock-MacDonald (Facilitator)
1 hr 45 mins	9:45 – 11:30	Discussion Topics • Public Art • Earth Markets • Environmental Community Grant Program / Community Gardens • Sheridan's Integrated Energy & Climate Change Master Plan • Greening Events • Other	Yvonne Koscielak, Public Art Coordinator Brenda Osborne Brenda Osborne Elaine Hanson Brenda Osborne EAC Members
15 mins	11:30 – 11:45	Overall Preference Discussion	Karyn Stock-MacDonald
5 mins	11:45 – 11:50	Dotting Preferences	EAC Members
10 mins	11:50 – 12:00 noon	Next Steps	All
	12 noon	Adjourn	

Memorandum

TO:	Environmental Advisory Committee Meeting Date: December 11, 2012
FROM:	Julius Lindsay, Community Energy Specialist, Environment Division, Community Services Department
DATE:	November 23, 2012
SUBJECT:	**Financing Energy Efficiency Through Local Improvement Charges and the Changes to the Municipal Act, 2001**

Introduction to Local Improvement Charges

In the course of ongoing city management, cities complete large neighbourhood improvements on public land, such as replacing a sewer, creating a park, building a sound barrier, etc. These are known as local improvements. A local improvement is an infrastructure improvement that is deemed to benefit a specific neighbourhood. Local improvements are sometimes funded by using Local Improvement Charges (LICs). A LIC is a charge that is added to the property tax of residents in the area that would benefit from the local improvement. The Municipal Act states that LICs can be used if a percentage of residents in an area agree to the local improvement and agree to the charges being levied. The value of the work is split up between affected property owners and can be paid back in a lump sum or over a number of years.

What Has Changed?

O. Reg. 322/12, signed by former Minister of Municipal Affairs and Housing Kathleen Wynne in October 2012, has amended O. Reg. 586/06 of the Municipal Act, 2001 to allow energy efficiency upgrades, water conservation projects, and renewable energy projects on private property to be financed through LICs.

In the case of using LICs for retrofits, the value of the work would be the responsibility of the property owner. The financing would be attached to the property and not the person, and would be paid back by a charge added to the property tax over a period of amortization. This would overcome two of the primary barriers to home retrofits, namely long payback periods and large upfront costs.

In the first instance, people who do not plan to stay in their home for a long time would have greater incentive to undertake retrofits and realize the savings even over the short term. This is because even if and when they sell their property, the responsibility of paying the rest of the loan transfers to the new homeowner, since it is attached to the property.

The second major barrier this application of LICs overcomes is it allows owners to complete deep retrofits on their properties without having to pay the full capital costs upfront. It gives access to low interest financing for anyone eligible to participate in the program, as it would not be based on income level. Additionally, in the ideal scenario, the energy savings would offset the payments on a monthly or yearly basis.

The Toronto Atmospheric Fund is creating a working group on this topic. This Collaboration on Home Energy Efficiency Retrofits in Ontario (CHEERIO) will develop the terms and parameters for a pilot program. Municipalities are being encouraged to participate in one of two ways:

- Working group member – Participate and fund the design and parameters of a pilot
- Advisory group member – Review any materials produced by, give input to, and kept abreast of the work done by the working group

Potential Opportunities

This amendment to the Municipal Act creates a number of opportunities for the City including:

- Aiding in reaching City and Peel Region greenhouse gas community emission reduction targets – more comprehensive retrofits completed which leads to greater efficiency and emission reductions per site
- Economic stimulus – creates jobs and business profits
- Potentially delivered at net zero cost to the City
    - ability to support residential energy efficiency at no added cost to the City
    - administrative cost could be covered in charges to the residents
- City can control quality of contractors and work done, as well as cost effectiveness of the retrofits done
- Opportunity to have results measured and verified as a part of program
- Mississauga has implemented LICs in the past – process can be repeated

Potential Challenges

Some challenges or unknowns associated with this new opportunity are:

- A program such as this has never been implemented in Ontario
- Upfront funding must be found for program development and funding for initial projects
- Regulation states "…the municipality may undertake the work as a local improvement…" – requires further clarification/program development – is the City hiring the contractor to do the work?
- LICs may be perceived by residents as a property tax increase - must be shown as net revenue neutral/positive for homeowner
- Technical/industry capacity – are there enough qualified contractors and home assessors to support the program? How will industry participation be determined?
- "Post-incentive era" – home owners are accustom to receiving money back (e.g. cash rebates) for this type of work
- How will eligibility be determined? What retrofits will qualify?

Next Steps

The next steps with regard to these changes include Environment Division staff participating in the CHEERIO initiative as an advisory member. As well, Environment Division staff will be informing and educating other groups in the City about the regulation changes, and the impact of those changes.

Julius Lindsay
Community Energy Specialist
Environment Division
Community Services Department

Upcoming Agenda Items and Environmental Advisory Committee (EAC) Role

Legend: Potential Role for EAC	
Comments (Provide feedback for consideration.)	**Leadership** (Participate in event or lead external group participation.)
Community Engagement (Champion LGMP awareness campaign, promote Living Green blog, etc.)	**Receive** (For information.)
Direction (Provide direction to staff.)	**Recommendation** (To General Committee.)
Deputation (Present to General Committee, Council, other.)	**Sub-committee** (To further develop or research initiative.)

Year | Quarter	Item	Description	Potential EAC Role
2013 | Q1	Let Your Green Show – Phase 2	Announcing Phase 2.	Receive
	Corporate and Community Greenhouse Gas (GHG) and Criteria Air Contaminant (CAC) Inventories	Updated GHG and CAC inventories' results will be presented and used to benchmark and prioritize future efforts to reduce local sources of emissions.	Recommendation
	Corporate Environmental Principles Policy Update	An update is planned to better align the policy with environmental principles in the Strategic Plan and LGMP.	Receive
	Home Wood Stoves	A report back subsequent to the April 2012 EAC meeting where home wood stoves were discussed.	Direction
2013 | Q2	Living Green Master Plan (LGMP) Update	Annual progress report.	Receive

Other Anticipated Items	
Item	**Description**
Nuisance Weed and Tall Grass Control By-law	The City's Nuisance Weed and Tall Grass Control By-law is scheduled to be revised as per the LGMP.
Green Development Strategy (GDS)	An update on GDS implementation.
Waste Management	An update on various waste-related initiatives.
Drive-Throughs	An update on drive-throughs.
Idling Update	An update on idling in Mississauga.
Transportation Strategy	Finalized version of interim strategy.
Smoke-Free Outdoor Spaces	Update to EAC subsequent to a deputation entitled "Smoke-Free Outdoor Spaces Policy Options" at the Committee's November 9, 2010 meeting.
Lake Ontario Integrated Shoreline Strategy (LOISS)	Update on potential position for an EAC representative on a LOISS advisory committee.
Quest 2013	Ontario Caucus Conference.
Corporate Energy Conservation Plans	The new Provincial *Green Energy Act* (2009) requires municipalities to provide corporate energy conservation plans for all municipally owned and operated buildings and to report annually on actual performance against plans.
Stormwater Quality Control Strategy Update	Update of the City's strategy for managing and improving the quality of stormwater runoff.

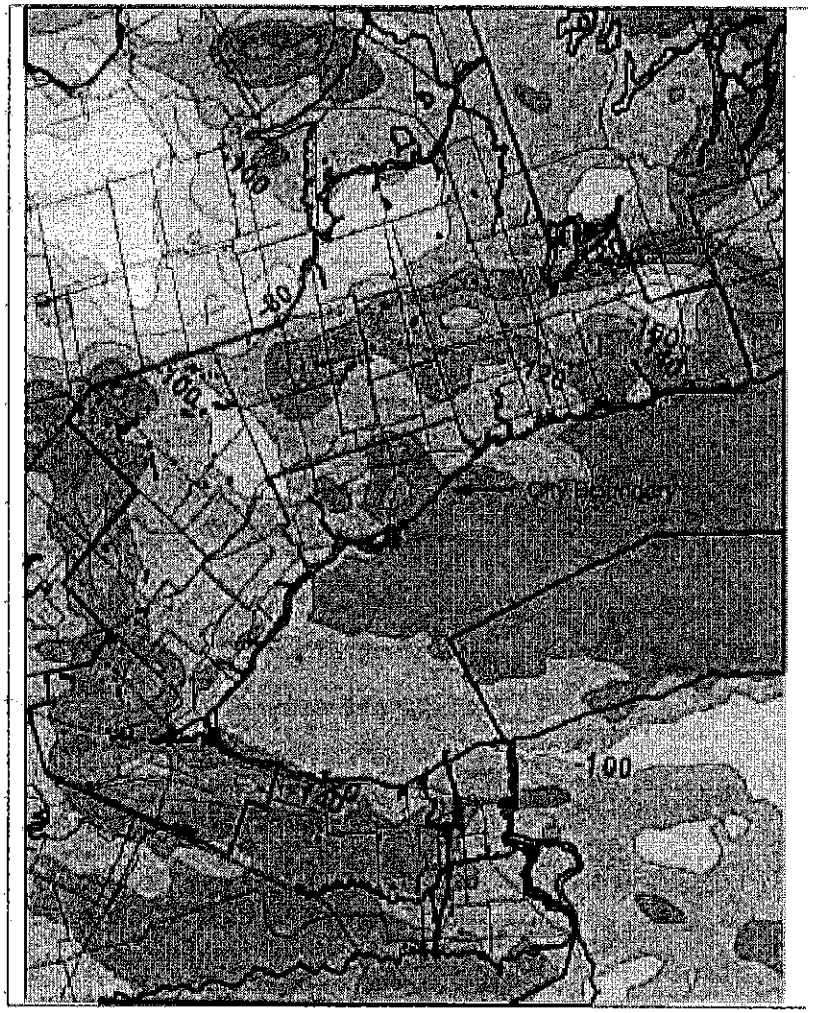
STATUS OF OUTSTANDING ISSUES FROM THE ENVIRONMENTAL ADVISORY COMMITTEE (EAC)
Prepared by Karen Morden, Legislative Coordinator, for the December 11, 2012 EAC Agenda

EAC MEETING FIRST DISCUSSED	ISSUE	EAC RECOMMENDATION/DIRECTION	STATUS
Feb/12	Transportation Strategy Presentation	Michael DeWit, Vice-Chair, indicated that a presentation on the transportation strategy would be beneficial to the Committee.	**May 1/12 EAC Meeting Update:** Ms. Osborne added that she did not have a specific timeline for the transportation strategy at this time.
Apr/12	Smoke from Home Wood Stoves	EAC-0018-2012 That the Memorandum dated March 13, 2012 from Mayor Hazel McCallion with respect to smoke from home wood stoves be received and referred to Environmental Management staff for further review and preparation of a draft by-law, in consultation with Legal staff, and a Corporate Report on short- and long-term policy options (including addressing the improper use of home wood stoves and regulation by the provincial government) for home wood stoves for consideration at a future Environmental Advisory Committee meeting.	**May 1/12 EAC Meeting Update:** Ms. Osborne noted that staff is working with Legal staff on the smoke from home wood stoves issue and that this matter was being targeted for the Committee's September or October 2012 meetings.
Sept/12	Potential Ban of Plastic Shopping Bags in Mississauga	EAC-0039-2012 1. That the Corporate Report dated July 26, 2012 from the Commissioner of Community Services, entitled "Potential Ban of Plastic Shopping Bags in Mississauga," be received; and 2. That the Environmental Advisory Committee recommends that the potential ban of plastic shopping bags in Mississauga be referred to the Region of Peel's Waste Management Committee for further research and recommendations to the Region of Peel's Regional Council and the City of Mississauga's Council.	

TORONTO'S FUTURE WEATHER & CLIMATE DRIVER STUDY:

OUTCOMES REPORT

Summary of the SENES Consultants Ltd Study by Toronto Environment Office
October 30, 2012



Less Snowfall Expected in 2040-2049 (in centimetres)

- 140 centimetres less in parts of Toronto
- 160 centimetres less on parts of the Oak Ridges Moraine

Why We Did What We Did

Clear Direction *from City Council re: policies and actions including*

Climate Change Action Plan (2007)
Ahead of the Storm (2008)

To Prepare the City for the Future

The City needed Toronto & GTA specific Weather & Climate Information unavailable from Environment Canada.

Toronto Environment Office uses an innovative approach to modelling climate and weather.

We combine modelling technologies
Global Climate Models (GCM)
Regional Climate Models (RCM)
Local Weather Models (WRF)

Advisors: *Environment Canada, Ministry of Environment, Toronto Region Conservation Authority*

Consultants: *SENES + Hadley UK*

INTRODUCTION

In order to more effectively plan municipal infrastructure investment and provision of services, the City of Toronto needs to know what currently influences Toronto's present weather and climate. The City needs to determine how these influences are likely to change, and how severe the consequences are likely to be in the future. In simple terms, the City of Toronto needs a better understanding of why Toronto gets the weather and climate it gets now and what weather and climate it can expect to get in the future.

For large cities with high density populations and concentrated critical infrastructure, climate and weather can have a significant impact on economic activity and municipal services. Existing global and regional climate models have not provided cities, such as Toronto, with sufficiently tailored information to understand and address specific local future impacts.

The *Toronto's Future Weather & Climate Driver Study* aims to help understand what projections on future climate mean for the City of Toronto. By improving the level of certainty about climate related weather changes, the City will be better guided in making investment and budgetary decisions regarding infrastructure and service provision responsibilities.

The study was undertaken by SENES Consultants, based in Richmond Hill. SENES works on projects around the globe and specializes in climate modelling. The Toronto Environment Office commissioned the study to support the City's climate change policies.

WHY DID THE CITY UNDERTAKE THE CLIMATE DRIVERS STUDY?

There are three reasons why the City cannot solely rely on the existing climate projections derived from Global and Regional Climate Models to fully understand current and future climate and weather patterns for Toronto:

1) ***The Great Lakes*** – The Great Lakes have an important influence on Toronto's climate and weather. Without the Great Lakes, Toronto would have an extreme continental climate instead of its more moderate continental climate. Global and regional climate models do not adequately represent the moderating effect of the Great Lakes on the City's climate and weather. The implication is that the City cannot adequately predict future climate change impacts for Toronto from these models alone.

2) ***Lack of focus on urban climate and weather impacts*** – Large urban centres, such as Toronto, comprise a small percentage of Canada's land mass. However, they are home to a substantial percentage of Canada's economic activity and population (80% of the Canadian population live in urban areas). Local impacts of future climate changes on city and urban populations are not sufficiently detailed in the global and regional climate models to inform cost effective infrastructure planning and adaptation.

3) ***The need for weather and climate 'extremes' rather than 'averages'*** – The operation of critical infrastructure such as the electrical grid, water treatment plants, sewers and culverts, public transport and roads are sensitive to particular temperature and weather thresholds. Beyond these thresholds infrastructure may have reduced capacity or may not function at all. While we cannot ignore gradual climate change, variation in the patterns of extreme weather pose a particular challenge to the operation of municipal and provincial infrastructure. The focus of global and regional climate models on climate averages are unlikely to provide cities, such as Toronto, with adequate insight into extreme weather projection changes necessary for prudent infrastructure management.

Monitored weather events identified in Table 1 below (Environment Canada) show an increasing occurrence of record years between 2000 and 2009. This data suggests that extreme weather events are changing more rapidly than predicted by the models built around the standard 30-year climate averages.

New Approach

The approach was new and innovative *when this project was conceived.*

The approach *taken has been* ***very successful (proved*** *value of approach).*

Approach subsequently adopted by *the National Center for Atmospheric Research, and by the Ministry of the Environment with the University of Toronto.*

To Answer New Questions

Included Influence of the ***Great Lakes, Niagara Escarpment*** *and the* ***Oak Ridges Moraine.***

Examined a ***10 Year Period*** *(not 30 Years)*

Wanted data and information concerning the ***future "extremes"-of-weather*** *rather than the* ***future "means"-of-climate.***

Recent Empirical Data

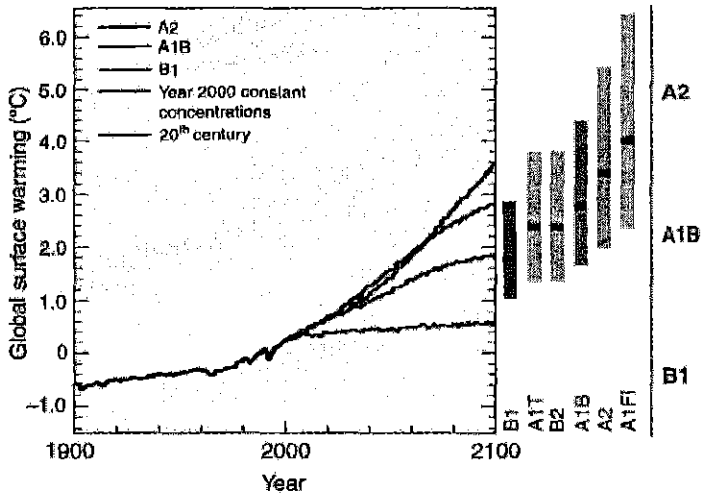
Globally, ***2010*** *ranked as the* ***warmest year on record,*** *as was 2005 and 1998 before it.*
The ***10 warmest years on record*** *have* ***all*** *occurred* ***since 1998.***

Over the ten years from ***2001 to 2010,*** *global temperatures have averaged 0.46°C above the 1961-1990 average, and are* ***the highest temperature increase ever recorded for a 10-year period*** *since the beginning of instrumental climate records.*

Table 1: Record Weather Events in Toronto by Year in the Period 2000-2009 Provide Rationale For Study

Year	Record Events
2000	Wettest summer in 53 years with 13% more precipitation than normal.
2001	Driest growing season in 34 years; first ever heat alert; 14 nights with temperatures above 20°C (normal is 5 nights).
2002	Driest August at Pearson Airport since 1937; warmest summer in 63 years; 5th coldest Spring.
2003	Rare mid-Spring ice storm – Pearson Airport used a month's supply of glycol de-icer in 24-hours.
2004	Year without a summer; May rainfall in Hamilton set an all-time record; and another all-time record 409 mm rainfall was set at Trent University in July which was equivalent to 14 billion litres of water in 5 hours (a 200 year event).
2005	Warmest January 17 since 1840; January 22nd blizzard with whiteouts; warmest June ever; number of Toronto days greater than 30°C was 41 (normal is 14); August 19 storm washed out part of Finch Avenue.
2006	23 tornadoes across Ontario (14 normal); record year of major storms; record one-day power demand of 27,005 MW due to summer heat.
2007	Protracted January thaw; 2nd least snow cover ever in Toronto (half the normal amount); snowiest Valentine's Day ever; chunks of ice fell from CN Tower; 2-3 times the normal number of hot days in the summer; record latest-in-season string of +30°C days around Thanksgiving.
2008	Toronto's 3rd snowiest winter ever; record for highest summer rainfall.
2009	3rd rainiest February in 70 years; Hamilton had a 100-year storm; one of the wettest summers on record; tornados hit Vaughan-Woodbridge area in late August; an unusually mild and storm-free November in Toronto – Downtown had a record "no snow" for the first time ever – first snow-free November at Pearson Airport since 1937.
2012	Toronto's earliest ever official heat wave (June 19-21)
Also	Three 1 in 100 year storms in Toronto in less than 12 years: July 2000, August 2005, July 2012.

International Panel on Climate Change (IPCC) Scenarios of Future Climate Driven by Population, Economics, and Technology Adoption[1]



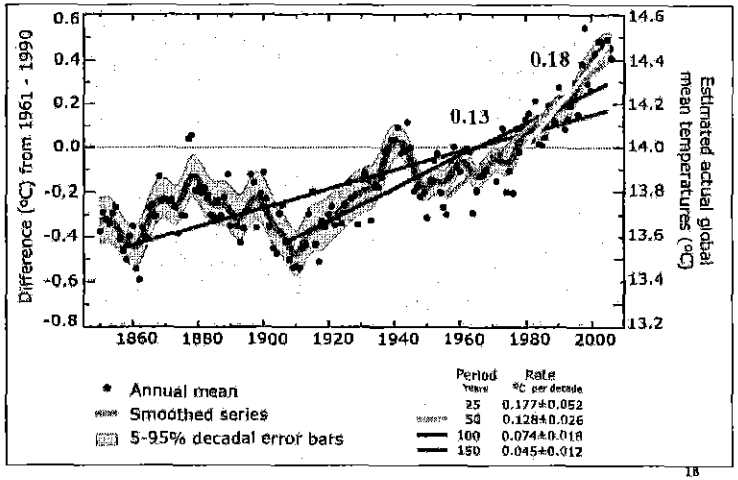
IPCC Emission Scenarios

B1 ***Low Growth (Integrated World)***
A1B ***Moderate Growth (Balanced Energy Use)***
A2 ***High Growth (Divided World)***

The City's approach adopted Scenario A1B regarded as an upper-middle of the road scenario (i.e., not an extreme scenario) into the future. Also note that A1B & A2 are essentially similar until 2060.

[1]*From Pachauri, R.K. and Reisinger, A. (Eds.)"Climate Change 2007: Synthesis Report Contribution of Working Groups I, II and III to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change, (2007) at p 46. Accessed at* ***http://www.ipcc.ch/pdf/assessment-report/ar4/syr/ar4_syr.pdf***

Exponentially Increasing Rates of Temperature Change in the recent past and into the Future[2]

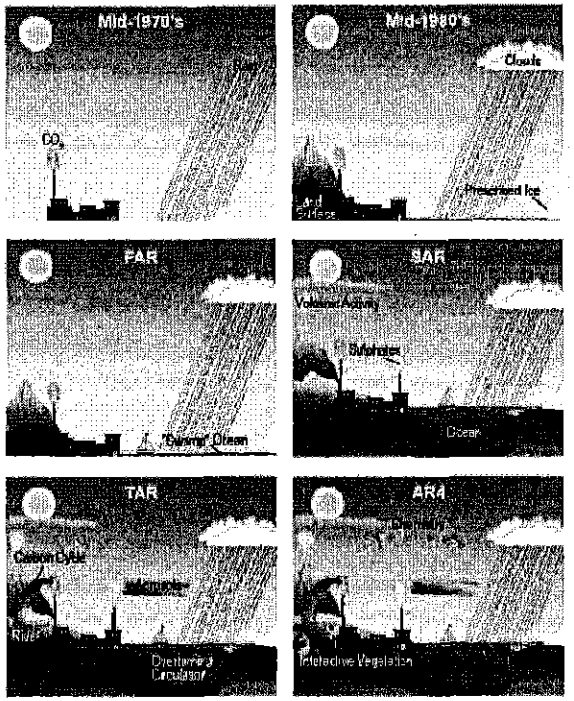


Showing different rates (slopes) of change from the same monitored temperature data set (1860-2010)

This shows that the changes are occurring more rapidly now than before and that they should also be examined on smaller and more recent time intervals in respect to City responsibilities.

[2] *From Climate Change 2007: The Physical Science Basis. Contribution of Working Group I to the Fourth Assessment Report of the IPCC [Solomon, S., D. Qin, M. Manning, Z. Chen, M. Marquis, K.B. Averyt, M. Tignor and H.L. Miller (eds.)]. Cambridge University Press, Cambridge, United Kingdom and New York, NY, US at Technical Summary 3.1 - Accessed at*http://www.ipcc.ch/publications_and_data/ar4/wg1/en/tssts-3-1-1.html

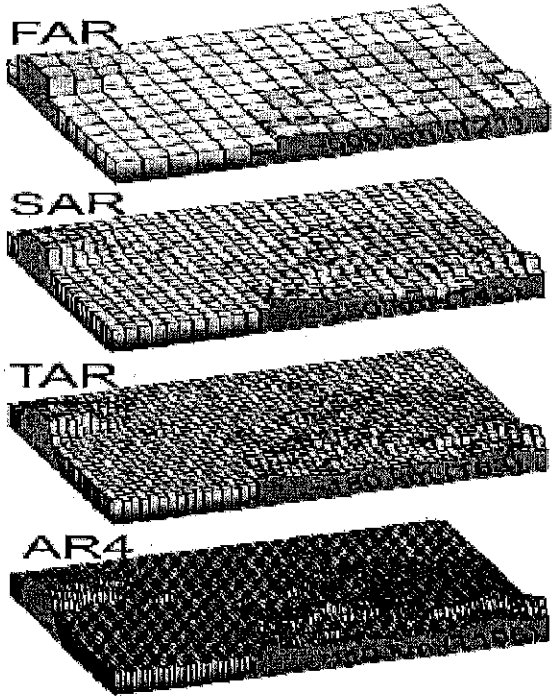
Global and Regional Climate Model Improvements (from 1970 to 2010) in Physical and Chemical Complexity[3]



More processes and better chemistry were included sequentially and created increasing certainty in the results obtained.

[3] *From Le Treut, H., R. Somerville, U. Cubasch, Y. Ding, C. Mauritzen, A. Mokssit, T. Peterson and M. Prather, 2007: Historical Overview of Climate Change. In: Climate Change 2007: The Physical Science Basis. Contribution of Working Group I to the Fourth Assessment Report of the IPCC [Solomon, S., D. Qin, M. Manning, Z. Chen, M. Marquis, K.B. Averyt, M. Tignor and H.L. Miller (eds.)]. Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA. Chapter 1.2*

Model Improvements of Geographic Scale and Three Dimensional Computational Grid Resolution (1990-2007)[4]



Scale & Resolution of IPCC Assessment Reports (AR)
FAR = 1st – 1990 SAR = 2nd - 1996
TAR = 3rd - 2001 AR4 = 4th - 2007

[4] *From Climate Change 2007: The Physical Science Basis. Contribution of Working Group I to the Fourth Assessment Report of the IPCC [Solomon, S., D. Qin, M. Manning, Z. Chen, M. Marquis, K.B. Averyt, M. Tignor and H.L. Miller (eds.)]. Cambridge University Press, Cambridge, United Kingdom and New York, NY, US at Chapter 1.5* Accessed at http://www.ipcc.ch/publications_and_data/ar4/wg1/en/ch1s1-5.html

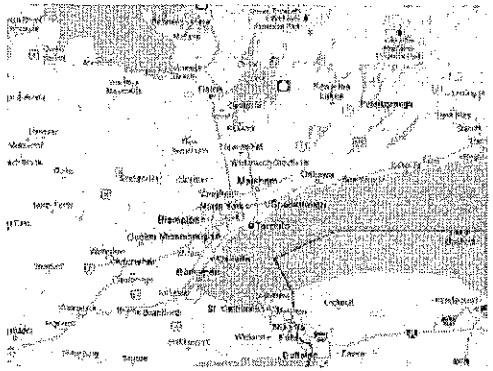
HOW DID WE APPROACH THIS STUDY?

Overcoming the limitations of global and regional climate models in understanding localized climate and weather requires a unique approach. In consultation with climatologists, meteorologists, hydrologists and climate adaptation specialists from Environment Canada, the Ontario Ministry of the Environment and Toronto Region Conservation Authority, SENES and the City of Toronto used existing Environment Canada and United Kingdom Meteorological Office - Hadley Centre results from global and regional climate models as input into a local-scale, weather forecasting research model.

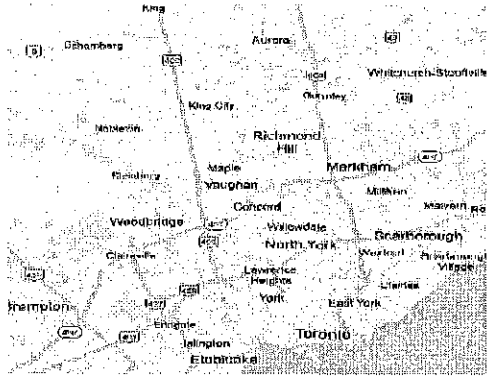
To appreciate the distinctiveness of the Toronto Climate Drivers Study approach it is necessary to understand the basics of global and regional climate models:

Global Climate Model (GCMs) - The standard approach to climate modeling has been to use global climate models linked to data of climate averages for 30 year time periods. These models operate at a course spatial resolution: a **300 km^2** grid scale. While remaining relevant to understanding climate impacts on national scale, this modelling makes no differentiation in projected future climate averages for Toronto, London, North Bay, or Muskoka due to its coarse grid scale, nor does it distinguish between lakes versus lands, or high-lands versus low-lands, or urban versus rural lands – all areas and conditions within a grid cell are described by their mean condition.

Regional Climate Model – Allows refinement of global model results by introducing Regional Climate Models (RCMs) of medium resolution (typically in the range of **40 - 100 km^2** or larger). While providing greater geographic differentiation than global models, they still do not adequately represent features such as the Great Lakes which are critical to explaining Toronto's weather and climate.

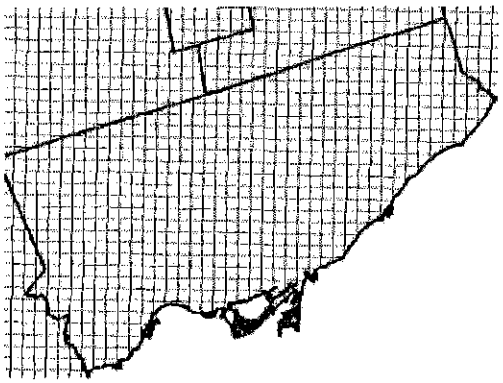


An example of a single grid cell within a Global Climate Model of 300 km x 300 km resolution.



An example of a single grid cell within a Regional Climate Model of 40 km x 40 km resolution.

These two maps show the equivalent area of one grid cell in which all weather data is considered uniform. The maps do not necessarily represent actual modelling grid cells



An example of grid cells in a Weather Research Forecast (WRF) model of 1 km x 1 km resolution used in evaluation of Toronto's future climate and weather.

Weather Research Forecasting (WRF) Model - Developed jointly by the US National Centre of Atmospheric Research, the US National Oceanic and the Atmospheric Agency this model allows the output of spatially variable mean and extreme weather predictions that account for the influence of local geography and topography.

The *Toronto's Future Weather & Climate Drivers Study* uses a sequential combination of these models. Results from global and regional models were fed into the Weather Research Forecasting (WRF) model of much finer spatial resolution to provide detailed estimates of Toronto's future local weather between **2040 and 2050** – a time horizon relevant to a large range of infrastructure replacement activities that City staff can reasonably envisage.

The result is a *climate-weather* model capable of operating at a very fine resolution (**1 km^2**). This allows different climate and weather projections to be established for even small areas within Toronto (e.g. equivalent in area to small individual postal code areas or smaller areas within Scarborough, North York or Downtown) rather than only large regional areas such as southern Ontario or even larger provinces and nations.

Having climate and weather projections physically down-scaled to this level is critical to addressing infrastructure impacts caused by extreme weather events similar to those that caused the Finch Avenue culvert collapse and road wash out of August 19 2005.

The results of the City's climate-weather model were compared against output from more traditional global and regional model combinations to verify performance. The City's results for were judged to be very good and within the range of theoretically expected results and in keeping with global and regional model output.

WHAT ARE "CLIMATE DRIVERS"?

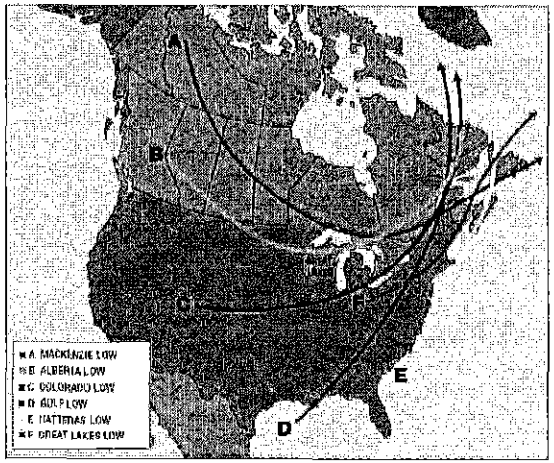
The SENES Study references "Climate Drivers" in its title (*Toronto's Future Weather & Climate Driver Study)* to reflect the significance of large scale meteorological features and processes that determine or "drive" Toronto's day-to-day weather such as the location of the Jet Stream and movement of major air masses. Climate models such as global and regional climate models can predict potential climatic changes into the future. These potential changes need to make sense and be consistent with our understanding the laws of physics and known behaviours of weather systems.

Models that run equations and provide climate data output need to make sense in light of our understanding of physical meteorological processes that we know operate in the atmosphere now. For example:

- Does the average position of the polar front jet stream move northward in keeping with the predicted average temperature changes?
- Are predictions of more intensive but fewer summer storms logically consistent with increased occurrence of updrafts of warm air?
- Does the influence of Lake Ontario and other Great Lakes continue to modify summer temperatures?
- Is a reduction in winter snowfall accompanied by a corresponding increase in winter rainfall?

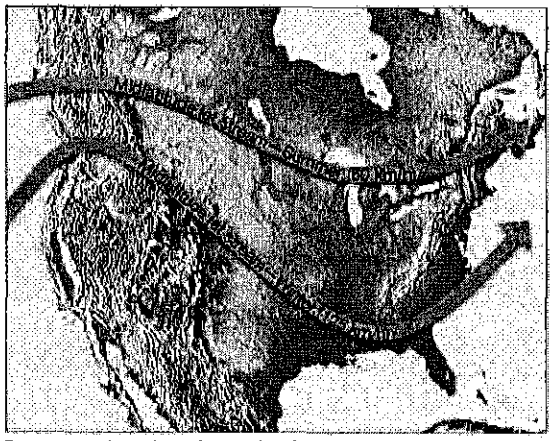
Identifying the climate drivers that control Toronto's present weather is a major part of the study and an important way to corroborate the overall integrity of model data and computer program assumption.

Common Winter Low Depressions - Sources and Storm Tracks



Source: Klok *et al.*, 2002

Summer and Winter Jet Streams



Source: University of Maryland, Department of Atmospheric and Oceanic Science (2003)

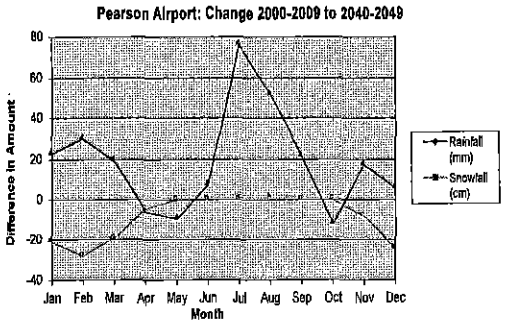
Confidence in Results using Mean Temperature as an example

Compared with Monitored Means *(2000-09)*
1) Toronto's Climate-Weather Model v.1= ***8.70°C***
2) Environment Canada's Canadian Regional Climate Model v.4.2.3 = ***6.69°C***
3) Monitored Data from Pearson = ***8.73°C***

Compared with Other Models *(2040-49) GTA Our forecast change of* ***4.4°C*** *compares favourably with Low Resolution Models showing changes from* ***-2.7°C*** *to* ***6.3°C***

Snowfall and Rainfall

- Less Snow & More Rain -- in Winter
- More Rain in July (80%) & August (50%)



SUPPORT FOR TORONTO'S APPROACH

Toronto's approach of adding output from climate models into a weather model in order to obtain more locally relevant future weather predictions was cutting edge and innovative when conceived. It has been subsequently adopted by the National Center for Atmospheric Research (NCAR) for the whole of the USA as well as by the Ontario Ministry of the Environment in partnership with the University of Toronto.

THE RESULTS FOR TORONTO

The study predicts that climate change will continue to create different weather patterns across Toronto in the future. Some changes can be regarded as being positive - longer growing season, generally more pleasant weather and fewer City resources required for winter snow clearance. However, other changes can be regarded as being negative. Though a similar number of storms per year are projected a fewer number of "heavy" storms (>25mm/day) are expected. However, a small number of those "heavy" storms" will produce "very intense" storms and produce much greater amounts of rainfall in short periods than previously seen with clear impacts on city infrastructure (culverts and drainage management) and an increased potential for flooding.

The changes (comparing 2000-2009 monitored data with modelled results for 2040-2049) **are predicted** to be as follows:

Precipitation - Snow and Rain

- Less snow and more rain in the winter
- 26 fewer snow days per year, 9 less in December
- Slightly more precipitation (snow plus rainfall) overall
- Marked rainfall increases in July (80%) and August (50%)
- Extreme rainstorm events, fewer in number but more extreme

Temperature

- Average annual temperatures increase by 4.4°C
- The projected average winter temperature increase by 5.7°C.
- The projected average summer temperature increase by 3.8°C.
- The extreme daily minimum temperature rises by 13°C (i.e., becomes less cold).

Wind

- Unchanged average wind speeds
- Reduced maximum wind speeds
- No changes in wind direction

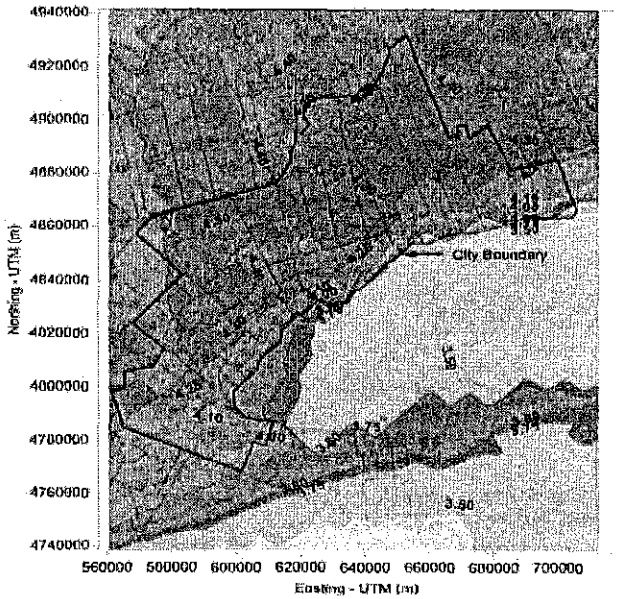
Comfort Measures

- Reduced occurrences of Wind Chill
- Virtual disappearance of Wind Chill events with temperatures below -20°C;
- Humidex events greater than 20°C increase more than 60%
- The maximum Humidex increases from 48°C to 57°C

Temperature Degree Days

- Values below 18°C can be used to estimate the heating requirements of buildings. The occurrence of such degree days are expected to reduce by almost a third - 31%
- Values above 24°C can be used to estimate the cooling requirements of buildings. The occurrence of such degree days are expected to increase by more than five times - 560% (i.e., from 32 degree-days to 180 degree days per year)

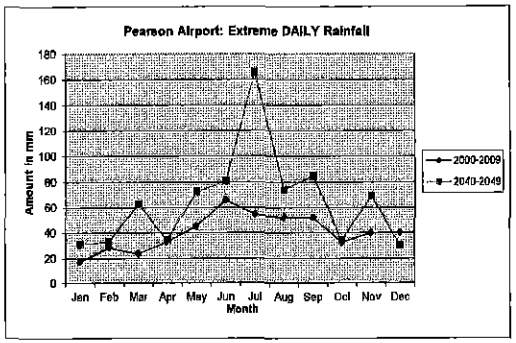
4.4°C Average Annual Temperatures Increase in Toronto



- The extreme daily maximum temperature "becomes warmer" by 7.6°C (i.e., becomes warmer).

Extreme DAILY Rainfall

- Fewer Precipitation Storms >25 mm in Winter
- Same Number of Storms in Summer
- **BUT the Summer Storms will be Much More Intense**



CHANGES IN "EXTREMES"

Most global climate models assess changes in the averages that typify a climate. The *Toronto Future Weather & Climate Drivers Study* assessed these climate averages but also extended the study to assess potential changes in the "extremes" of weather (maximums and minimums). This included examining the changing likelihood, severity and durations of "extremes" such as heat waves and intense rainstorms.

Table 2 summarizes the changes expected to occur between the period **2000-2009** and the period **2040-2049**. Key projections include:

- Though the number of storms that occur in winter decrease, the number of storms that occur in summer remains the same – but the maximum amount of rainfall expected in any single day and in any single hour more than doubles.

- The number of days when the humidex exceeds 40°C is expected to increase fourfold.

- The number of degree days >24°C (a degree-day[5] occurs when the temperature is higher than 24°C for 24 hours) - which is typically used as the measure of air conditioning being required - increases six-fold.

- The number of "heat waves" (i.e., events with more than 3 consecutive days of temperatures greater than 32°C) is expected to increase from an average of 0.57 occurrences per year, as in the period 1971-2000, to 5 occurrences per year in the period 2040-2050.

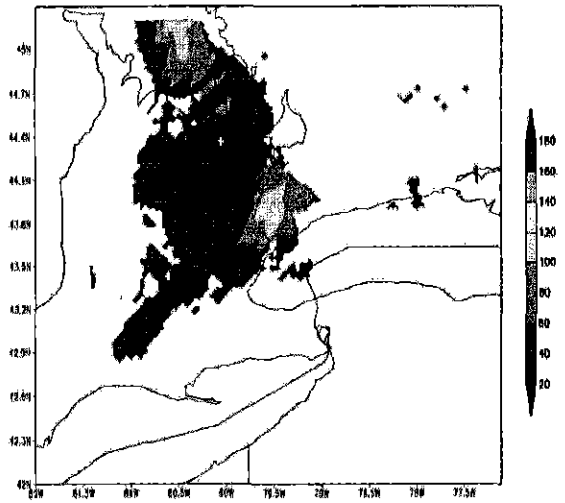
[5]For an explanation of what is meant by "degree days" please see:
http://www.oahpp.ca/resources/documents/Accumulated%20Degree%20Days.pdf

Table 2: Projected Future Weather Changes Compared to Recent Weather

Weather Type	Parameter	Units	Annual Weather **2000-2009**	Annual Weather **2040-2049**
Extreme Precipitation	Maximum Amount in One Day	mm	66	166
	Number of Days with More Than 25mm	days	19	9
	Mean Annual Daily Maximum	mm	48	86
	100 year Return Period Maximum Daily	mm	81	204
	10 year Return Period Maximum Daily	mm	62	135
	10 year Return Period Maximum Hourly	mm	20	39
Extreme Rainfall	Maximum Amount in One Day	mm	66	166
	Number of Days with More Than 25mm	days	16	9
Extreme Snowfall	Maximum Amount in One Day	cm	24	18
	Number of Days with More Than 25cm	days	16	3
Extreme Heat	Maximum Daily Temperature	°C	33	44
	Number of Days with Temperature > 30 °C	days	20	66
	Number of heat waves" (>3 consecutive days > 32°C*	events	0.57**	2.53
Extreme Cold	Minimum Daily Temperature	°C	- 17	-11
	Number of Days with Temperature < -10 °C	days	25	0
	Number of Days with Temperature < -0 °C	days	128	70
Wind Chill	Extreme Daily Wind Chill	°C eq.	-24	-17
	Number of Days with Temperatures > 20 °C	days	12	0
Degree Days	Number of Degree Days > 24 °C (A/C required)	degree-days	31	180
	Number of Degree Days > 0 °C	degree-days	3452	4587
	Number of Degree Days < 0 °C (Heat required)	degree-days	440	66
Extreme Wind	Maximum Hourly Wind Speed	km/hr	92	48
	Maximum Wind Gust Speed	km/hr	130	75
	Number of Days with Winds > 52 km/hr	days	1	0
Humidex	Maximum Humidex	°C eq.	48	57
	Number of Days with Humidex > 40 °C	days	9	39
Storms	Average Number of Storms per Year		30	23
	Average Number of Summer Storms per Year		16	17
	Average Number of Winter Storms per Year		14	6

* Note: This data is not included in SENES Report Volume I. It is included in subsequent data extraction and analysis by SENES for the City.
**Derived from Meteorological Services Canada data recorded at Toronto Pearson International Airport.

Modelling Future Extreme Storms is Much Harder.... but ....



Storm of August 19th, 2005

a) Highest Rainfall is shown over Finch Avenue

b) Captured by Modelling, but NOT by Standard Environment Canada Monitoring at Pearson International Airport (the best weather monitoring station for Toronto) because the centre of the storm was distant from the airport monitoring station.

c) Monitoring stations can only identify what happens at a particular station. Modelling can identify what happens between stations. This example typifies the benefits of not relying purely on monitored data.

THE BENEFITS OF THE FUTURE WEATHER PREDICTIONS

The study provides projections that can inform present and future infrastructure and service decisions (e.g., water pipe sizing, heat resistance of road surface materials) and policy development planning (e.g., heat wave responses, pest infestations).

By improving the level of certainty regarding the magnitude and frequency of expected climate change, and particularly extreme weather events, the City is better guided in making decisions regarding capital works investments and adjustments to operational procedures. This may reduce the risk of unsustainable investment and loss associated with infrastructure construction, maintenance and operations that do not take into account extreme weather events and climate change projections.

THE CERTAINTY OF THE FUTURE WEATHER PREDICTIONS

The study predicts potential future outcomes based on the data and the modelling capabilities of the recent past. The weather of the future will continue to change rapidly and at an accelerating rate into the future. With the passing of years the certainty surrounding the outcomes in the study will need to be reassessed and the study will need to be re-examined. The City can address this by maintaining a watching brief of:

1. The changing state of climate change science and predictions; and
2. The ongoing changes in weather extremes and means for Toronto; and
3. The significance, value and needs of timely adaptation and financing its costs.

SUMMARY AND CONCLUSIONS

Using a weather-climate model approach, this study projects the future weather changes that Toronto may expect in 2040-2049. The model combined an ensemble of large-scale global and medium-scale regional climate model data as inputs to a local scale Weather Research Forecast (WRF) model to predict successive hourly weather conditions into the future, in and around Toronto.

The study is unique as it goes beyond the standard modelling means of rainfall and temperature and assesses extremes of temperature and precipitation. On average in 2040-2049, warmer annual average temperatures of 4.4°C are expected. For seasonal averages winter temperatures are projected to increase by 5.7°C and summer temperatures by 3.8°C. Extreme daily maximum temperatures are projected to increase by 7.6°C, but extreme daily minimum temperatures are projected to also rise by 13°C (i.e., becomes less cold). Less snow and more rain in the winters (26 fewer snow days per year) and fewer rainstorm events per year are anticipated. However, the model predicts more extreme rainstorms and marked rainfall increases in July (80%+) and in August (50%+).

Considering these results as part of City Council's decision making processes may aid the City and the community better prepare and adapt to future climate change.

Future Warmer Temperatures

- Average annual temperatures increase by **4.4°C**
- Projected average winter temperature increases by **5.7°C.**
- Projected average summer temperature increases by **3.8°C.**

- The extreme daily minimum temperature - "becomes less cold" by **13°C.**
- The extreme daily maximum temperature - "becomes warmer" by **7.6°C**

Future Extreme Heat

- Mean Maximum Daily Temperature between **(2000-2009)** and **(2040-49)** changes from . . . **33°C** to **44°C**

Maximum daily air temperature is recorded at a weather station by selecting the highest 1-hourly air temperature within each 24-hour period. (Averaged here over 10 years).

- Number of days per year with temperatures greater than 30°C between **(2000-2009)** and **(2040-49)** changes from . . . **20 days** to **66 days**

Future Rain, Storms and Snowfall

Less snow, more rain in winter.
Fewer snow days per year

Fewer rainstorms per year
But more extreme rainstorms
More rainfall in July (80%+) and August (50%+)