ADOPTED by Council at its meeting held January 23, 2012 **[M29-2012]**
/AA
Windsor, Ontario January 23, 2012

REPORT NO. 35 of the
ENVIRONMENT & TRANSPORTATION STANDING COMMITTEE
of its meeting held November 23, 2011

Present:

Councillor Hatfield, Chair
Councillor Payne
Councillor Sleiman
Councillor Halberstadt
Councillor Valentinis

That the following recommendations of the Environment and Transportation Standing Committee **BE APPROVED:**

Moved by Councillor Sleiman, seconded by Councillor Valentinis,

That City Council **APPROVE** the development of a Corporate-wide climate change action plan with a focus on impacts with a medium-high risk or above, as outlined in Milestone Three of the ICLEI climate change adaptation initiative; and

That City Council **APPROVE** the concurrent development of a comprehensive storm water management strategy as a first step to addressing the potential impacts related to storm water.

Carried.

Livelink 15549, EI/10822

Clerk's Note: The report entitled "Update on the Climate Change Adaptation Initiative – Milestone 2" dated October 28, 2011 is ***attached*** as background information.

CHAIRPERSON

DEPUTY CLERK

NOTIFICATION:				
Name	Address	Email Address	Telephone	FAX

THE CORPORATION OF THE CITY OF WINDSOR
Environment & Transportation Standing Committee - Administrative Report

MISSION STATEMENT:
"The City of Windsor, with the involvement of its citizens, will deliver effective and responsive municipal services, and will mobilize innovative community partnerships"

LiveLink REPORT #: 15549 EI/10822	**Report Date: October 28, 2011** (#3182 j-lr-11/07/11:ebr)
Author's Name: Karina Richters	**Date to Standing Committee: November 23, 2011**
Author's Phone: 519 253 7111 ext. 226	**Classification #:**
Author's E-mail: krichters@city.windsor.on.ca	

To: **Environment & Transportation Standing Committee**

Subject: **Update on the Climate Change Adaptation Initiative – Milestone 2**

1. RECOMMENDATION:

City Wide: X Ward(s): _____

1. That City Council **APPROVE** the development of a Corporate-wide climate change action plan with a focus on impacts with a medium-high risk or above, as outlined in Milestone Three of the ICLEI climate change adaptation initiative; and

2. That City Council **APPROVE** the concurrent development of a comprehensive storm water management strategy as a first step to addressing the potential impacts related to storm water.

EXECUTIVE SUMMARY: N/A

2. BACKGROUND:

In November 2010, City Council approved the participation in the ICLEI Canada Adaptation Initiative. The development of the ICLEI initiative was sponsored by National Resources Canada's Climate Change Impacts and Adaptation Division.

This initiative provides a straightforward methodology to adaptation planning using a five-milestone approach. The five milestones are as follows:

- Milestone One – Initiate
- Milestone Two – Research
- Milestone Three – Plan
- Milestone Four – Implement and
- Milestone Five – Monitor

Milestone One was completed with an update report to Environment & Transportation Standing Committee in June 2011 (Livelink Report #15308).

3. DISCUSSION:

The objectives of Milestone Two was to conduct research into climatic changes and their potential impacts and how those potential impacts would affect the City of Windsor's services, operations as well as the community as a whole.

Next was an assessment of the existing vulnerability of a service area to respond to the impacts noted, followed by the likelihood and risk consequences of not preparing for the noted potential impacts.

In order to best understand how the projected climatic changes will impact the various departments, workshops were set up with all internal departments and some outside agencies. A total of 12 workshops were scheduled. These workshops began with a 20 minute presentation on the ICLEI initiative and the projected climatic changes with reference to historical climate data. After the presentation, the departments were asked to consider how these projections could impact their respective areas and the community.

REFINING IMPACTS

Departments were asked to brainstorm on potential impacts of climate change. During the workshops, it was emphasized that climate change may have negative impacts that need to be planned for, but that it is also important that departments consider the positive impacts and opportunities that may be associated with the projected changes.

Each workshop generated anywhere from 20 to 50 potential impacts. As expected, many potential impacts were repeated in various workshops. A compilation resulted in over 250 noted potential impacts.

Due to time constraints, the departments were asked to look at all potential impacts and determine two to four of the potential impacts that would be the most important to the departments. Then the vulnerability and risk assessment tools provided through this initiative were completed for those potential impacts.

VULNERABILITY ASSESSMENTS

Vulnerability is a function of a service area's sensitivity to climate change and its capacity to adapt to climate change impacts (or adaptive capacity).

In determining a service area's sensitivity to the projected changes in climate, the following questions were considered:

1. How exposed is the service area to the impacts of climate change?
2. Is the service area subject to any existing stresses (i.e. budgetary restrictions, legislative requirements, staffing resources etc)?
3. Will climate change cause the demand for a resource or service to exceed its supply or current abilities?
4. If the impact occurs, will it affect the functionality of the service area?

Based on the response to the last question, the service area was given a sensitivity rating for that impact.

The next step in the vulnerability assessment was to determine the adaptive capacity for each department to respond to the noted potential impact. Adaptive capacity describes the ability of built, natural and human systems to accommodate changes in climate with minimum disruption or additional costs. In measuring the adaptive capacity, departments considered how the projected impacts would affect their operations and whether the department can adapt to those changes.

The adaptive capacity rating is directly related to the department's projections for costs and staff intervention to adjust to the projected impact. If a department requires substantial costs and staff intervention to adjust to the impact, their adaptive capacity is low, contrary if a department can address the projected impact with little to no extra resources, their adaptive capacity is higher.

With both the sensitivity and adaptive capacity assessments complete, a vulnerability score is given for that department in relation to that projected impact. Those departments with high sensitivity and low adaptive capacity are highly vulnerable; on the other hand, those with low sensitivity and high adaptive capacity have low vulnerability. The sensitivity and adaptive capacity matrix for determining vulnerability levels is provided in Appendix A attached.

RISK ASSESSMENT

Risk is the combination of an event's likelihood and the severity of its consequences – risk therefore equals the probability of projected impact multiplied by the consequence severity of that event.

Before determining the likelihood, the potential impact was noted as either a one-time occurrence or something that will reoccur, in the event of climate change. On the assumption that climate change would occur to a significant degree, most of the potential impacts selected by the various departments were impacts that would likely reoccur. Potential impacts that, in the event of significant climate change were almost certain to occur or could occur several times per year, were given a score of 5, while impacts that were unlikely to occur in the next 25 years received a score of 1.

The next step in the initiative was to determine a consequence rating. This includes known or estimated consequences to public safety, local economy and growth, community and lifestyle, environment and sustainability and public administration if the potential impact was to occur without further planning to mitigate the impact.

For each of the five criteria noted, the departments were asked to select appropriate consequence ratings. If a given impact is likely to have a catastrophic consequence rating, it will score a 5 for that criteria and if the impact will cause negligible damage to the criteria, it receives a score of 1. The scores received for each criteria are added together to get an overall consequence rating score.

As noted above, the likelihood and the consequence score are multiplied together to determine the risk score or degree of risk.

The ICLEI initiative interprets the risks levels, broadly speaking, as follows:

- **Extreme** risks demand urgent attention at the most senior level and cannot be simply accepted as a part of routine operations without executive sanction.
- **High** risks are the most severe that can be accepted as part of routine operations without executive sanction but they will be the responsibility of the most senior operational management and reported upon at the executive level.
- **Medium** risks can be expected to form part of routine operations but they will be explicitly assigned to relevant managers for actions, maintained under review and reported upon at senior management levels.
- **Low** risks will be maintained under review but it is expected that existing controls will be sufficient and no further action will be required to treat them unless they become more severe.

RESULTS

As noted above, the departments each selected a few impacts to carry through the vulnerability and risk assessment tools. Many of the potential impacts were repeated or related. None of the potential impacts identified received an extreme rating. The table below summarizes the potential impacts with the associated degree of risk.

Table 1: Summary of Climate Change Impacts with Associated Risk

Climate Change	Potential Climate Change Impact	Degree of Risk
All climatic changes	Development policies created in the absence of Climate Change considerations	Very High
All climatic changes	Increase in operating/maintenance demands to deal with climate extremes	High
Increase in frequency of extreme weather events	Increased chance of flooding	High / Medium High
Increase in frequency of extreme weather events	An increase in demand to all areas of Operations to respond to a severe storm (during and after)	Medium - High
Increase in summer temperatures	Increase in health risks due to extreme heat for the public	Medium-High / Medium Low
Increase in winter temperatures	An increase in the number of freeze/thaw cycles may accelerate the deterioration of the roads	Medium
Increase in average annual temperatures	Increased demand for active transportation options	Medium
All climatic changes	An increased need for employee protection due to extreme weather	Medium
Increase in frequency of extreme weather events	Increased peak flows for utilities, chemicals	Medium
Increase in summer temperatures	More rapid deterioration of infrastructure due to increased temperature impacts on construction material	Medium – Low
Increase in annual precipitation	Increased demand for utilities, chemicals, etc., to treat increased flows	Medium – Low
Increase in frequency of extreme weather events	Increased incidents of storm-related damage	Medium – Low
Increase in frequency of extreme weather events	Increased number of extreme events requiring immediate municipal intervention at senior administration level	Medium - Low

With the completion of Milestone Two, the City of Windsor has;

1) A comprehensive understanding of climate changes and potential impacts for the community,
2) A list of potential impacts and the primary service area with additional stakeholders
3) A vulnerability assessment
4) A risk assessment
5) A prioritized list of impacts – based on vulnerability and risk assessment.

MILESTONE THREE – PLAN

Milestone Three will help the City of Windsor establish a vision, goals and objectives for the community's adaptation effort. In addition, the potential impacts identified in Milestone Two, along with the results of the vulnerability and risk assessment, will be used to help prioritize the impacts requiring further investigation and planning.

The plan will focus on those impacts rated medium-high and above, but may consider other impacts noted especially where co-benefits (mitigation and adaptation) exist or for impacts that may be easily addressed through this process. The plan will summarize a list of short and long term actions that will be developed to address significant impacts. There will be an examination of the constraints and drivers which may affect the ability to implement actions, as well as the financial aspects of these actions.

Finally, using all this information, a climate change adaptation action plan will be developed.

In addition to the corporate wide climate change adaptation plan, one issue that kept arising throughout many of the departmental meetings was impacts relating to storm water. The climate change projections indicate over a five percent increase in average annual precipitation by 2050, with an increase of five percent per decade increase in the number of extreme rain events over the same period.

This information is causing concern for many departments. Nine of the potential impacts selected by the departments for completion of the vulnerability and risk assessment relate to storm water issues (i.e. basement flooding, infrastructure, storm water treatment etc).

Therefore, administration is recommending the concurrent development of a strategy to address storm water impacts. The development of this strategy will require creating a storm water working group including staff from Operations, Engineering, ERCA, Planning and Pollution Control.

The working group will look at the current initiatives the City has taken to address storm water, and will explore additional ways to reduce the impacts of increased precipitation starting at the property level, sewer systems, flood plains and waste water treatment facilities.

Best Management Practices currently being used in other municipalities will be investigated. Through this process, the working group will determine whether there are strategies, beyond what has already been implemented, to prepare for the predicted increase in storm water. Depending on the results, a detailed strategy outlining timelines and estimated costs will be brought back to council for consideration.

Currently, the Public Works department already has funds in the 2014 and 2015 Capital Budgets for storm and sanitary sewer master plans, respectively.

Administration is currently working with Health Canada to extend the Memorandum of Agreement (MOA) for the Heat Alert and Response Plan. The original MOA was signed in 2009. This extension of the MOA will provide the City of Windsor with additional resources to enhance the Stay Cool Windsor-Essex Campaign as well as resources to look at local options to mitigate the urban heat island effect, both of which will reduce the risks associated with some of the potential impacts noted in the ICLEI initiative.

A report to City Council on this MOA extension is expected before the end of the year.

4. FINANCIAL MATTERS:

The total cost of $24,000 associated with participation in the ICLEI two-year initiative has already been paid in full as approved through CR408/2010.

The development of the corporate wide climate change action plan and the comprehensive storm water management strategy will be completed internally with existing funds provided in the Environmental Master Plan budget.

There is currently $9,500 outlined for Special Projects (Climate Change Adaptation Initiative) within the 2011 Environmental Master Plan Budget to assist the working groups with resources or costs required to draft the plans. A portion of these funds will be used towards public consultation.

The development of both plans will include the highlighting of priority actions with anticipated costs and timelines. The financial costs associated with the adaptation strategies will be estimated through the planning process. All opportunities for co-benefits (mitigations and adaptation), cost sharing and any available grants will be investigated to manage costs. Actions determined to require additional funding will be reported to council at a later date.

Both plans will be brought back to council for approval.

5. CONSULTATIONS:

- Climate Change Adaptation Team including; Planning, Engineering, Office of Continuous Improvement, Finance, Essex Region Conservation Authority, Windsor Utilities Commission.
- Various staff representing the departments
- Windsor Essex County Health Unit
- Supervisor of Risk Management

6. CONCLUSION:

The completion of Milestone Two has provided the opportunity to look at how the projected climatic changes will impact the services provided by the City of Windsor or the community. The climate change adaptation initiative is now entering Milestone Three, where the City of Windsor will develop a climate change adaptation plan.

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Economic Development and Public Safety

/jlr:ebr

APPENDICES:
Appendix A: Sensitivity and Adaptive Capacity Matrix for Determining Vulnerability Level

DEPARTMENTS/OTHERS CONSULTED:
Name:
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Name	Address	Email Address	Telephone	FAX

APPENDIX A

Sensitivity and Adaptive Capacity Matrix for Determining Vulnerability Level

SENSITIVITY AND ADAPTIVE CAPACITY MATRIX FOR DETERMINING VULNERABILITY LEVEL

V1 = Low Vulnerability
V2 = Medium-Low Vulnerability
V3 = Medium Vulnerability
V4 = Medium-High Vulnerability
V5 = High Vulnerability

		Sensitivity: Low → High				
		S1	S2	S3	S4	S5
Adaptive Capacity Low ↓ High	AC1	V2	V2	V4	V5	V5
	AC2	V2	V2	V3	V4	V5
	AC3	V2	V2	V3	V4	V4
	AC4	V1	V2	V2	V3	V4
	AC5	V1	V1	V2	V3	V3