TOWN OF HALTON HILLS
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REPORT

REPORT TO: Chair and Members of the Planning, Public Works and Transportation Committee

REPORT FROM: Gabriel Clarke, Manager of Sustainability and Climate Change

DATE: January 8th 2019

REPORT NO.: PLS-2019-0001

RE: Climate Change Adaptation Plan Update

RECOMMENDATION:

THAT Report No. PLS-2019-0001 (dated January 8, 2017) regarding the project update for the Climate Change Adaptation Plan be received.

BACKGROUND:

Action 5A of Council's 2014-2018 Strategic Action Plan calls for the "Development of a Climate Change Adaptation Plan to address community responsiveness and resiliency to climate change".

In order to fulfill this direction, Town staff have:

- Prepared and presented the Terms of Reference for the project to Council on Feb 6th 2017 as part of Report No. P&I-2017-0002;
- Participated in ICLEI Canada's the Great Lakes Climate Change Adaptation Project between the fall of 2016 and spring of 2017 to engage community stakeholders in a conversation about climate change risks and vulnerabilities facing the Town;
- Applied to and secured a $175,000.00 grant from the Federation of Canadian Municipalities' Municipalities for Climate Innovation Program (MCIP) in the first half of 2017;
- Updated the project Terms of Reference to reflect the expanded scope that the FCM grant enables in August 2017 via Report No. PLS-2017-0002;
- Issued Request for Proposal P-019-17 to hire a project consultant in the fall of 2017;

- Hired the Canadian Urban Institute as the lead project consultant in January 2018 via Report No. PLS-2018-0005;
- Initiated and completed the Town Facilities Climate Vulnerability Assessment component of the project in the spring of 2018;
- Initiated and completed the Historical Climate Analysis and Future Climate Modeling component of the project in the summer and fall of 2018; and
- Initiated the Natural Capital Assessment component of the project in the winter of 2018.

COMMENTS:

1. **Project Framework**

The framework for the development of the Climate Change Adaptation Plan is based on ICLEI Canada's Building Adaptive & Resilient Communities (BARC), but has been tailored to reflect the unique needs of Halton Hills and the additional tasks that the FCM grant enables the Town to complete. Although the BARC climate change adaptation process is structured into the five Milestones listed below, the plan development process only involves the completion of Milestones 1-3. Milestones 4 and 5 only become applicable once a climate adaptation plan has been approved by municipal Council. For a detailed description of each task and Milestone, please refer to the project Terms of Reference attached as Appendix 1 to Report No. PLS-2017-0002.

Milestone 1: Initiate
The focus of the Initiate Milestone is to set the groundwork for the remainder of the project, and involves the development of a work plan, an engagement plan and the completion of some initial research on climate change adaptation. Milestone 1 includes the following tasks:

1. Work plan
2. Engagement plan
3. Existing Town Plan Scan
4. Regional and Provincial Climate Change Policy Review

Milestone 2: Research
The goal of the Research Milestone is to produce a detailed understanding of the priority climate-related issues that need to be addressed in the Climate Change Adaptation Plan. It involves developing a climate model, assessing Town infrastructure, mapping the impacts of climate change on the Town, and engaging the community. Milestone 2 includes the following tasks:

1. Historical Climate Analysis & Future Climate Modeling
2. Community Engagement #1– Identifying Priority Climate Risks & Vulnerabilities
3. Town Facility Climate Vulnerability Assessment
4. Natural Capital Assessment

Milestone 3: Plan

Milestone 3 builds on the previous Milestones and culminates in the development of a five year climate change adaptation plan to address the priority climate change challenges facing the community. Milestone 3 includes the following tasks:

1. Community engagement #2 – Identifying Actions
2. Climate Change Plan Vision, Mission and Guiding Principles
3. Plan Document Development
4. Plan Presentation to Council

Milestone 4: Implementation

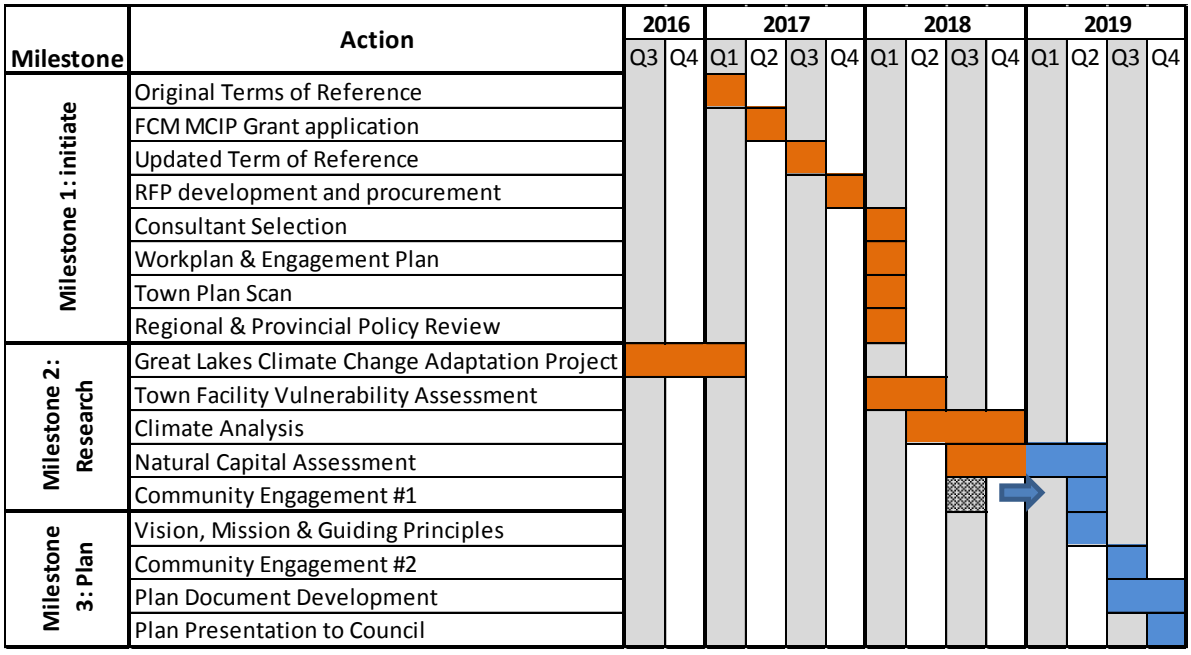
Once the plan is finalized and approved by Council the Town will initiate Milestone 4 and begin implementing actions.

Milestone 5: Monitoring and Reporting

The final project Milestone involves monitoring and reporting on the plan's implementation throughout the lifetime of the plan and establishing a process to review and keep the plan up to date.

The Gantt Chart (Figure 2) below provides an adjusted timeline of all the tasks associated with Milestones 1-3 and shows those that have been completed to date in orange and the remaining tasks in blue. Additional details regarding the status of each task are provided in the following section below.

Figure 1: Climate Change Adaptation Plan Project Timeline



2. Project Status

The development of the climate change adaptation plan is largely proceeding according to plan and is on track to be completed by the end of 2019. The tasks associated with Milestone 1 have been completed and so have the majority of the tasks associated with Milestone 2. Once those are completed staff will turn to Milestone 3. Details on the status of the tasks for each project Milestone are provided in the following tables below.

Status of Milestone 1: Completed

With the exception of the Regional and Provincial Policy Review task which will be revisited near the end of the project, Milestone 1 was completed in the second half of 2018.

Table 1: Status of Milestone 1

	Task	Status
1	Work Plan	Completed by the consultant and approved by Town staff in Q1 2018
2	Engagement Plan	Completed by the consultant in Q1 2018 and revised in Q3 2018 to reflect senior management's direction that no engagements occur in the second half of 2018 as a result of the municipal election.
3	Existing Town Plan Scan	Completed by the consultant and approved by Town Staff in Q2 2018.
4	Regional & Provincial Policy Review	Completed by the consultant and reviewed by Town staff in Q2 2018. However, the provincial policy review was completed in the first half of 2018 under the previous Liberal government and several of the climate change policies that applied at the time are not supported by the current provincial government, whose climate change policy regime is still evolving at this time. This task will be revisited at the end of the project to ensure that the results are reflective of the latest provincial developments on climate change.

Status of Milestone 2: Under Way

Milestone 2 was initiated in early 2018 with the launch of the Town Facility Vulnerability Assessment task (completed in June 2018) and is still ongoing. The Historical Climate Analysis & Future Climate Modeling Task was initially submitted to Town in July 2018, but was significantly enhanced over the following months with additional data and analysis and was completed in November 2018. The Natural Capital Assessment task was initiated in June of 2018 but has experienced a few months delay due to staff changes at the consultancy and the innovative nature of the task which involved research and the development of a custom methodology. Despite this delay, the Natural Capital Assessment task will be completed by March 2019 which will allow for the integration of the results from the assessment into community engagement events which are scheduled for April-May 2019.

Table 2: Status of Milestone 2: Research

	Task	Status
1	Historical Climate Analysis & Future Climate Modeling	Completed by the consultant and approved by Town staff in Q4 2018
2	Community Engagement #1	Scheduled for Q2 2019
3	Town Facility Climate Vulnerability Assessment	Completed by the consultant and approved by Town Staff in Q3 2018.
4	Natural Capital Assessment	Initiated by the consultant in Q3 2018. Completion expected in Q1 2019.

Status of Milestone 3:

The activities associated with Milestone 3 build on the results of the previous Milestones and will be launched in April 2019 with the development of the Vision, Mission and Guiding Principles, and will conclude in December 2019 with the Plan presentation to Council. Table 3 below shows Milestone 3 tasks and their expected timeframes.

Table 3: Status of Milestone 3: Plan

	Task	Status
1	Climate Vision, Mission & Guiding Principles	Scheduled for Q2 2019
2	Community Engagement # 2	Scheduled for Q3 2019
3	Plan Document Development	Scheduled for Q3-Q4 2019
4	Plan Presentation to Council	Scheduled for Q4 2019

3. Key Findings to Date

Town Facility Vulnerability Assessment

The objective of the Town Facility Vulnerability Task was to evaluate the ability of the Town's buildings and facilities to withstand projected changes in climate. Ten Town facilities were included in this task which was completed using the Public Infrastructure Engineering Vulnerability Committee (PIEVC) Protocol developed by Engineers Canada. The Protocol establishes the adaptive capacity of an individual infrastructure as determined by its design, operation and maintenance. It includes an estimate of the severity of climate impacts on the various components of the infrastructure (i.e. deterioration, damage or destruction) to enable the identification of higher risk components and the nature of the threat from the climate change impact. Recommendations are then made to reduce or eliminate those risks and are integrated into the Town's Asset Management program as appropriate. The Facility Vulnerability Assessment Report was not attached to this Report due to the sensitivity of the information contained therein.

Table 4 (below) shows the ten town facilities that were evaluated. The facilities are ranked from lowest risk (bottom) to highest risk of being negatively impacted by climate change.

Table 4: Evaluated Facilities and their Relative Vulnerability to Climate Change

Relative Ranking	Facility
1	Town Hall
2	Halton Hills Library & Cultural Centre (Georgetown)
3	Acton Library
4	Acton Arena
5	Mold Masters Sportsplex
6	District 3 Fire Hall (10 Side Rd.)
7	District 1 Fire Hall (Acton)
8	Robert C. Austin Operations Centre
9	Gellert Community Centre
10	District 2 Fire Hall (Maple Ave.)

Historical Climate Analysis and Future Climate Modeling:

The objective of this task is twofold: the first is to understand the nature and extent of any changes that may have occurred to the Town's climate based on measured observations to date and the second is to understand what the Town's future climate is projected to look like based on internationally-accepted and downscaled climate models.

Historical Climate Analysis

The Historical Climate Analysis was based on locally-observed climate records that were collected by Environment Canada at various points within or adjacent to Halton Hills.

Key Findings:

- Average annual temperature has risen by approximately 0.6 degrees since the 1960s.
- Total annual precipitation (all forms) has increased by 17-23mm since the 1960s.
    - Total annual snow has decreased by 11-12cm since the 1960s.
    - Total annual rain has increased by 29-34mm

Additional details on the Historical Climate Analysis can be found in the Key Climate Indicators Report for Halton Hills, attached as Appendix 1 to this Report.

Future Climate Modeling:

The Future Climate Modeling component was based on internationally-accepted greenhouse gas atmospheric concentration scenario models that were included in the

2014 Fifth Assessment Report published by the United Nations Inter-Governmental Panel on Climate Change (IPCC) and downscaled to the context of Halton Hills. Three greenhouse gas models were included in the modeling exercise to account for the uncertainty related to future global greenhouse gas emissions.

- The first so-called “Peak and Decline” model (referred to as RCP 2.6 by the IPCC) assumes that global emissions will peak between 2010 and 2020 and that the global community will make a concerted and coordinated effort to transition to a low-carbon economy. This scenario assumes the introduction of stringent global climate policies to limit and reduce emissions and, later in the century, to actually remove existing carbon dioxide from the air. The Peak and Decline scenario was included because it represents the “best case” scenario from a climate change perspective due to its limited overall climate impact.

- The second “Low Range” model (referred to as RCP4.5 by the IPCC) assumes that global greenhouse gas emissions will peak by 2040 and stabilize and decline thereafter. This model was included because it represents a “middle of the road scenario” where some action is taken to reduce greenhouse emissions, but efforts are not as ambitious compared to RCP2.6.

- The third “Business as Usual” model (referred to a RCP 8.5 by the IPCC) assumes that little or no concerted effort will be made by the global community to reduce greenhouse gas emissions and that annual global greenhouse gas emissions will continue to increase throughout this century. The Business as Usual scenario was included because it exemplifies the “worst case” scenario from a climate change perspective due to the extensive nature of the climate impacts it projects and because it represents the world’s current emissions trajectory.

Each of the three climate scenarios were then projected to the year 2100 and the results were analyzed for three periods of time:
- The “2020s” which includes the years 2011-2040;
- The “2050s” which includes the years 2041-2070; and
- The “2080s” which includes the years 2071-2100.

<u>Key Findings: Temperature</u>

- Halton Hills’ annual average temperature for is projected to increase by another 1.4 degrees C under RCP2.6, 3.6 degrees C under RCP 4.5 and 6 degrees C under the business as usual scenario by the year 2100 (see Figure 2).
- Building heating loads in Halton Hills are projected to decrease by 21% under RCP2.6, 32% under RCP4.5 and 47% under RCP 8.5 by 2100 (see Figure 3).
- Building cooling loads in Halton Hills are projected to increase by 100% under RCP2.6, 172% under RCP 4.5 and by 356% under the business as usual scenario by 2100 (see Figure 4).

Figure 2: Projected Annual Average Temperature

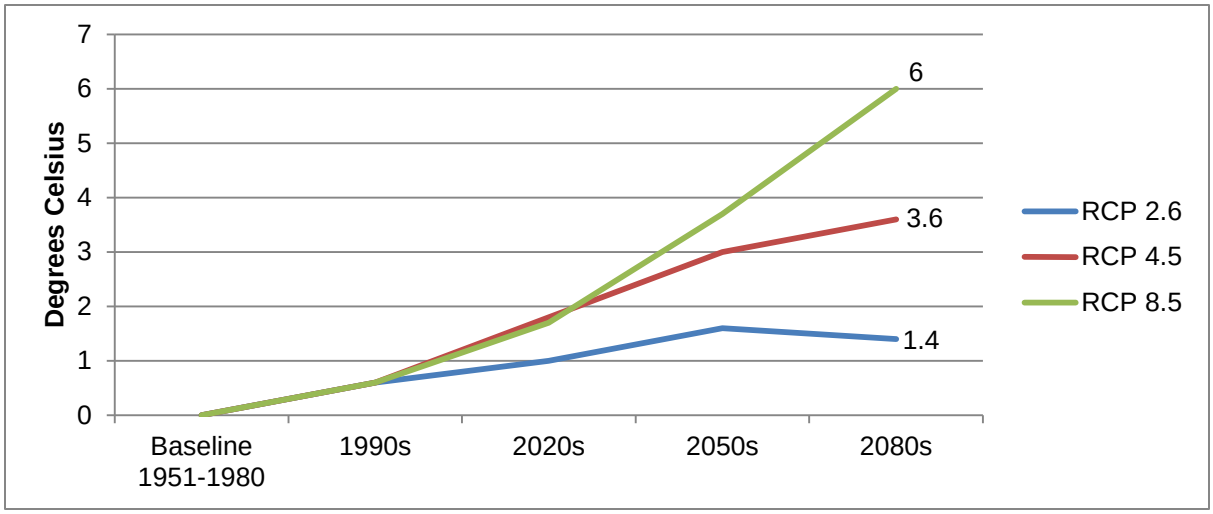


Figure 3: Projected Annual Building Heating Loads

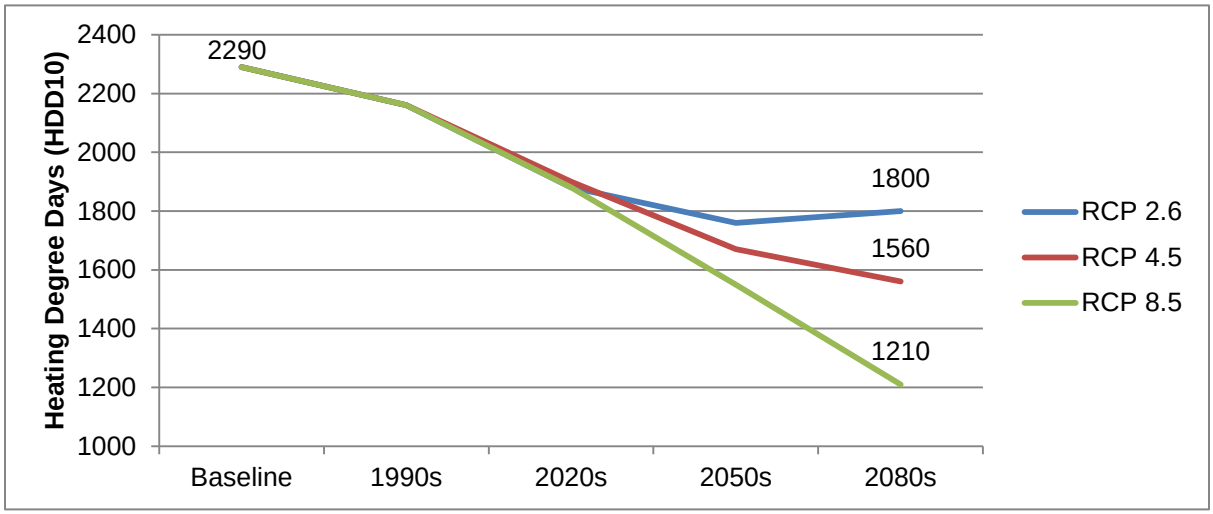
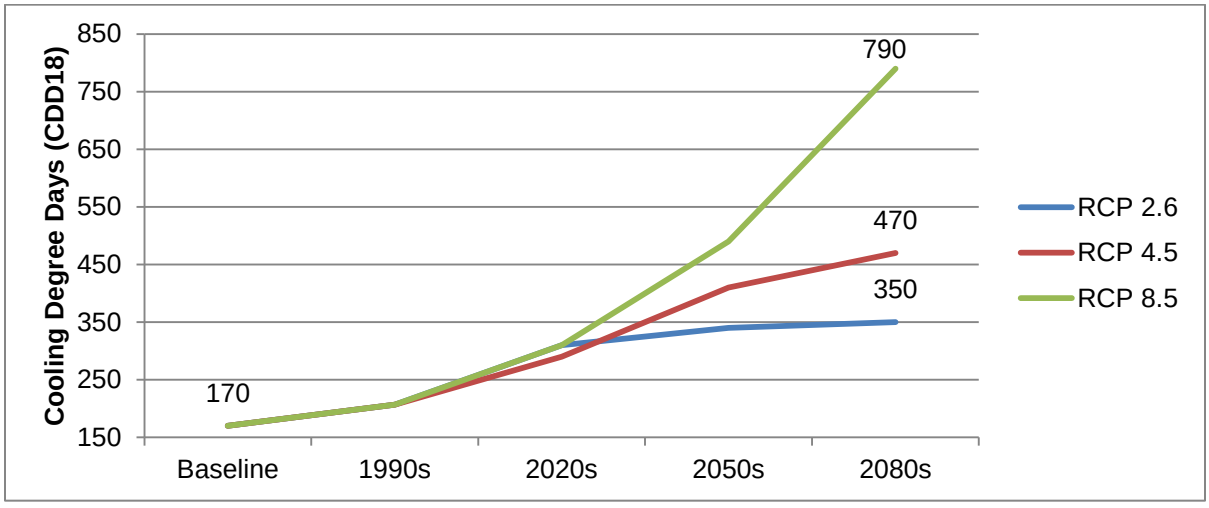


Figure 2: Projected Annual Building Cooling Loads



Key Findings: Precipitation

- Total annual precipitation is projected to increase by another 93mm under RCP2.6, 92mm under RCP4.5 and 142mm under the Business as Usual scenario by 2100.
- Total annual snowfall is projected to decrease by another 32cm under RCP2.6, 49 cm under RCP 4.5 and by 77cm under the Business as Usual scenario by 2100.
- Total annual rainfall is projected to increase by 125mm under RCP2.6, 141 mm under RCP4.5 and by 219mm under the Business as Usual scenario.
- Spring and winter rainfall volumes are projected to increase substantively under all scenarios while summer rain volume is projected to decrease marginally.

RELATIONSHIP TO STRATEGIC PLAN:

Action 5A of Council's 2014-2018 Strategic Action Plan calls for the development of a Climate Change Adaptation Plan to address community responsiveness and resiliency to climate change.

This Report provides a progress update in fulfilling action 5A.

FINANCIAL IMPACT:

There are no financial impacts associated with this Report.

CONSULTATION:

N/A

PUBLIC ENGAGEMENT:

Findings from the Climate Analysis and a selection of findings from the Facility Vulnerability Assessment will be made available online and integrated into the future community engagements as appropriate. The full Climate Analysis Report will be made available on the Let's Talk Halton Hills engagement platform.

SUSTAINABILITY IMPLICATIONS:

The Town is committed to implementing our Community Sustainability Strategy, Imagine Halton Hills. Doing so will lead to a higher quality of life.

Through the identification of climate related risks and the development of strategies to minimize/address those risks, the Climate Change Adaptation Plan will enhance the Town's ability to "be prepared for climate change" and advances the Strategy's implementation.

This Report supports the environmental pillar of Sustainability and in summary the alignment of this report with the Community Sustainability Strategy is Excellent.

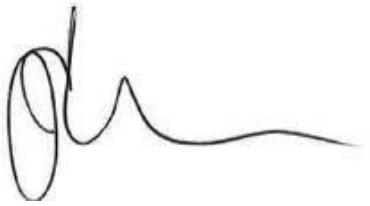
COMMUNICATIONS:

The existence of the Climate Analysis Report will be communicated to the community through the Town's Sustainability Newsletter, the Let's Talk Halton Hills platform and through social media along with an invitation to provide feedback through the Town's engagement platform and/or at upcoming in-person engagement events associated with this project.

CONCLUSION:

The development of a Climate Change Adaptation Plan is a key strategic priority for Halton Hills. This Report discusses the progress made to date, outlines notable results from the Facility Vulnerability Assessment and Historical Climate Analysis & Future Climate Modeling tasks and provides a roadmap for completing this important project.

Reviewed and Approved by,



John Linhardt, Commissioner of Planning and Sustainability

Brent Marshall, CAO