



**PUBLIC AGENDA  
SASKATOON ENVIRONMENTAL  
ADVISORY COMMITTEE**

**Thursday, January 12, 2017, 11:30 a.m.  
Committee Room A, Second Floor, City Hall  
Committee Members:**

**Ms. K. Aikens  
Ms. A. Bugg  
Ms. K. Engele-Carter  
Ms. A. Garg  
Councillor S. Gersher  
Ms. S. Harrison  
Mr. S. Homenick  
Dr. D. McGrane  
Ms. K. Palmer  
Mr. B. Sawatzky**

**Pages**

**1. CALL TO ORDER**

**1.1 Appointment of Chair and Vice-Chair [CK. 175-9]**

The Committee is requested to appoint a Chair and Vice-Chair for 2017. Ms. Kathleen Aikens was Chair and Mr. Brian Sawatzky was Vice-Chair for 2016.

**Recommendation**

That the Saskatoon Environmental Advisory Committee appoint a Chair and Vice-Chair for 2017.

**1.1.1 2017 Membership - Saskatoon Environmental Advisory Committee [CK. 175-9]**

City Council, at its meeting held on December 12, 2016, adopted a recommendation of its Governance and Priorities Committee that the following be appointed and reappointed to the Saskatoon Environmental Advisory Committee for 2017:

- Ms. Kathleen Aikens, Public Representative
- Ms. Angie Bugg, Public Representative
- Ms. Kari Engele-Carter, Saskatoon Health Region
- Ms. Aditi Garg, Public Representative

- Councillor Sarina Gersher
- Ms. Sara Harrison, Public Representative
- Mr. Sean Homenick, Public Representative
- Dr. David McGrane, Public Representative
- Ms. Kathryn Palmer, Public Representative
- Mr. Brian Sawatzky, Public Representative

**Recommendation**

That the information be received.

**2. CONFIRMATION OF AGENDA**

**Recommendation**

That the agenda be confirmed as presented.

**3. ADOPTION OF MINUTES**

**Recommendation**

That the minutes of Regular Meeting of the Saskatoon Environmental Advisory Committee held on November 10, 2016 be approved.

**4. UNFINISHED BUSINESS**

**5. 2017 MEETING DATES [CK. 175-9]**

The following is a proposed schedule of meeting dates for 2017 (no meetings in July, August, and December):

- January 12
- February 9
- March 9
- April 13
- May 11
- June 8
- September 14
- October 12
- November 9

**Recommendation**

That the meeting dates for the Saskatoon Environmental Advisory Committee for 2017 be approved.

**6. REPORT OF THE CHAIR [CK. 175-9]**

**7. COMMUNICATIONS**

## 8. REPORTS FROM ADMINISTRATION

### 8.1 Environmental & Corporate Initiatives [CK. 7550-1]

*Verbal Update - B. Wallace*

#### **Recommendation**

That the information be received.

### 8.2 Saskatoon Greenhouse Gas Inventory and Update on Compact Mayors [CK. 7542-004]

6 - 18

*Verbal Update - Nasha Spence, Environmental & Corporate Initiatives*

A PowerPoint presentation will be provided.

Attached is a report of the General Manager, Corporate Performance, dated December 6, 2016, which was considered at the Regular Business Meeting of City Council held on December 12, 2016; it was resolved, in part, that SEAC be asked to assist in developing a Community Greenhouse Gas Reduction Target.

#### **Recommendation**

That the Committee provide direction.

### 8.3 Aquatic Invasive Species: Response to PARCS [CK. 277-1, x 7550-1]

19 - 29

Attached is a report of the General Manager, Corporate Performance, dated November 14, 2016, which was considered at the Standing Policy Committee on Environment, Utilities & Corporate Services Meeting held on November 14, 2016; it was resolved, in part, that the report be referred to SEAC to review and report back with input to the Standing Policy Committee on Environment, Utilities & Corporate Services.

#### **Recommendation**

That the Committee provide direction.

### 8.4 2016 Update to Our Environment: The City of Saskatoon's Environmental Leadership Report [CK. 7550-1, x 430-78]

30 - 70

Attached is a report of the General Manager, Corporate Performance, dated December 6, 2016, which was considered at the Regular Business Meeting of City Council held on December 12, 2016; it was resolved, in part, that the report be forwarded to SEAC for its information.

#### **Recommendation**

That the information be received.

**8.5 Environmental Sustainability Plan [CK. 7550-1, x 7540-002] 71 - 79**

Attached is a report of the General Manager, Corporate Performance, dated December 6, 2016, which was considered at the Regular Business Meeting of City Council held on December 12, 2016; it was resolved, in part, that the report be forwarded to SEAC for its information.

**Recommendation**

That the information be received.

**8.6 Environmental Protection Annual Report 2015 [CK. 430-78, x 7550-1] 80 - 110**

Attached is a report of the General Manager, Corporate Performance, dated December 6, 2016, which was considered at the Standing Policy Committee on Environment, Utilities & Corporate Services Meeting held on December 6, 2016; it was resolved, in part, that the report be forwarded to SEAC for its information.

**Recommendation**

That the information be received.

**8.7 Ecological Footprint Report 2014 [CK. 7550-1] 111 - 141**

Attached is a report of the General Manager, Corporate Performance, dated December 6, 2016, which was considered at the Standing Policy Committee on Environment, Utilities & Corporate Services Meeting held on December 6, 2016; it was resolved, in part, that the report be forwarded to SEAC for its information.

**Recommendation**

That the information be received.

**9. GREENHOUSE GAS EMISSIONS SUBCOMMITTEE - UPDATE [CK. 375-4]**

*Verbal Update* - regarding the progress on the social media campaign pertaining to climate change.

**Recommendation**

That the Committee provide direction.

**10. APPOINTMENT OF SASKTOON ENVIRONMENTAL ADVISORY COMMITTEE REPRESENTATIVE ASSISTANCE TO COMMUNITY GROUPS - CASH GRANTS PROGRAM ENVIRONMENTAL COMPONENT [CK. 1871-1]**

This matter is on the agenda to determine the Saskatoon Environmental Advisory Committee representative for 2017. The Committee has been asked by the Environmental & Corporate Initiatives Division to select a representative to

serve on the evaluations for the Environmental component of the Community Cash Grants Program.

Ms. Angie Bugg was appointed as the Saskatoon Environmental Advisory representative for 2016.

**Recommendation**

That the Committee appoint a Saskatoon Environmental Advisory representative for 2017.

**11. 2016 ANNUAL REPORT - SASKATOON ENVIRONMENTAL ADVISORY COMMITTEE [CK. 175-9]**

This matter is on the agenda to determine the writer for the 2016 Annual Report.

**Recommendation**

That the Committee provide direction.

**12. STATEMENT OF EXPENDITURES [CK. 1704-5]**

142 - 142

Attached is the year-end Statement of Expenditures. The 2017 approved budget is \$6,800.

**Recommendation**

1. That the information be received; and
2. That the Committee allocate its line items for 2017.

**13. PUBLICATIONS [CK. 175-9]**

*Planning and Design Newsletter, Fall/Winter 2016 edition.*

Hardcopies of the publication will be distributed at the meeting.

**Recommendation**

That the information be received.

**14. ADJOURNMENT**

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## Saskatoon Greenhouse Gas Inventory and Update on Compact of Mayors

### Recommendation

That a report be submitted to the Standing Policy Committee on Environment, Utilities and Corporate Services recommending:

1. That the Saskatoon Environmental Advisory Committee be asked to assist in developing a Community Greenhouse Gas Reduction Target;
3. That the Administration bring forward a report on an inclusive strategy for reducing greenhouse gas emissions in the community; and
2. That the City of Saskatoon apply for membership in the International Council for Local Environmental Initiatives, including appointing a Sponsor from City Council.

### Topic and Purpose

The purpose of this report is to table and summarize the 2014 Greenhouse Gas Emissions for the City of Saskatoon (City), and to demonstrate completion of the first requirement under the Compact of Mayors. The implications of the federal government's announcement regarding implementing a price for carbon in 2018 is also described.

### Report Highlights

1. Overall emissions in Saskatoon are on the rise. Emissions in the community increased approximately 12% between 2003 and 2014 while the City's corporate emissions rose 39%.
2. Now that the Inventory is complete, Saskatoon's next commitments under the Compact of Mayors includes setting emissions targets and developing a plan for reducing emissions in both the community and for the corporation.
3. The federal government has announced that carbon will be subject to a pricing model in 2018.

### Strategic Goals

The recommendation in this report supports the priority to implement the Energy and Greenhouse Gas Reduction Plan under the Strategic Goal of Environmental Leadership.

### Background

An Emissions inventory was last completed for the City for the 2003 year. This provided a platform for an Energy and Greenhouse Gas Management plan completed in 2009, which outlined six Energy and Emissions Management goals.

In 2015, the Saskatoon Environmental Advisory Committee recommended that the City complete a greenhouse gas emissions inventory. The Saskatchewan Environmental

Society also submitted a letter to City Council that listed 21 recommendations for reducing emissions in Saskatoon with the first step being the completion of a community emissions inventory. In November 2015, the City became a signatory to the Compact of Mayors, committing to address climate change by reducing greenhouse gas emissions. The 2014 Saskatoon Greenhouse Gas Emissions Inventory is the first step in complying with the Compact of Mayors.

## **Report**

### Results of Emissions Inventory

Based on availability of data from external sources, the Administration completed the 2014 inventory of gas emissions. Due to the amount of data involved in this inventory, a report is only completed periodically. As highlighted in the complete Inventory report (available on the City's web-site), the overall measure of greenhouse gas emissions in Saskatoon for 2014 from all sectors was 3,852 kilotons of carbon dioxide equivalents (CO<sub>2e</sub>). This is an increase of 12.6% from the prior inventory completed in 2003. Additional sectors were analyzed to complete the 2014 inventory, accounting for 5% of emissions. The population increase from 2003 to 2014 was 26%. The acres of land developed in suburban areas reached 883.12 acres in 2014, an increase of 27% since 2010. Growth in housing units was 18%.

Within the community, the largest emissions produced are from energy consumed in residential dwellings and business buildings, which constitutes 24% and 34% respectively. Transportation is the second highest emissions sector in the city at 31% overall. This sector includes vehicle emissions from personal vehicles and business use, public transportation, air travel, rail travel and marine. Attachment 1 summarizes the total emissions for each sector analyzed for the 2014 community emissions inventory.

The City of Saskatoon as a corporation realized an increase of emissions since the 2003 inventory of 39% at 106 kilotons of CO<sub>2e</sub>. Buildings are the largest emitters at 44% of the total corporate emissions. The 2014 emissions inventory analyzed additional sources than those reported in the 2003 inventory. If the additional sectors are eliminated, the emissions per sector are very similar between 2003 and 2014. Attachment 2 summarizes the emissions produced by the corporation.

### Next Steps Under the Compact of Mayors

To be environmentally sustainable, a corporation must operate in a manner that mitigates or reduces emissions and adapts to climate change, such as creating infrastructure that could withstand a flash flood. The City demonstrated a commitment to environmental sustainability by signing the Compact of Mayors, a joint voluntary agreement launched at the 2014 United Nations Summit on Climate Action and initiated by C40 and ICLEI – Local Governments for Sustainability. Under the Compact, the City is required to report on climate change mitigation and adaptation. The 2014 Saskatoon Greenhouse Gas Emissions Inventory is the first of four phases the City is required to deliver. Prior to 2018, compliance requires the City to set and report on targets to reduce emissions and to create a model to reach these targets. The Compact of Mayors requires adaptation milestones to be met simultaneously, which is currently

being delivered and reported. An update on adaptation will be provided in the first quarter of 2017. Detail on the timelines and reporting requirements are summarized in Attachment 3.

The Saskatoon Environmental Advisory Committee (SEAC) has demonstrated interest and expertise in the area of greenhouse gas emissions. The Administration recommends that SEAC be asked to assist in developing a Community Greenhouse Gas Reduction Target and that this target form the basis for engaging stakeholders and the community on strategies for reducing emissions.

#### Developing a Strategy to Reduce Emissions

A 30% reduction target for the corporation was set by the City in 2013, to be realized by 2023 from 2006 levels. The 2014 inventory shows a 12% increase from the 2006 estimate meaning there is much work still to be done.

In September 2016, the federal government announced a plan to implement a price for carbon effective in 2018. The price will be set at an estimated \$10 per tonne of CO<sub>2</sub>e on corporate emissions. No announcement has been made on whether the price plan would be a corporate tax or a cap and trade system. The tax has the potential to affect emissions, exports, and the corporation's tax obligations. A detailed discussion is provided in Attachment 4.

As a reporting requirement to the Compact of Mayors and in an effort to aid local business as Canada transitions to a low carbon economy, the Administration will develop a strategy and business plan that identifies tactics for reducing community and corporate emissions and includes stakeholder and community engagement to determine the role each sector can play to achieve emissions targets.

#### International Council for Local Environmental Initiatives (ICLEI) Membership

ICLEI – Local Governments for Sustainability is a network of local governments working together to advance sustainability. Membership in ICLEI will connect the City with the most ambitious and committed local governments across Canada and around the world, enabling the City to share best practices and access resources to help achieve sustainability goals. To become a member of ICLEI, the City must name a Sponsor from City Council. There are no specific requirements of a Sponsor; however, through the named Councillor, the City of Saskatoon will have access to a network of other communities (both through elected officials and administration) having similar issues and initiatives. Attachment 5 summarizes some of the benefits of joining ICLEI.

#### **Options to the Recommendation**

City Council may choose to forgo joining ICLEI at this time.

#### **Financial Implications**

The next steps in meeting the City's commitments under the Compact of Mayors, target setting, and developing a reduction strategy will be completed utilizing internal resources. A community engagement strategy will be developed utilizing funds remaining in the Greenhouse Gas Reduction Capital Project #2183.

The cost of ICLEI membership is approximately \$3,000. These funds are available in the existing operating budget.

**Environmental Implications**

A positive impact on greenhouse gas emissions is anticipated as a result of implementation of recommendations provided by an emissions reduction business plan. Additional reductions are expected as a result of energy efficiency projects underway such as the Energy Performance Contracts and route optimization with the garbage collection system.

**Communications Implications**

The 2014 GHG Inventory will be posted on the City website, and a media event will be coordinated to share reasons for completing the inventory, key findings and implications, and how the inventory will be used. A Communications and Engagement Plan would be developed to support a strategy for reducing greenhouse gas emissions in our community and in the City of Saskatoon.

**Other Considerations/Implications**

There are no policy, privacy or CPTED implications or considerations.

**Due Date for Follow-up and/or Project Completion**

Specific to next steps under the Compact of Mayors, the Standing Policy Committee on Environment, Utilities and Corporate Services will receive the following reports in 2017:

1. Update on the City of Saskatoon Adaptation Strategy (March 2017)
2. Update on the City of Saskatoon Emissions Reduction Targets (timing dependent on the Saskatoon Environmental Advisory Committee to prepare a recommendation)

In early 2017, the data from the Inventory report will be included in a higher level document representing the four pillars of an Environmental Sustainability Plan. The data and related analysis will provide the context for discussions on issues and options facing our community and will also be submitted to the Standing Policy Committee on Environment, Utilities and Corporate Services.

**Public Notice**

Public Notice, pursuant to Section 3 of Public Notice Policy No. C01-021, is not required.

**Attachments**

1. Saskatoon Community Emissions
2. Saskatoon Corporate Emissions
3. Compact of Mayors Commitments
4. Canada and Carbon Tax
5. ICLEI Membership
6. GHG Inventory Report Executive Summary (full report online)

**Report Approval**

Written by:                   Nasha Spence, Environmental Accounting Manager

## Saskatoon Greenhouse Gas Emissions Inventory and Update on Compact of Mayors

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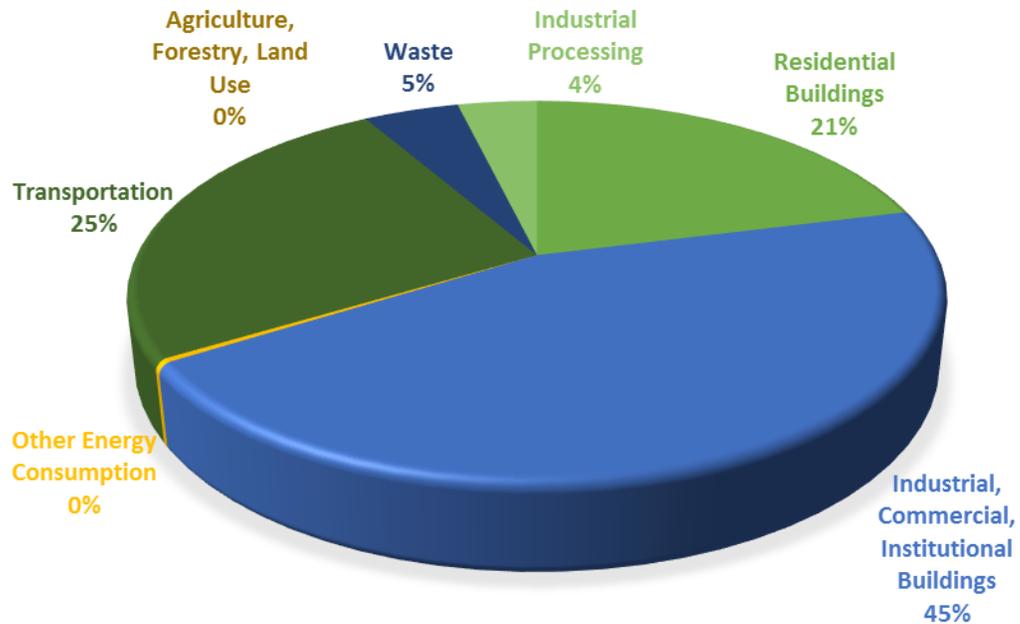
Reviewed by: Matthew Regier, Environmental Coordinator  
Bibian Rajakumar, Project Engineer  
Brenda Wallace, Director of Environmental and Corporate  
Initiatives  
Jason Turnbull, Director of Business Administration  
Mike Jordan, Director of Government Relations

Approved by: Catherine Gryba, General Manager, Corporate Performance  
Department

GHG Inventory.docx

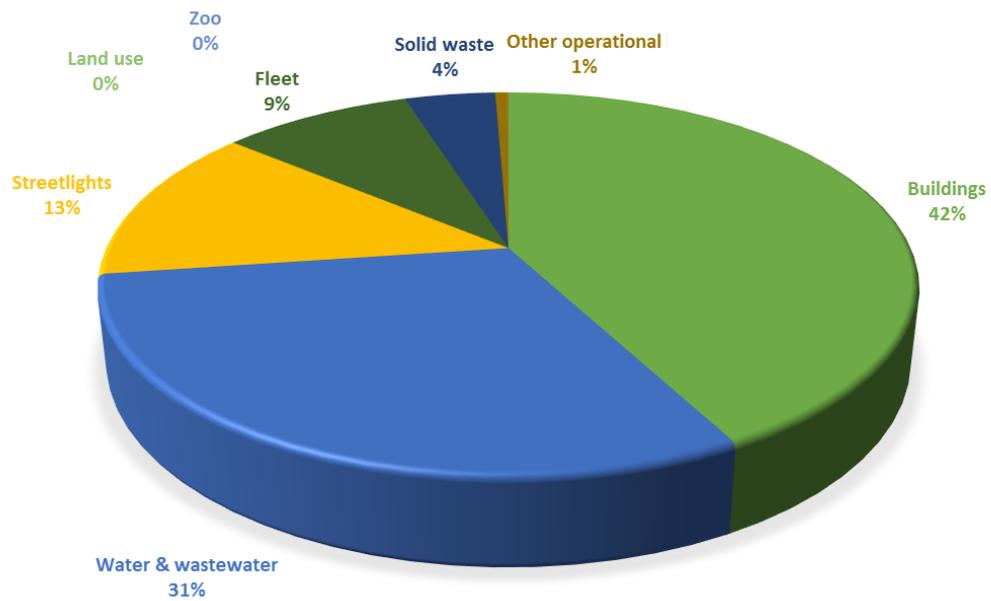
## Community Emissions

Sector	GHG (tonnes of CO <sub>2</sub> e)		
	2003 new standards	2014	% Increase 2014
Residential Buildings	604,686	932,215	54.2%
Industrial, Commercial, Institutional Buildings	2,135,152	1,992,404	-6.7%
Other Energy Consumption	NR	14,129	
Transportation	632,414	1,121,430	77.3%
Waste	49,057	201,357	310.5%
Agriculture, Forestry, Land Use	NR	290	
Industrial Processing	NR	167,550	
<b>Total</b>	<b>3,421,309</b>	<b>4,429,375</b>	<b>29.5%</b>



## Saskatoon Corporate Emissions

Sector	GHG (t of CO <sub>2</sub> e)			
	2003	2003 new standards	2014	% Increase 2014
Buildings	36,270	31,246	45,022	44.1%
Water & wastewater	30,437	24,608	32,702	32.9%
Streetlights	16,925	13,311	14,129	6.1%
Fleet	6,047	6,022	9,640	60.1%
Solid waste	1,619	4,576	4,576	0.0%
Other operational	NR	NR	656	NA
Land use	NR	NR	NR	NA
Zoo	NR	NR	13	NA
<b>TOTAL</b>	<b>91,298</b>	<b>79,763</b>	<b>106,738</b>	<b>33.82%</b>



## Compact of Mayors Commitments



At each phase, the committed city is required to report the results to the Compact of Mayors through an approved method in order to receive acknowledgement and verification of the phase.

Phase	Mitigation	Adaptation
1 – Commitment November 2015	Cities commit to: <ul style="list-style-type: none"> <li>• Reduce local GHG's</li> <li>• Measure community emissions using GPC</li> <li>• Set data-based targets for the future</li> <li>• Develop climate action plan</li> </ul>	Cities commit to: <ul style="list-style-type: none"> <li>• Address impacts of climate change</li> <li>• Identify climate hazards</li> <li>• Assess vulnerabilities</li> <li>• Develop climate adaptation plan</li> </ul>
2 – Inventory December 2016	Complete a community-wide emissions inventory using the GPC standard	Identify climate hazards
3 – Target December 2017	Update emissions inventory & set emissions reduction target	Assess climate change vulnerability
4 – Plan December 2018	Develop climate action plan demonstrating how the city will deliver on its commitment to reduce greenhouse gas emissions	Develop a climate change adaptation plan demonstrating how the city will adjust to actual or expected climate change impacts

Once the Compliance phase has been reached, the city is required to report their inventories, targets, updates, reductions on an annual basis in order to maintain the Compliance rating.

## Carbon Pricing Policies in Canada

### ISSUE:

- On October 2, 2016, the Prime Minister of Canada announced that the Federal Government will implement a pan-Canada approach to pricing carbon pollution in order to help Canada meet its greenhouse gas emission targets.
- Under this approach, all Canadian jurisdictions—meaning provinces—will be required to have carbon pricing in place by 2018.
- The price floor will be set at \$10 per tonne of Carbon Dioxide (CO<sub>2</sub>) emissions 2018 and rising by \$10 each year to \$50 a tonne by 2022.
- The Government of Canada will allow the provinces to choose from two options to implement carbon pricing: (1) a direct price (e.g., carbon tax) and (2) cap-and-trade-system.
- In Canada, the provinces of British Columbia (BC) and Alberta (AB) price carbon by using carbon taxes, while Ontario and Quebec are using a cap-and-trade system. All other provinces are considering various approaches.
- However, the Government of Saskatchewan is vociferously opposed to carbon pricing. Saskatchewan's approach to date is to use technology (i.e., Carbon Capture and Sequestration) to reduce emissions.
- According to Environment Canada data, Saskatchewan has the highest greenhouse gas emissions per capita in the country.
- It is too early to say what impact the Government of Canada's announcement may have on the City of Saskatoon. This will depend on the pricing option that Saskatchewan will choose, the implementation of it, and any potential offsets that the policy will include.

### BACKGROUND

- In 2008, the Government of British Columbia implemented a revenue neutral carbon tax, meaning the government's total tax revenues did not change because of the carbon tax as it reduced other taxes, like personal incomes taxes.
- The BC government phased-in the carbon tax over a period of four years, being fully implemented in 2012 at \$30 per tonne of CO<sub>2</sub> equivalent emissions.
- In 2013, the Government of Quebec introduced a cap-and-trade system which covers business emitting 25,000 metric tonnes or more of CO<sub>2</sub>e per year and fuel distributors selling more than 200 litres of fuel. The system covers about 85 per cent of Quebec's GHG emissions.
- Since January 1, 2014, Quebec's cap-and-trade system has been linked to California through the Western Climate Initiative (WCI).
- In 2016, the Ontario government introduced legislation to adopt a cap-and-trade system, which takes effect on January 1, 2017. Ontario's approach is very similar to Quebec's and it will link with Quebec and California in the WCI.
- In May 2016, the Government of Alberta announced that it will be implementing a new carbon tax on transportation and heating fuels, including diesel, gasoline, natural gas and propane. The levy will apply as of January 1, 2017 at a rate of \$20 per tonne, and will increase to \$30 per tonne on January 1, 2018

- In March 2016, Canada's First Ministers committed to putting Canada on a credible path to meet or exceed a national target of reducing greenhouse gas (GHG) emissions by 30 percent below 2005 levels by 2030.
- The First Ministers agreed that this will require transitioning to a low-carbon economy by adopting a range of measures, including carbon pricing, adapted to the specific circumstances of each province and territory.
- In October 2016, in response to the Prime Minister's announcement, the Government of Saskatchewan released a "White Paper" on its approach to reducing emissions, which rejects broad based carbon pricing and places the focus on technology and innovation.

### **ANALYSIS/DISUCSSION/NEXT STEPS**

- Carbon pricing is essentially a financial instrument that national and subnational governments around the world are using to help reduce carbon emissions.
- They are intended to place a price on carbon pollution so as to induce behavioural changes by individuals and firms.
- As indicated by the Prime Minister's announcement, there are two common methods of carbon pricing: (1) cap-and-trade system and (2) carbon taxation.
- In a Cap-and-Trade System:
  - governments cap total carbon emissions and then give or sell companies carbon permits that add up to the cap.
  - Companies can then trade permits with each other.
  - Those who can reduce emissions cheaply and easily sell permits to those who cannot.
  - The price of the permits is variable, depending on the market, but generally, the lower the cap, the higher the price.
- In a Carbon Taxation regime:
  - governments impose a fee on carbon:
  - the more a company emits, the more they pay.
  - The price determines how effective the policy will be at lowering emissions—the higher the price, the greater the reductions.
- The table below illustrates the advantages and disadvantages of each carbon pricing mechanism at a very high level.

**Table 1: The Advantages and Disadvantages of Carbon Pricing Mechanisms**

<b>Mechanism</b>	<b>Potential Advantages</b>	<b>Potential Disadvantages</b>
<b>Cap-and-Trade</b>	<ul style="list-style-type: none"> <li>• Drives cost effective emissions reductions</li> <li>• Emissions are capped: amount of carbon emitted is set by policy</li> <li>• Creates opportunities to link with other systems, broadening scope and harmonizing systems</li> </ul>	<ul style="list-style-type: none"> <li>• More administratively complex to implement &amp; manage</li> <li>• Allows for price volatility because the price fluctuates</li> <li>• Reduces scope for revenue recycling</li> </ul>
<b>Carbon Taxation</b>	<ul style="list-style-type: none"> <li>• Drives cost effective emissions reductions</li> <li>• Provides price certainty</li> <li>• Simple, transparent, easy to administer as it functions within existing tax regime</li> </ul>	<ul style="list-style-type: none"> <li>• Typically has large public opposition</li> <li>• Does not provide certainty as to the quantity of emissions reductions to be achieved</li> <li>• Emissions reductions depend on consumer sensitivity to prices</li> </ul>

- In terms of a carbon tax, the British Columbia experience suggest that GHG emissions were initially reduced following the implementation of the carbon tax, but then started to increase, albeit at a slower annual pace than it had previous to the implementation of the carbon tax.
- This suggests that the carbon price was not set high enough to elicit more significant behavioral changes.
- The cap-and-trade systems have to be fully implemented in Canada so there are no measureable results to its efficacy in reducing emissions in Canada.
- So what are the implications to municipalities in jurisdictions with carbon pricing?
- In BC, the government incented local governments to better manage their emissions by allowing those that commit to carbon neutrality by 2012 to access the Climate Action Revenue Incentive, a grant that offsets 100 percent of the carbon tax local government's pay.
- The Government of Saskatchewan's recently released Climate Change "White Paper" provides 13 recommendations that outlines the province's plan to address climate change and reduce emissions.
- However, in terms of carbon pricing the Governments position is: "*Saskatchewan calls on the federal government to abandon plans for a national carbon tax,*" and "*Saskatchewan calls on Canada to reject a national cap and trade system as an option.*"

## ICLEI Membership

ICLEI – Local Governments for Sustainability (International Council for Local Environmental Initiatives) is a network of local governments working together to advance sustainability. Membership in ICLEI will connect the City with the most ambitious and committed local governments across Canada and around the world, enabling us to share best practices and access resources to help us reach our sustainability goals.

The following table outlines the primary benefits associated with being an ICLEI member:

<b>Benefit</b>	<b>Overview</b>
Exclusive Access to ICLEI Resources	Access to resources on local sustainable development, including climate change response, biodiversity, water management, sustainability management and sustainable procurement.
Priority Access to New ICLEI Campaigns and Projects	Opportunity to pilot new campaigns, initiatives and projects; discount to participate in ICLEI programs, including Adaptation Initiative.
Access to Events and International Networking Opportunities	Opportunity to participate in national and international conferences, events, delegations and study tours that provide important opportunities to learn and exchange ideas, best practices and other innovations with the global sustainability community.
National and International Profiling	Initiatives and programs of ICLEI members are regularly featured in a variety of publications, including ICLEI's international newsletter and website.

Source:

[http://www.icleicanada.org/images/icleicanada/pdfs/Benefits\\_of\\_Membership.pdf](http://www.icleicanada.org/images/icleicanada/pdfs/Benefits_of_Membership.pdf)

## **2014 Saskatoon Greenhouse Gas Emissions Inventory - Executive Summary**

The 2014 Saskatoon Greenhouse Gas Emissions Inventory supports federal and international reporting standards. The inventory is meant to provide a representation of Saskatoon's total emissions as well as emissions by sector to support the exploration of emissions abatement strategies in the community, and efficiencies within City of Saskatoon operations.

Saskatoon joined the Compact of Mayors in 2015 to demonstrate a commitment to respond to climate change and acknowledge that local action can have significant global impact. As a result, the City is required to engage in mitigation and adaptation reporting, target setting and implementation of a climate change plan, to be completed and maintained in 2018. This coincides with the timing of the federal government announcement to implement a price on carbon in 2018. The carbon price comes as a result of the Canadian government commitment by way of the Paris Climate Agreement to reduce emissions and engage in activities to keep global temperatures within 2 degrees Celsius above pre-industrial levels.

Saskatoon conducted an emissions inventory in 2003, and has produced estimates for 2006 and 2013. During this time, an emissions reductions target for the City of Saskatoon Corporation was set to 30% below 2006 levels by 2023.

Overall, the Saskatoon community emissions have increased 12% since the 2003 inventory. Additional sectors were analyzed for the 2014 inventory to report a more comprehensive emissions inventory. Eliminating these additional sectors continues to produce an 8% increase since the 2003 emissions inventory. Industrial, commercial and institutional energy consumption in buildings is the highest emitter, but has realized a 38% decline in emissions since the 2003 inventory, whereas emissions associated with residential buildings increased by 54%.

The City of Saskatoon corporate emissions increased 39% since the 2003 inventory. The highest emitting sector is realized in building energy, with administrative and operational buildings consuming a greater share than recreational facilities and emergency services.

***The full report is available on-line.***

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## Aquatic Invasive Species: Response to PARCS

### Recommendation

That the report of the General Manager, Corporate Performance Department, dated November 14, 2016, be forwarded to City Council for information.

### Topic and Purpose

This report is the Administration's response to the letter from the Provincial Association of Resort Communities of Saskatchewan (PARCS) regarding aquatic invasive mussels and provides an overview of City of Saskatoon (City) activities in support of provincial aquatic invasive species programming.

### Report Highlights

1. The City receives drinking water from the South Saskatchewan River. Lake Diefenbaker, upstream of the city along the river, is at risk for aquatic mussel infestation.
2. The City does not currently have programming targeted at educating residents about aquatic invasive mussels as it is a member of the South Saskatchewan River Watershed Stewards (SSRWSI), which receives funding from the province to carry out an awareness campaign about aquatic invasive mussels within our watershed.
3. The province has installed a sign outside of city limits on Highway 11 to Prince Albert and has offered additional free highway signs to the City to help raise awareness of aquatic invasive mussels.

### Strategic Goal

This report supports the Strategic Goal of Asset and Financial Sustainability by supporting programs that protect our drinking water source and our municipal water infrastructure. It also supports the Strategic Goal of Quality of Life by protecting our primary service of providing affordable, high quality drinking water to our citizens.

### Background

The Standing Policy Committee on Environment, Utilities and Corporate Services received a letter from PARCS on May 9, 2016, asking for support, by motion, and with a letter to the Premier, for a comprehensive systematic border inspection program for invasive mussel species that are commonly carried on boats. The Committee forwarded the letter to the Administration for further reporting. Attachment 1 is a copy of the letter.

### Report

#### Lake Diefenbaker at Risk for Aquatic Invasive Species

Saskatoon's drinking water comes from the South Saskatchewan River. Upstream of our community, the river flows through Lake Diefenbaker and the Gardiner Dam, which also houses an integrated hydroelectric station. The Lake is at high risk of infestation

by aquatic invasive mussels because of the many out-of-province boats that visit the lake for recreational purposes.

Invasive mussel populations are very difficult to control and have profound negative effects on the ecosystems and infrastructure they impact. If mussels became established in Lake Diefenbaker, impacts to Saskatoon residents would likely include higher costs for utilities (water and power) related to increased infrastructure maintenance and changing treatment requirements, as well as reduction in the recreational opportunities available in and around Saskatoon.

### Current Awareness and Education Initiatives

Awareness and education initiatives are implemented by local watershed groups using funding provided by the province. The City is a member of the SSRWSI, who have been carrying out an awareness and education campaign on invasive mussels in our watershed for the past two years. Activities have included:

- Television and radio interviews,
- Presentations throughout the watershed,
- Establishment of 30 monitoring stations for mussels, and
- Installation of signage at boat docks on high-risk lakes and along the river.

The City is also represented on the Saskatchewan Invasive Species Council (SISC) and has partnered with SISC in the past for awareness and education programming about other invasive species.

Invasive species are sometimes purchased or transported unknowingly by residents, and cause problems when released back into the environment. Those that are now banned in Saskatchewan include several species of insects, fish, crabs, snails, clams, mussels, and plants. Information about these species can be found on the websites of the Ministry of Environment, Ministry of Agriculture, and Saskatchewan Invasive Species Council.

Education initiatives in Saskatoon are currently linked to municipal public health concerns (West Nile virus), urban forestry management (emerald ash borer, gypsy moth, Asian long-horned beetle, Dutch elm disease), and weed management. There is currently no municipal programming targeting awareness of aquatic invasive mussels.

### Additional Awareness through Signage in Saskatoon

Highway signage has been produced by the province as part of education and awareness programming for aquatic invasive mussels. The province has installed one sign on the outskirts of Saskatoon and offered free signage to the City for installation within city limits. The Administration is currently considering the feasibility of this installation.

The province has previously provided signage to the City in support of the ban on firewood transportation related to the Dutch elm disease prevention campaign.

**Public and/or Stakeholder Involvement**

Stakeholders are currently being consulted regarding the potential need for a municipal education initiative regarding aquatic invasive mussels and the installation of highway signage within city limits.

**Environmental Implications**

The City’s membership with the SSRWSI has indirectly supported the provincial campaign to prevent the spread of aquatic invasive mussels in our local watershed. Any further direct actions by the City will also help to spread education and awareness of this threat and will demonstrate the City’s commitment to protecting our drinking water supply from aquatic invasive species.

**Other Considerations/Implications**

There are no policy, financial, privacy or CPTED implications or considerations and a communication plan is not required.

**Due Date for Follow-up and/or Project Completion**

Further information about aquatic invasive mussel education and awareness will be provided in the annual membership renewal report for the SSRWSI.

**Public Notice**

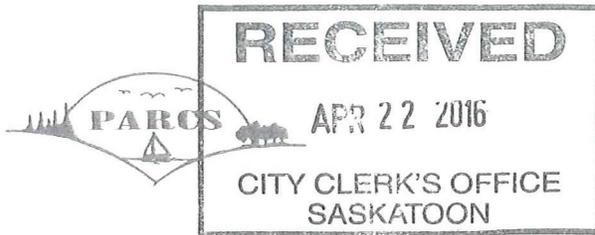
Public Notice pursuant to Section 3 of Policy No. C01-021, Public Notice Policy, is not required.

**Attachment**

1. Letter from PARCS

**Report Approval**

Written by: Twyla Yobb, Watershed Protection Manager, Environmental & Corporate Initiatives  
Reviewed by: Jeff Boone, Acting Superintendent of Forestry and Pest Management, Parks  
Brenda Wallace, Director of Environmental and Corporate Initiatives  
Approved by: Catherine Gryba, General Manager, Corporate Performance Department



**AIM to STAB**

**Aquatic Invasive Mussels - Stop Them at the Border**

A coalition of Saskatchewan Communities supported by:

- SUMA (Saskatchewan Urban Municipalities Association)
- SARM (Saskatchewan Association of Rural Municipalities)
- SAW (Saskatchewan Association of Watersheds)

**From:** Lynne Saas, Coordinator of Member Services  
The Provincial Association of Resort Communities of Saskatchewan (PARCS)  
[parcs@sasktel.net](mailto:parcs@sasktel.net), (306) 630-9698

**Date:** April 19, 2016

**To:** Administrator

**Re:** The threat to communities on the North/South Sask Rivers and the Qu'Appelle lakes

The Provincial Association of Resort Communities (PARCS) with the support of SUMA, SARM and SAW is undertaking an initiative to inform many Saskatchewan communities about the threat posed by aquatic invasive species, in the hopes of persuading the government to implement border inspections to stop this threat.

Please distribute a copy of our letter and the enclosed informational material to your Mayor and Council. We urge them to support our position both by motion and with a letter to our Premier.

Thank you for your assistance in forwarding this material to your Mayor and Council.



297-1

## AIM to STAB

### Aquatic Invasive Mussels - Stop Them at the Border

A coalition of Saskatchewan Communities supported by:

- SUMA (Saskatchewan Urban Municipalities Association)
- SARM (Saskatchewan Association of Rural Municipalities)
- SAW (Saskatchewan Association of Watersheds)

**From:** The Provincial Association of Resort Communities of Saskatchewan (PARCS)  
[parcs@sasktel.net](mailto:parcs@sasktel.net), (306) 630-9698

**Date:** April, 2016

**To:** Mayor Don Atchison & Council  
City of Saskatoon  
Box 222-3<sup>rd</sup> Ave N.  
Saskatoon, SK, S7K 0J5

**Re:** The threat to communities on the North/South Sask Rivers and the Qu'Appelle lakes

If your community is one of the many communities in the province that draw their **drinking water** from the North Saskatchewan or South Saskatchewan Rivers<sup>1</sup>, you need to closely examine the enclosed AIM to STAB document.

Since lakes in Ontario became infected with Zebra and Quagga mussels, the annual cost for managing those mussels has been estimated at \$75 to \$90 million a year<sup>2</sup>. The **majority of those costs are born by municipalities annually having to clean their clogged intake pipes for their municipal water systems.**

These same mussels have now travelled from the east and infected Lake Winnipeg and smaller lakes at our eastern doorstep in Manitoba. The Manitoba government has recently announced plans to spend a million dollars annually on a boat inspection program. Alberta has a comprehensive border inspection program to stop these mussels at their border. Last summer their inspectors stopped and decontaminated 11 infected boats that had travelled across our province. Had one of those boats put into the North or South Saskatchewan, or into the Qu'Appelle chain, your municipality would now be facing huge costs for maintaining your water system.

During the recent provincial election, PARCS member communities wrote to candidates asking them to describe their party's plan for dealing with this threat. While the Green Party announced its support for an inspection program, the NDP and Liberals were silent, and the Sask Party, in a letter signed by Premier Brad Wall, stated that their government would "stand on its record". An examination of page 3 of the attached document details how our province has been the only western province to fail to take a stand to stop these mussels at the border

The coalition of PARCS, SUMA, SARM and SAW are pledged to raise this matter to the new government when it next sits. We are asking you to send a letter expressing your concerns about the threat of an infestation of these mussels into the waters that feed your municipal water supply. We are asking that **your letter go forward as soon as possible before the new government is called to sit.**<sup>3</sup>

We need to stand together to protect our drinking water infrastructure from costly infection.

<sup>1</sup> These river systems include Lake Diefenbaker and Tobin Lake. The South Sask feeds into Buffalo Pound Lake, Last Mountain Lake and the Qu'Appelle chain. One mussel in this system will ultimately contaminate the entire interconnected waterways.

<sup>2</sup> <http://news.nationalpost.com/news/canada/why-are-zebra-mussels-in-lake-winnipeg-such-a-calamity-when-theyve-been-in-the-great-lakes-for-decades>

<sup>3</sup> Address your letter to Premier Wall at Room 226, 2405 Legislative Drive, Regina, SK, S4S 0B3, or fax 787-0885, or email [premier@gov.sk.ca](mailto:premier@gov.sk.ca)

# AIM to STAB

## *Aquatic Invasive Mussels - Stop Them at the Borders*

### BACKGROUND

#### 1. What is STAB?

STAB is a group of individuals, communities and organizations sharing a belief that the only way to save our Saskatchewan lakes and rivers from aquatic invasive mussels is to stop those mussels at the border before they enter the province. Although initiated by PARCS, STAB includes membership from many other groups and organizations across the province.

#### 2. What is PARCS?

PARCS is the Provincial Association of Resort Communities of Saskatchewan. <sup>i</sup>

#### 3. What are aquatic invasive mussels?

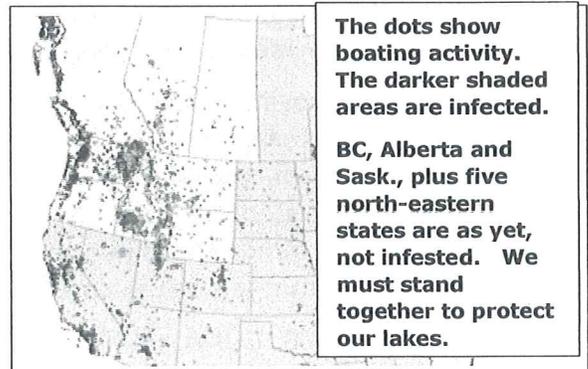
These tiny Zebra and Quagga mussels (as small as a grain of rice, as large as a fingernail) are much smaller than our Saskatchewan mussels (or clams as they are often called)<sup>ii</sup>. Also, unlike native mussels which bury into the bottoms of lakes and rivers, these foreign mussels attach themselves to hard surfaces like the hulls of boats, docks, motors, anchors, and most dangerous of all, to the insides of the intake pipes leading to water treatment plants, to hydroelectric generators and to irrigation systems. Any mussel seen attached to a hard surface is a foreign mussel.

#### 4. How did these mussels get into Canada?

It is believed that they arrived in the USA in 1986 via the ballast water of cargo vessels. The species spread from the eastern USA into Canada's eastern waterways. In 2009 zebra mussels were found in Saskatoon on a recreational vehicle from the USA. The boat was decontaminated. In 2011 these mussels were detected in the Red River, in North Dakota. In 2012 officials in the State of Utah intercepted a contaminated boat returning from Lake Mead, Nevada, and heading for Saskatchewan. It was quarantined and decontaminated. By 2013 Lake Winnipeg, Cedar Lake and the Red River in Manitoba were infected.

#### 5. Why are these mussels so dangerous?

***"Once introduced it is virtually impossible to eradicate them making prevention key to stopping their spread to the west".*** <sup>iii</sup> The north western states (shown on the right) have implemented aggressive prevention programs that have been successful to date.



#### 6. How do these mussels reproduce?

An adult mussel will spawn up to a million eggs which thrive in temperatures of 10 to 17 degrees C in depths of 4 to 7 metres. They can live up to 30 days out of water, which enables them to hitchhike from other provinces and states, attached to infested boats.

#### 7. How far west have these mussels travelled to date?

The mussels have spread from the east toward the west. BC, Alberta, Saskatchewan and the five north-western states have been called upon to adopt aggressive practices to prevent the spread of these destructive mussels into the north-west part of the continent. In 2015, 11 mussel boats were stopped on the Alberta border and decontaminated. ALL OF THESE BOATS HAD TRAVELLED FROM EASTERN CANADA THROUGH SASKATCHEWAN.<sup>iv</sup> ***Saskatchewan is very vulnerable.***

## IMPACTS

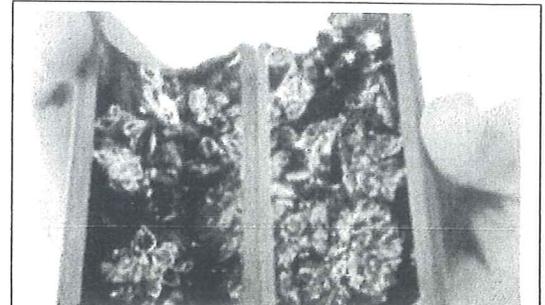
### 8. What are the major economic impacts of an invasive mussel infestation?

In 2013, the **Alberta** Department of Environment and Renewable Resources estimated that the **ANNUAL COST** of an invasive mussel infestation would be **\$75 million:** <sup>v</sup>

<b>Power generation</b>	\$ 5,938,487
<b>Drinking water systems</b>	\$ 20,839,921
Boat maintenance	\$ 390,600
Recreational fishing	\$ 21,830,892
<b>Water management structures</b>	\$ 8,841,373
Water diversion intakes	\$ 3,910,000
Property value	<u>\$ 13,789,500</u>
Total annual cost estimated at	\$ 75,540,773 <sup>vi</sup>

The largest part of these costs would come from an infestation on Alberta's water-operated infrastructure due to:

- Filling intake pipes, irrigation lines, dam operations,
- Clogging screens,
- Requiring new capital and maintenance costs,
- Increased costs to users,
- Costs of crop & food production; drinking water and waste water.



**Clogged intake pipes for drinking water, irrigation and hydroelectric power will cost millions for Saskatchewan tax payers every year.**

An impact study in Ontario shows that they are spending \$75 to \$91 million annually as a result of the mussel invasion. <sup>vii</sup> A study conducted by the Okanagan Basin Water Board estimated a cost of at least \$43 million each year in lost revenue and added maintenance of aquatic infrastructures. <sup>viii</sup>

### 9. What is the impact of these mussels on fish populations?

An infestation causes an increase in fish species such as yellow perch that feed on shallow-bottom organism and a decrease in fish that feed on deep water organisms, such as northern Pike and native trout. Mussels eat plankton, causing rapid changes to the food web and physical environment of fish.

### 10. Will these mussels like it in Saskatchewan?

Biologists feel that the ecological risk is high. We have the correct water quality for mussels to survive and a growing number of boats both leaving and coming into our province. Most of Saskatchewan is classified as having "a very high probability of invasion".<sup>ix</sup>

### 11. Which Saskatchewan lakes are most at-risk?

While all lakes are at risk, the Fisheries Branch<sup>x</sup> have stated that the Boundary Dam Reservoir, the South Saskatchewan (Lake Diefenbaker) system, the Qu'Appelle Lakes and Tobin Lake are most likely to be visited by out-of-province boats. Saskatchewan boats leaving our province also pose a risk.

### 12. How many Saskatchewan people would be affected by an infestation of foreign mussels?

We know that about half of Saskatchewan's drinking water comes from the fresh waters flowing into our province through the South Saskatchewan River, flowing north out of Gardiner Dam, through Saskatoon and on to Tobin lake, and flowing south through Buffalo Pound which provides water to Moose Jaw and Regina, into Last Mountain Lake and into the Qu'Appelle Chain of lakes. All of these people could face higher utility bills for drinking water. The effect on the hydroelectric power could have a similar effect on electrical bills. Consider the impact on the irrigation industry, the decrease in property values for cottage owners, and the loss of tourism and fisheries. A mussel infestation would be devastating on any lake and mean significant costs for all the tax payers of Saskatchewan.<sup>xi</sup>

# PREVENTION

## 13. What have the Prairie Provinces been doing to prevent the infection of their lakes?

This chart summarizes the initiatives undertaken taken by the Prairie Provinces to date. <sup>xii</sup>

Program	Description	Effect	Alberta	Manitoba	Sask.
CLEAN / DRAIN / DRY EDUCATIONAL PROGRAM	<ul style="list-style-type: none"> <li>An informational program to train boaters to act responsibly.</li> <li>Posters at boat launches, marinas</li> <li>Aimed at effecting behavior change</li> </ul>	<ul style="list-style-type: none"> <li><b>Most useful in areas that are already infected, to prevent spread of infection</b></li> <li>Not really applicable to stay-at-home boaters in Sask</li> </ul>	✓	✓	✓
MONITORING	<ul style="list-style-type: none"> <li>Volunteers taking samples from lakes to check for adults (substrates) and/or juveniles (veliger)</li> </ul>	<ul style="list-style-type: none"> <li><b>BUT - If the samples come back positive – it's TOO LATE TO DO ANYTHING BY THAT TIME</b></li> </ul>	✓ 73 lakes in 2015	✓ 30 lakes in 2015	✓ 5 lakes in 2015
HOTLINE	<ul style="list-style-type: none"> <li>24/7 response to send out decontamination unit</li> </ul>	<ul style="list-style-type: none"> <li><b>Works best in combination with an inspection program</b></li> </ul>	✓ 1-855 336-BOAT	✓ 1-877- 667-2470	✓ 1-800 667-7561
LEGISLATION	<ul style="list-style-type: none"> <li>Recent Alberta Ministerial Order gives authority to fishery officers</li> </ul>	<ul style="list-style-type: none"> <li>Necessary in order to implement border inspections</li> </ul>	✓	✓ New regulations recently announced	✗
DECONTAMINATION UNITS	<ul style="list-style-type: none"> <li>Portable hot-water sprayers used to clean contaminated boats</li> </ul>	<ul style="list-style-type: none"> <li>A necessary part of border of border inspections</li> </ul>	✓ BC has units at its highway & entrances to parks	✓ Alberta has 1 at each of 9 highway stations plus 4 roving units	? Sask has only 2 units in the province
BORDER INSPECTIONS	<ul style="list-style-type: none"> <li>Based on the model used in the western states</li> <li>Focus is on major highways</li> <li>Seasonal wage staff</li> <li>Focus on adult mussels</li> </ul>	<ul style="list-style-type: none"> <li>The only way to keep infected boats out of the province!</li> </ul>	4000 inspections in 2014 2 fouled boats 20+ washes	\$1 million pledged <sup>xiii</sup>	✗

**THE SASKATCHEWAN GOVERNMENT HAS BEEN THE ONLY WESTERN PROVINCE TO REFUSE TO PASS THE NECESSARY LEGISLATION AND REGULATIONS OR TO ALLOCATE THE FUNDS FOR IMPLEMENTING BORDER INSPECTIONS.**

## 14. If many of these boats are coming in from the US and Manitoba for our fishing derbies, could the province not enact mandatory inspections of boats at these derbies?

Organizers of major fishing derbies are quick to explain that many of the out-of-province competitors arrive several days or even a week prior to the tournament and 'practice fish', checking out the best spots on the lake prior to the tournament. Inspections on the day of the tournament are, for a large part, too little too late.

## MAKING IT HAPPEN

### 15. Has there been recent correspondence with the government on this matter?

#### Letters to Premier & Minister of Environment

**March 9, 2015** – “PARCS asked Minister to allocate a trained staff person to assume leadership for preventing contamination of our lakes.”

**October 27, 2015** – Sask Association of Watersheds asked Minister why there was no information about invasive mussels at border crossings.

**Sept. 22, 2014** – PARCS applauded the the Ministry’s educational efforts and warned that more was needed..

**Nov. 17, 2015** – PARCS President Jimmy reviewed previous correspondence & insisted that “education alone will not prevent the spread of these mussels into our lakes. ... ***It is time for our government to consider an ounce of prevention in the form of border inspections.***”

#### Replies

**May 6, 2015** – Minister’s letter announced of a new watercraft decontamination unit and Aquatic Invasive Species Awareness Week in Saskatchewan

**October 28, 2015** Minister to PARCS member stated that it was up to Manitoba to prevent contaminated boats from leaving that province & claimed to be monitoring of high-risk lakes.

#### **No reply received**

**December 2, 2015** – Minister spoke of 2 new decontamination units, plans to “explore options for boat inspection training for border officers”, plus continued focus on education.

### 16. What might it cost to implement a border inspection program?

The following projection has been based on the same variables as the model used in Alberta and the states immediately to the south.

WHERE	HIGHWAYS	SITES	WEEKS	DAYS	HOURS	WAGES
On the Manitoba Border	#106 from Flin Flon #9 from The Pas #10 from Roblin #16 Yellow Head #! Trans Canada #18 To Estevan	10 sites	Mid-May, to Mid-Sept = 19 weeks	X7 days  = 1330 days	X 24 hours per day (2 staff x 12 hours per day)  = 31,920 hours	X \$20 per hour = <b>\$636,400 per year</b> (includes benefits & training) Plus equipment and coordination
On the US Border	#47 to Estevan #6 to Regina #4 to Swift Current		X19 weeks for 10 sites			
	1 roving		= <b>190 weeks</b>			

**NOTE:** The Manitoba Government has **pledged to spend one million dollars in 2016:**

- \$ 800,00 for inspection and decontamination at more key locations
- \$ 170,00 for public awareness, additional signs and advertising
- \$50,000 for enforcement and \$25,000 for a new research and development fund.
- Fines will be imposed for carrying zebra and quagga mussels.

## WHAT WE NEED FROM OUR GOVERNMENT

The members of STAB urge that the government of Saskatchewan<sup>1</sup>:

1. Continue and expand the building of **AWARENESS** via the Clean/Drain/Dry program and the **MONITORING** of our lakes, **plus**
2. Adopt new legislation, new regulations and new funding to implement **border checks**, along with **PENALTIES** to ensure **ENFORCEMENT**.

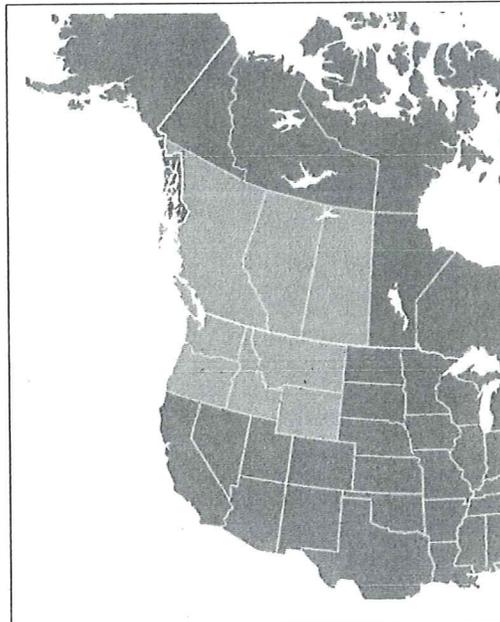
*Stop them at the borders.*

*Can we afford not to?*



*Keep Saskatchewan lakes free from these dangerous mussels.*

*Can we afford not to?*



*“In the summer of 2015, Alberta inspected 21,000 boats at their border with Sask and found 11 mussel boats which were then decontaminate. All of those boats travelled from Ontario across Saskatchewan.”<sup>2</sup>*

*How long can we dodge the bullet?  
Can we afford not to act?*

<sup>2</sup> *Kate Wilson*

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<sup>1</sup> Kate Wilson, Alberta Department of Environmental and Sustainable Resources, states that a typical AIS program has four components: 1) education and outreach, 2) monitoring, 3) enforcement response, 4) policy and legislation

## REFERENCES

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- <sup>i</sup> PARCS members include resort villages, hamlet cottage communities, rural municipalities with cottage communities and cottage owner associations.
- <sup>ii</sup> Adults are 1 to 3 cm in size. Young zebra and quagga mussels (called veligers) are so tiny that they can look and feel like sandpaper.
- <sup>iii</sup> After the infection of Lake Winnipeg, Manitoba officials claimed that infusions of potash would kill the mussels. However subsequent reports from scientists state that "the problem is irreversible".  
<http://globalnews.ca/news/2266803/lake-winnipeg-is-a-lost-cause-due-to-zebra-mussels-expert/>
- <sup>iv</sup> Kate Wilson, Alberta Department of Environmental and Sustainable Resources, "Provincial Aquatic Invasive Species Prevention Program".
- <sup>v</sup> Neupane, A. "An Estimate of Annual Economic Cost of Invasive Dreissenid Mussels to Alberta", Alberta ESRD, Nov. 2013
- <sup>vi</sup> It should be noted that a predicted annual cost of \$75 million is for approximately 100 lakes in Alberta. There are 100,000 lakes in Saskatchewan!
- <sup>vii</sup> See number IV above.
- <sup>viii</sup> Okanagan Basin Water Board, pamphlet "Spread the Message, Not the Mussel", 2012.
- <sup>ix</sup> Just google Department of Fisheries and Oceans and Dreissenid mussel risk to read about it.
- <sup>x</sup> Fisheries Branch of Saskatchewan Environment.
- <sup>xi</sup> <http://www.southsaskriverstewards.ca/water-quality-assessment.html>
- <sup>xii</sup> Early in 2016, the Manitoba Minister of Conservation and Water Stewardship, Tom Nevakshonoff announced that the Manitoba Government will dedicated \$1 million toward the fight against invasive mussels in 2016.

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## 2016 Update to Our Environment: The City of Saskatoon's Environmental Leadership Report

### Recommendation

That the report of the General Manager, Corporate Performance Department dated December 6, 2016, be received as information.

### Topic and Purpose

The purpose of this report is to provide the 2016 update to *Our Environment: The City of Saskatoon's Environmental Leadership Report*.

### Report Highlights

1. The 2016 update to the City of Saskatoon's (City's) *Our Environment* report is provided in the form of an online reporting tool highlighting the status of 16 selected indicators representing the key components of the state of Saskatoon's environmental health – air, land, water and waste.
2. New indicators added to the 2016 update are: bird population count, corporate alternative energy projects, maximum daily demand for water, and total waste disposal and diversion.
3. Key findings include:
  - Saskatoon's 2014 Ecological Footprint was 7.38 global hectares per person, which is an increase of 1.4% from 2010 and 7% from 2003.
  - The waste diversion rate for 2015 of 21.0% was a small decrease from the 2014 rate of 22.5%, and needs improvement to meet the target of 70%.
  - The total amount of waste accepted by City disposal programs has decreased faster than diversion programs, showing a general trend of improvement in overall amount of waste generated in the community between 2014 and 2015.
  - The residential water consumption per capita has increased slightly between 2014 and 2015, but continues to remain relatively stable since 2010.
  - The amount and distribution of new development investment illustrates that investment in development activities are balanced across the city.
  - Over the past decade, the number of Western Meadowlarks counted have decreased over time, while both the Merlin and Peregrine Falcon counts have improved.
  - There are currently six completed alternative energy projects by the City of Saskatoon, reducing corporate GHG emissions by 51,557 tonnes CO<sub>2e</sub> per year.
  - The maximum daily demand at the Water Treatment Plant has increased between 2010 and 2015, but remains below the levels seen in 2006 and 2007.

### Strategic Goal

The 2016 update addresses the Strategic Goal of Environmental Leadership. It includes the following success indicators from the Strategic Plan: waste diversion, water consumption, corporate greenhouse gas (GHG) emissions, the ecological footprint of

Saskatoon, and community gardens. It further addresses the vision, priorities and strategies of the Strategic Plan in the areas of sustainable growth and transportation, protected lands, water quality, and reducing landfilled waste.

**Background**

On October 13, 2015, the Standing Policy Committee on Environment, Utilities & Corporate Services received the 2015 update to *Our Environment*.

**Report**

The first *Our Environment* report was released in 2014 based on the City’s Strategic Plan Goals and success indicators. The report established baseline data for 44 environmental indicators in Saskatoon.

In 2015, the first online update was provided for 12 selected indicators that represent key components of environmental health where data is available and highlight recently set Corporate Targets.

The 2016 online update has added four new indicators: bird population count, corporate alternative energy projects, maximum daily demand for water, and total waste disposal and diversion. Additional indicators will be added in future online updates and new data posted when it is made available. The update can be found at [saskatoon.ca/ourenvironment](http://saskatoon.ca/ourenvironment).

The 2016 online update continues to use the same format as the 2015 update.

- The “Where are we now?” section includes maps and charts to visually display the data in an easy-to-read and web-friendly format. The update compares the most recent data with the baselines published in the 2014 report and, where applicable, the targets adopted by the City.
- The “What are we doing?” section shows how the City is taking action to maintain or improve the environment. This section highlights current initiatives, provides a brief summary and provides a link to where more information can be found.
- The “What can you do?” section provides residents with opportunities to take action and get involved, highlighting simple things people can do in their homes, schools and workplaces, and ways to participate in city-led initiatives.

The 16 selected indicators and their trends are:

Ecological Footprint	Needs Improvement
New Development Investment	Stable
Protected Lands	Stable
Bird Population Count	Stable
Community Gardens	Improving
Corporate Greenhouse Gas Emissions	Needs Improvement
Community Greenhouse Gas Emissions	Needs Improvement
Corporate Alternative Energy Projects	Improving
Transportation Choices	Needs Improvement
Air Quality	Needs Improvement

Water Quality	Stable
Water Consumption	Stable
Maximum Daily Demand for Water	Needs Improvement
Landfilled Waste	Improving
Waste Diversion	Stable
Total Waste Disposal and Diversion	Improving

**Communication Plan**

Communications include the news media and the City’s social media accounts along with the City’s website, which has been updated to reflect the performance of key indicators for the *Our Environment* report.

**Environmental Implications**

As a report focused on environmental health, *Our Environment* provides an overview of key performance indicators relating directly to the City’s Strategic Goal of Environmental Leadership. Where applicable, the implications associated with the indicators have been identified in the report.

**Other Considerations/Implications**

There are no policy, financial, privacy, or CPTED implications or considerations.

**Due Date for Follow-up and/or Project Completion**

Updates and the introduction of additional indicators are anticipated to be communicated annually. In early 2017, the data from this report will be included in a higher level document representing the four pillars of an Environmental Sustainability Plan. The data and related analysis will provide the context for discussions on issues and options facing our community and will be submitted to the Standing Policy Committee on Environment, Utilities and Corporate Services.

**Public Notice**

Public Notice pursuant to Section 3 of Policy No. C01-021, Public Notice Policy, is not required.

**Attachment**

1. Summary of Updated Indicators

**Report Approval**

Written by: Matt Regier, Environmental Coordinator, Environmental and Corporate Initiatives  
 Reviewed by: Amber Weckworth, Manager of Education and Environmental Performance  
 Brenda Wallace, Director, Environment and Corporate Initiatives  
 Approved by: Catherine Gryba, General Manager, Corporate Performance Department

## Summary of Updated Indicators

### Our Environment



Saskatoon is a thriving, prairie city built around the South Saskatchewan River. The City of Saskatoon (City) is home to a vast urban forest, kilometers of riverbank trails and an abundance of wildlife.

Maintaining a high quality of life where the citizens of Saskatoon can live and grow in harmony with nature requires us to work together and invest in what matters. Our Environment is a tool to help us do this by providing the most recent information on 12 areas related to our land, air, water and waste.

[Our Environment: The City of Saskatoon's 2014 Environmental Leadership Report](#) was the first report of its kind and established a baseline of information indicating the health of our environment and what the City is doing to maintain and improve it. This webpage provides the most recent information on 12 of 44 indicators currently tracked by the City related to our land, air, water and waste. The next full report is anticipated in 2018.

#### Land

The ways we interact with the land can have profound impacts on the health of our environment. These interactions include city-wide choices, such as how our community grows, where we build and how we protect the natural environment and choices we make in our neighbourhoods and homes, such as how we use and take care for our yards, parks and green spaces.

### Air

Canadians are among the top energy users in the world. Per capita, we use more than two times more energy than Europeans and six times more than the world average. While energy use is important to our prosperity from electricity to heating to transportation, the type and amount of energy we are currently using can affect local air quality and contribute to global climate change.

### Water

Saskatoon is fortunate to be situated on the South Saskatchewan River. The river provides an abundant source of fresh water that starts in the Bow and Oldman rivers in Alberta. Saskatoon is the largest city on the South Saskatchewan River, so how we use and treat water, as well as manage storm water and protect our wetlands, will have an impact locally on our water as well as that of our downstream neighbours.

### Waste

The amount of stuff we buy and use is linked to the amount of waste we generate. Items that we use every day, from groceries to the latest electronics have improved our quality of life; however they have also increased and changed the type of waste the City receives through its collection, disposal and recycling services.

## Land

### Ecological Footprint



**Status: Needs Improvement**

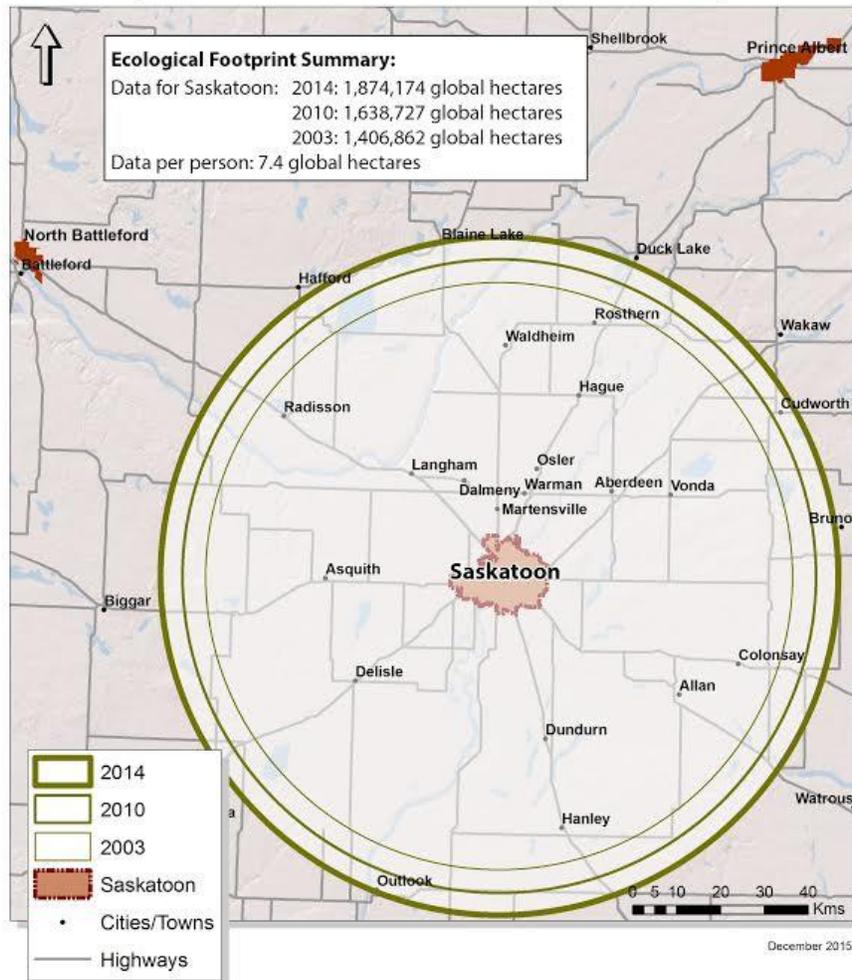
#### **Why is it important?**

The Ecological Footprint is a tool that compares the total resources consumed by a community to the amount of land it would take to support that consumption. The Ecological Footprint is a success indicator in the City's Strategic Plan.

#### **Where are we now?**

In 2014 Saskatoon's Ecological Footprint was 78 times larger than the city's total land area. The average ecological footprint per resident was 7.4 global hectares which was 5% higher than the national average in Canada.

## City of Saskatoon's Ecological Footprint



Source: City of Saskatoon Ecological Footprint Report 2014, prepared for the City of Saskatoon by Anielski Management Inc., December 2015.

### What are we doing?

#### Strategic Plan

The City of Saskatoon has environmental, economic, social and cultural objectives and is tracking progress towards targets.

## **Continuous Improvement**

The City is committed to growing in sustainable ways while improving services and increasing savings. The latest achievements are published in Saskatoon Strides 2015: Our Report on Service, Savings and Sustainability.

## **Environmental Policy**

The City updated its Environmental Policy in 2015. All City employees and contractors are encouraged and expected to be environmentally responsible. As well, the City has the responsibility to facilitate the community at large moving towards sustainability through providing programs and services.

## **Supporting Community Action**

The City has led and partnered on a number of programs to encourage environmental action in the community, including: The Environmental Cash Grant, Student Action for a Sustainable Future, Green Stem, and the Living Green Expo.

## **What can you do?**

Get involved in your city's future by joining a board or committee, sharing your ideas on Shaping Saskatoon, or participating in your neighbourhood Community Association.

Choose products and services that are local, eco-certified or fair trade to reduce your own ecological footprint.

Help green your school or workplace by starting a green team that finds ways to improve environmental performance and save money.

## **Did you know?**

Half of Saskatoon's Ecological Footprint is from the consumption of goods and services (27%) and government services (23%).

## New Development Investment



**Status: Stable**

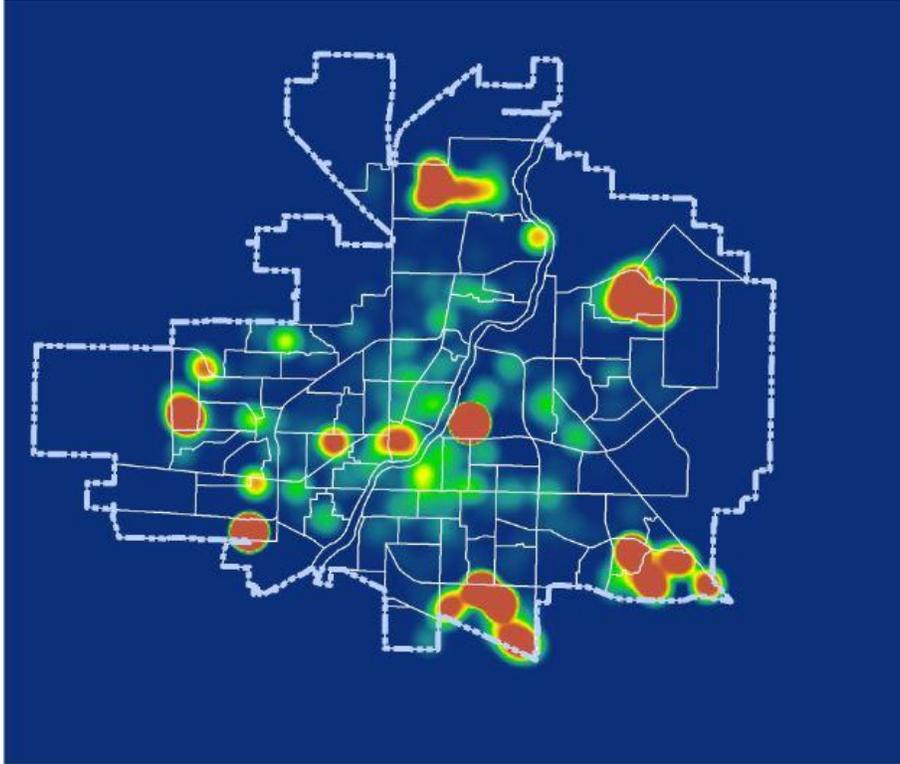
### **Why is it important?**

Saskatoon is growing. The location of new development and the amount that is being invested shows how the City's planning policies are being put into action. A sustainable community experiences growth that is balanced; with new investment in the city centre and strategic infill areas, within established neighbourhoods, and in new neighbourhoods. Balanced growth will conserve natural and agricultural lands, conserve water and energy, and reduce the cost of building new infrastructure like roads, water and sewer lines.

The City's Strategic Goals of Environmental Leadership and Sustainable Growth guide how we grow, and include energy efficiency, responsible land use, orderly and sustainable growth, and balanced land use.

### **Where are we now?**

Investment in new developments is spread throughout the city, with the greatest concentrations in the downtown and new Greenfield communities. In 2015, there were 4,315 building permits with a total value of \$1,018,883,000; \$3,252,000 of this value was for demolition permits. The total value of permits is higher in the red areas and the dark blue area has no values.



Source: City of Saskatoon – Planning & Development

## **What are we doing?**

### **Growth Plan to Half a Million**

The City has completed a plan that will guide future infrastructure investment so that residents will have more choices for how they live and move around as Saskatoon grows over the next 30 to 40 years.

### **Neighbourhood Level Infill Strategy**

Neighbourhood infill describes new homes that are built in established neighbourhoods. The Neighbourhood Level Infill Strategy makes sure that, as these new homes are built, the characteristics of neighbourhoods are maintained.

### **Garden and Garage Suite Regulations**

As part of the Neighbourhood Level Infill Development Strategy, regulations have been developed for small, stand-alone dwelling units that can be constructed on their own or in combination with a detached garage.

## **River Landing**

Construction of new housing is underway by the riverfront edge of downtown and will continue as the City sells additional parcels of land.

## **New Neighbourhood Development**

New neighbourhoods including Evergreen and Aspen Ridge are designed to be less vehicle dependent, align with the sun's rays to be ready for solar power, and include medium-density, mixed-use development.

## **What can you do?**

As the Growth Plan is implemented, there will continue to be communications and engagement. Visit <http://www.growingfwd.ca/> to subscribe for updates.

Use Shaping Saskatoon, Saskatoon's online engagement tool, to learn about current projects and join discussions on the future of our City.

Consider the downtown and strategic growth areas when making your next property investment decision.

## **Did you know?**

Saskatoon's population estimate for July 2015 was 258,068 – an increase of 8.2% since 2012.

## Protected Lands



**Status: Stable**

### **Why is it important?**

The natural, undeveloped areas within our city support a diversity of plants and wildlife, perform “ecological functions” such as reducing and filtering storm water, storing greenhouse gases, removing harmful pollutants from the air, and contribute to our overall well-being and health.

Protected lands are an important part of our natural areas network and help meet the long-term Environmental Leadership strategy in the Strategic Plan to improve access to ecological systems.

### **Where are we now?**

The amount of protected lands in the Meewasin Valley Authority jurisdiction has remained unchanged between 2008 and 2015.

Data Table: Protected Lands

	2003	2008	2014	2015
Hectares of Land in MVA Jurisdiction	6,051	6,278	6,278	6,278
Source: <u>Meewasin Valley Authority</u> .				

### **What are we doing?**

#### **Natural Area Screening**

For suburban development areas the City prepares Sector Plans, which includes a screening study to identify areas with ecological or natural heritage significance. The study is used to reduce the environmental impact of the development’s design and could result in designating land as a Municipal Reserve, an Environmental Reserve or a Meewasin Valley Conservation Area.

## **Northeast Swale**

Saskatoon's Northeast Swale is an ancient river channel and one of the largest pieces of unbroken natural habitat in the Saskatoon region. The City has collaborated with Meewasin Valley Authority to develop a plan to protect this sensitive natural area within the urban context.

## **Wetland Policy**

Saskatoon is located in the Prairie Pothole region and wetlands are found within the city and its surroundings. The City has adopted a policy so that wetlands are inventoried and assessed and that minimizes the impact of development.

## **Natural Areas**

The City has started work on a Natural Area Strategy that will develop an overall vision for natural areas along with a strategy, policy and procedures to conserve and integrate natural areas into urban development.

## **What can you do?**

Enjoy and support the riverside trails, conservation areas, and programs offered by Meewasin Valley Authority.

Help expand the natural areas in your neighbourhood by including native plants in your home garden.

Become a Master Naturalist. The Native Plant Society and the City of Saskatoon have partnered to provide training to for volunteers to work on conservation projects.

Look for volunteer opportunities that support and enhance our natural environment.

## **Did you know?**

The City of Saskatoon has a Naturalization Program for parks that creates valuable habitat in neighbourhoods and reduces costs of irrigation, mowing or fertilizers. The parks with natural areas include Gabriel Dumont, Lakewood, Hyde and Donna Birkmaier Parks.

## Community Gardens



**Status: Improving**

### **Why is it important?**

Growing food in our neighbourhoods provides fresh, healthy food that has a lower environmental impact. Community gardens on public land provide opportunities to grow food for residents that do not otherwise have access to land suitable for gardening.

The number of community gardens is one of the success indicators in the Strategic Plan.

### **Where are we now?**

The number of community gardens on city-owned land is increasing.

Data Table: Community Gardens

	2008	2012	2013	2014	2015
Number of Community Gardens on City of Saskatoon Land	3	13	14	19	23
Source: City of Saskatoon – Community Development					

### **What are we doing?**

#### **Allotment, Community and Vacant Lot Gardening**

There are three ways to access City-owned land for growing food. Residents can rent plots in allotment gardens, community volunteers can form a collective that organizes and maintains a community garden, and non-profit community organizations can apply to use vacant City-owned property to grow food.

## Healthy Yards Demonstration Garden

The City has partnered with the Saskatoon Food Bank & Learning Centre and the University of Saskatchewan Master Gardeners to set up a garden located at the 900 block of 3rd Avenue North to demonstrate a range of healthy and sustainable gardening techniques.

## Saskatoon Food Council

The City is a member of the Saskatoon Food Council, a network of organizations and individuals whose work supports the food system in Saskatoon and the surrounding region. The Council collaborates on food initiatives, provides policy recommendations, and works with citizens of Saskatoon towards the creation of a healthy and sustainable food system.

Saskatoon City Council endorsed the 11 City-related recommendations from the Saskatoon Regional Food System Assessment and Action Plan in 2014 and adopted a Food Charter (in principle) in 2002.

## Boulevard Gardens

Boulevard gardens can create beautiful and diverse streetscapes, add character to neighbourhoods, and increase feelings of community pride and safety. They also increase ecological diversity and create habitat for insects and birds.

Gardening on boulevards adjacent to your home is acceptable, providing you read the City of Saskatoon's Boulevard Gardening & Maintenance Guidelines and complete the Boulevard Garden Agreement.

## What can you do?

Find your local community garden on the City's webpage.

If your neighbourhood doesn't have a community garden, find out how to start a new garden on City land.

If a community garden isn't right for you, learn about the other opportunities to grow food in your community, such as the Saskatoon Food Bank and Learning Centre's Garden Patch or CHEP's Backyard Gardening Program.

Before installing a boulevard garden, please fill out the City of Saskatoon's Boulevard Garden Agreement. This information will be used to track the number of boulevard gardens that are enriching our city.

## Did you know?

Community gardens have been shown to increase neighbourhood property value, reduce crime rates, and reduce the cost of maintaining parkland.

**NEW INDICATOR: Bird Population Count**

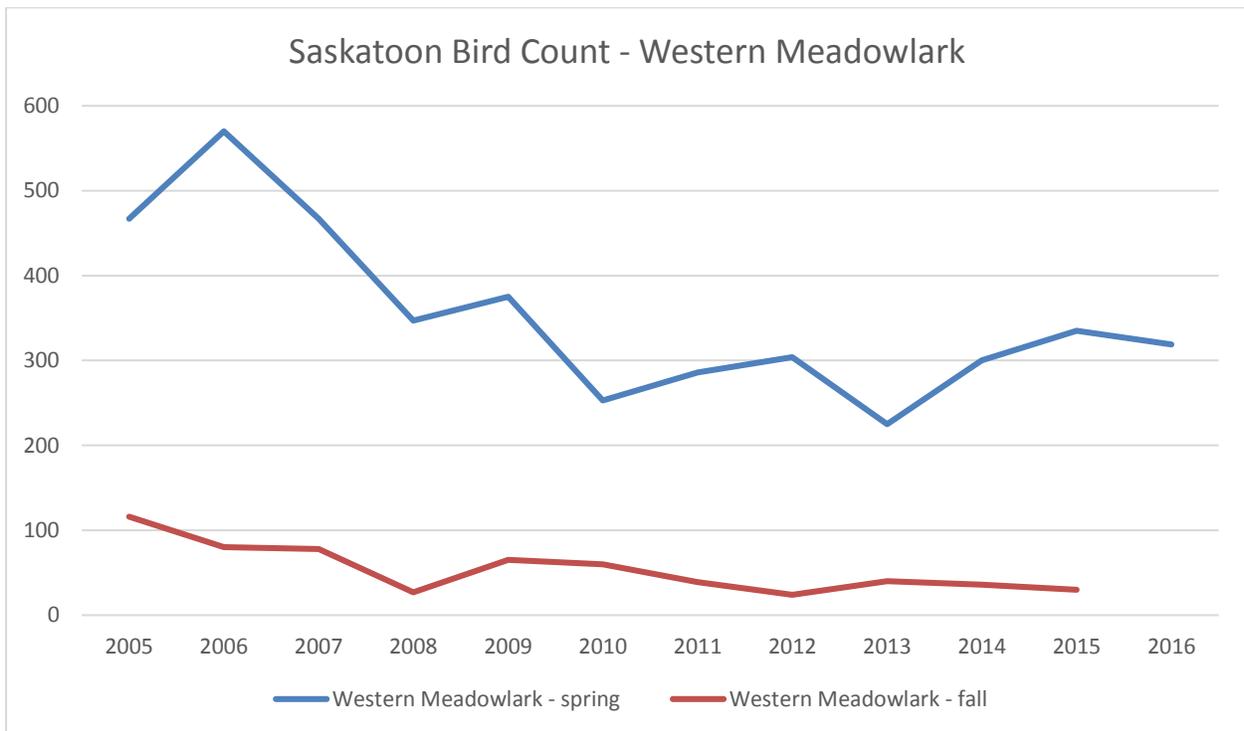
**Status: Stable**

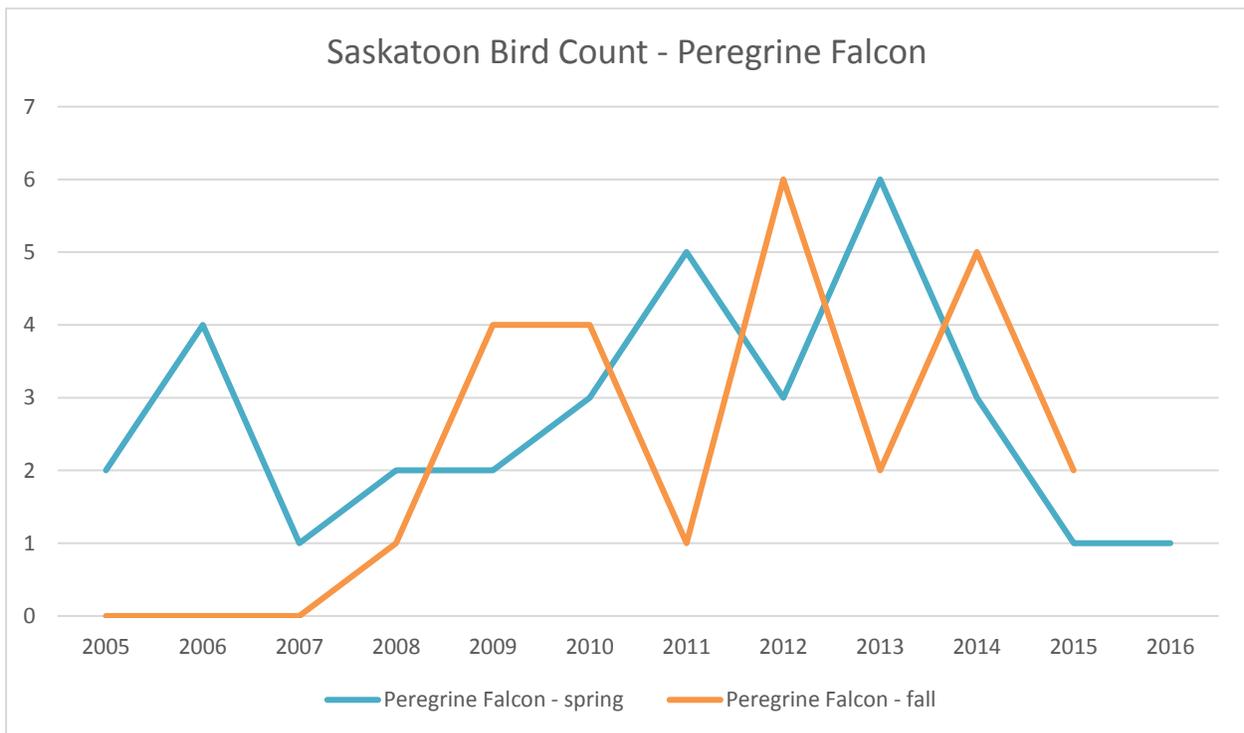
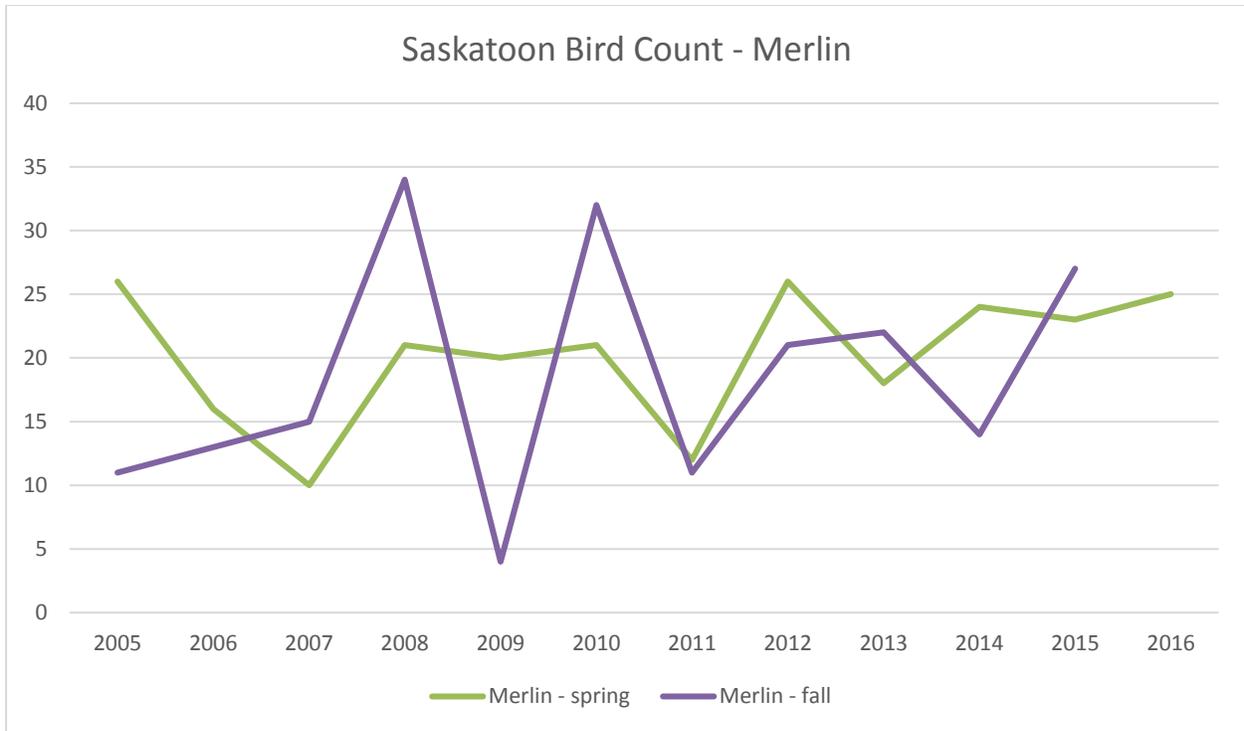
**Why is it important?**

The animals and plants that live within our city are impacted by the decisions we make on how we develop and manage natural and urban areas of our city. Birds play an important role in our urban ecosystem and monitoring their numbers over time can help us to understand the impact we are having on our environment.

**Where are we now?**

Three bird species have been identified to monitor for changes over time. The number of Western Meadowlarks counted have decreased over time, while both the Merlin and Peregrine Falcon counts have improved.





Source: Saskatoon Nature Society, September 2015 Bird Count Report, <http://www.saskatoonnaturesociety.sk.ca/fieldnotes/birdcount-150912.html> and May 2016 Bird Count Report, <http://www.saskatoonnaturesociety.sk.ca/fieldnotes/birdcount-160528.html>.

## **What are we doing?**

### **Wildlife Habitat**

The City of Saskatoon maintains an urban forest with over 105,000 trees located on boulevards, centre medians and parks, providing habitat for wildlife including birds. Grasslands and wetlands also provide important areas of habitat for wildlife within the city.

The Meewasin Valley Authority manages over 2,500 hectares of native grasslands and green spaces within Saskatoon city limits, providing critical habitat for grassland birds.

There are also over 1,000 wetlands within the city, providing critical habitat for birds and various other wildlife. The Wetland Policy guides land use and development decisions related to wetland and riparian areas in a manner that is sensitive to the ecological integrity of these areas.

### **Wildlife Management**

The City of Saskatoon offers wildlife services primarily to trapped, injured and diseased animals as well as contact information for other organizations that can provide assistance.

### **Natural Area Screening**

As part of developing Sector Plans for Suburban Development Areas and Industrial Growth Areas, Natural Area Screening Studies are completed and include an assessment of wildlife and habitat to be considered during future development.

## **What you can do?**

Home owners in new or established neighbourhoods and business owners located in industrial neighbourhoods can request a tree for the City-owned portion of their front and/or side yard.

Volunteer with local groups that are monitoring species and protecting habitat, such as the Saskatoon Nature Society and Meewasin Valley Authority.

Make your property more bird friendly by planting native plants and eliminating the use of pesticides.

Install dark sky compliant light fixtures on your property. Studies have shown that artificial light at night has numerous negative effects on wildlife such as birds, amphibians, insects and mammals.

## Air

### Corporate Greenhouse Gas Emissions



**Status: Needs Improvement**

#### Why is it important?

Greenhouse gases (GHGs) are linked to climate change which is predicted to increase the frequency and intensity of extreme weather events such as droughts, floods and storms. The City of Saskatoon has a role to play in reducing GHGs from its own operations and showing leadership in our community.

The City of Saskatoon has adopted the target to reduce the City's corporate (municipal government) greenhouse gas emissions by 30% from 2006 levels by 2023.

#### Where are we now?

The City's corporate GHG emissions have increased since 2003. A new inventory is being compiled for 2014 emissions.

Data Table: Corporate Greenhouse Gas Emissions

	1990	2003	2006 (est.)	2013 (est.)	2023
Greenhouse Gas Emissions (tonnes CO <sub>2e</sub> )	74,044	91,928	94,700	117,100	
Target					75,000
Source: ICLEI Energy Services, 2005; City of Saskatoon Environmental & Corporate Initiatives					

**What are we doing?****Energy & GHG Management Plan**

As a member of the Partners for Climate Protection Program the City of Saskatoon has completed a greenhouse gas emissions inventory, set an emissions reduction target and developed a local action plan. The City is currently updating its corporate GHG emissions inventory.

**Vehicle Fleet Efficiencies**

On-board global positioning systems (GPS) have been installed on garbage trucks to reduce the number of vehicle kilometers travelled through new routings.

**Green Energy Generation**

The City's projects include solar hot water systems, landfill gas capture and combustion, and combined heat and power generators.

**Greenhouse Gas Inventory and Reduction Business Plan**

The City is in the process of updating its Greenhouse Gas Inventory and developing a plan to reduce emissions from its facilities and operations.

**What can you do?**

When visiting City facilities, do your part to save energy and water, as well as putting waste and recycling in proper bins.

Share your ideas on the best ways to reduce waste and save energy and water as the City consults on its current and upcoming major projects.

**Did you know?**

75% of the City's corporate GHG emissions in the 2013 estimate were generated by City owned buildings and the Water and Wastewater Utilities.

## Community Greenhouse Gas Emissions



**Status: Needs Improvement**

### Why is it important?

Greenhouse gases (GHGs) are linked to climate change which is predicted to increase the frequency and intensity of extreme weather events such as droughts, floods and storms. The emissions from the community as a whole show the combined impact of businesses, institutions and residents.

The City of Saskatoon is in the process of adopting a target for community GHG emissions.

### Where are we now?

The community's GHGs have increased since 2003. A new inventory is being compiled and the Saskatoon Environmental Advisory Committee is selecting a reduction target.

Data Table: Community Greenhouse Gas Emissions

	1990	2003	2006 (est.)	2013 (est.)	2023
Greenhouse Gas Emissions (tonnes CO <sub>2</sub> e)	2,466,239	3,583,339	3,835,648	5,039,944	Target Pending
Source: ICLEI Energy Services, 2005; City of Saskatoon Environmental & Corporate Initiatives					

### What are we doing?

#### **Energy & Greenhouse Gas Management Plan**

The City of Saskatoon's local action plan includes many community-wide programs and actions, including the role of the City to support active transportation, build more sustainable neighbourhoods, and promote energy and water conservation.

### **Smart Meters**

The new Advanced Metering System installed in the Saskatoon Light & Power service area and by Saskatoon Water will record actual power and water usage by time intervals throughout the day, helping residents track their usage and reduce consumption.

### **Customer-Based Generation Programs**

Saskatoon Light & Power offers a net metering program that allows residents to generate their own electricity and use the electrical grid to manage use of that power.

### **What can you do?**

Save money while reducing your GHG emissions by conserving energy and water at home.

When making a purchase, consider energy and water use, which could end up saving you money over the long term.

Recycling and composting result in fewer GHGs than burying that waste in the landfill. Take advantage of the many programs available to Saskatoon residents.

### **Did You Know?**

Climate change scenarios for the Prairie Provinces predict there will be an increase in temperature, a reduction in soil moisture and a higher frequency of extreme weather events such as droughts, floods and extreme temperatures. The City of Saskatoon is considering adaptation strategies.

## Transportation Choices



**Status: Needs Improvement**

### Why is it important?

Transportation impacts the environment, with vehicles generating more GHG emissions and requiring more land for road infrastructure than public transportation, cycling and walking.

### Where are we now?

The percentage of residents using cycling, walking or transit to get to work has been relatively stable since 2001, and needs significant improvement to meet the targets adopted by City Council.

Data Table: Transportation Choices

	1996	2001	2006	2011	2013 <sup>1</sup>	2023
% of Residents Commuting via Cycling, Walking and Public Transit	14.4%	12.4%	12.3%	11.5	14%*	20%
<sup>1</sup> Household Travel Survey includes all trips for all purposes (vs. commute to work only).						
Sources: Statistics Canada and <a href="#">Household Travel Survey (2013)</a>						

### What are we doing?

#### Five-Year Transit Plan

The City has a [new transit plan](#) that will improve customer service, move towards Bus Rapid Transit (BRT), and develop a Control Centre to monitor the entire system and instantly reroute around traffic congestion and detours.

### **Protected Bike Lane Demonstration Project**

Two protected bike lanes are now installed on 23rd Street East and 4th Avenue in Saskatoon's downtown. Lanes are physically separated from vehicles and pedestrians by parked vehicles, a painted buffer and flexible posts.

### **Sidewalk Inventory**

The City of Saskatoon completed a sidewalk inventory in 2015 which will prioritize the repair and replacement of sidewalks throughout the entire city, improving pedestrian safety.

### **Active Transportation Plan**

The City approved the Active Transportation Plan (ATP) in 2016 as part of the Growth Plan to Half a Million. The ATP will help provide more choices for moving around Saskatoon by addressing community infrastructure needs for cycling, walking and other modes of active transportation. The targets set through the Active Transportation Plan expand on the City's initial targets, by doubling the proportion of cycling, walking and transit users to 32% of all daily trips by 2045 (8% cycling, 16% walking and 8% transit).

### **What can you do?**

Visit Saskatoon Transit's route planner to find the best way to get you to work or school.

Find bicycle routes and safety tips using the Saskatoon cycling guide.

Find out if your workplace has a ride share program to promote carpooling and if not consider starting a simple one with a message board or map.

### **Did You Know?**

You can reduce your GHGs by approximately 470kg CO<sub>2</sub>e if you take public transit rather than driving to work, plus you will save on car expenses like fuel, maintenance and parking.

## Air Quality



**Status: Needs Improvement**

### **Why is it important?**

Good air quality is important to our health and the environment. While Saskatoon has many favourable features for good air quality, sources of pollution make ongoing monitoring important.

The Strategic Plan vision statement for Environmental Leadership includes clean air.

### **Where are we now?**

Saskatoon's average Air Quality was ranked as Good by the Air Quality Index in 2014, and has been showing a slow downward trend over the past decade. This means that on average residents with severe respiratory ailments now may notice minor effects, when prior to 2009 the air quality was ranked Excellent and there were no known health impacts.

Data Table: Air Quality Index for Saskatoon

	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Average Air Quality Index	14	14	15	14	15	18	17	16	17	18
Source: Government of Saskatchewan: 2015 State of the Environment Report.										

### **What are we doing?**

#### **Advisory and Education Role**

The regulatory authority for air pollution is with the provincial and federal governments. The City of Saskatoon therefore serves in an advisory and educational capacity.

## **Western Yellowhead Air Management Zone (WYAMZ)**

The City of Saskatoon assists with managing the airshed in which Saskatoon is located. It is the second official air management zone in the province and will result in continuous, real-time air quality monitoring, including monitors in Saskatoon.

### **What can you do?**

Environment Canada recommends monitoring the Air Quality Health Index if you have a respiratory or cardiovascular condition, have young children, are elderly or are active outdoors. This index tracks the pollutants that cause symptoms like eye irritation, coughing and difficulty breathing.

Consider ways to reduce your air pollution such as taking transit, turning your car off instead of idling and planting a lawn that does not require mowing.

### **Did You Know?**

One of the main pollutants that impact Saskatoon's air quality is ground level ozone. It is caused by the reaction of pollutants from industry, electricity generation, and vehicle exhaust with sunlight. The same pollution sources are responsible for greenhouse gas emissions.

## NEW INDICATOR: Corporate Alternative Energy Projects



**Status: Improving**

### Why is it important?

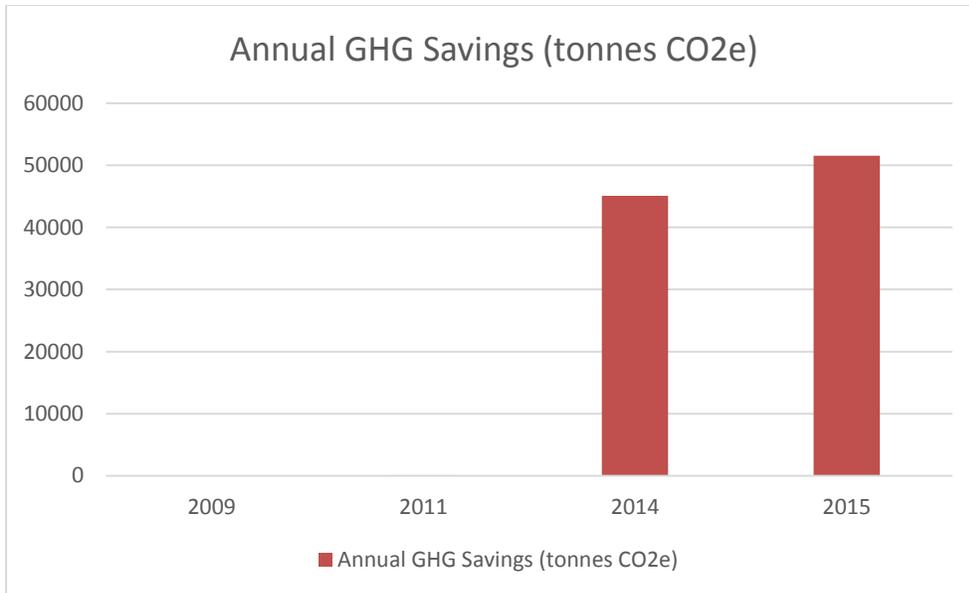
Much of the energy used by the City of Saskatoon in its facilities and operations generate greenhouse gas emissions and air pollution. Developing alternative energy projects can reduce these negative environmental impacts, save money over the long term, and demonstrate leadership in our community.

### Where are we now?

There are currently six completed projects that are using or generating 'greener' energy and offsetting fossil fuel use.

Data Table: Corporate Alternative Energy Projects

Year	# of Projects	Annual GHG Savings (tonnes CO <sub>2</sub> e)
2009	1	6
2011	3	106
2014	4	45,106
2015	6	51,557
Source: Environmental & Corporate Initiatives, City of Saskatoon.		



Source: Environmental and Corporate Initiatives, City of Saskatoon.

### **What are we doing?**

#### **Greenhouse Gas Business Plan**

The City of Saskatoon is developing a plan to reduce GHG emissions in city operations and facilities as well as in the broader community. The plan will include additional projects to reduce GHG emissions.

#### **Solar PV Demonstration Site**

Saskatoon Light & Power is partnering with the [Saskatchewan Environmental Society Solar Co-operative](#) – the first power generation co-operative in the province – and [Saskatchewan Polytechnic](#) to create a Solar Photovoltaic (PV) demonstration site.

#### **Proposed Hydropower Generation at the Weir**

Saskatoon Light & Power is exploring the viability of hydropower generation at the Saskatoon Weir that could generate power for up to 4,800 homes.

### **What you can do?**

Consider alternative energy for your home or business. For example, solar energy systems generate clean, reliable power using FREE fuel (i.e., the Sun) – without producing pollution or CO<sub>2</sub> emissions.

## Water

### Water Quality



**Status: Stable**

#### **Why is it important?**

Water is essential for our health and for our community to prosper. As water passes through our community, the impact can be determined through comparing upstream and downstream water quality.

The Strategic Plan has the long term strategy to reduce the impact of storm water run-off that is going into the river.

#### **Where are we now?**

The South Saskatchewan River upstream and downstream of Saskatoon has consistently averaged Good water quality.

Data Table: Water Quality Index – Upstream and Downstream of Saskatoon

	2005-07	2006-08	2007-09	2008-10	2009-11	2010-12	2011-13	2012-14
WQI (upstream - Outlook)	94.5	94.8	83.3	83.2	83.2	95.2	91.1	90.6
WQI (downstream – West Clarkboro)	90.9	91	91.7	91.7	91.7	84.8	81.8	100

Source: Government of Saskatchewan, Water Security Agency, Annual Report for 2015-16: State of Drinking Water Quality in Saskatchewan

**What are we doing?****Stormwater Management Plan**

The City is in the early stages of developing a plan to protect and monitor water quality and will include the integration of stormwater management with land use planning.

**South Saskatchewan River Watershed Stewards Inc.**

The City is an active member of the South Saskatchewan River Watershed Stewards Inc., a grassroots, community driven non-profit organization working within the watershed to implement programs and initiatives that will protect the water resource.

**Wetlands Policy**

The City has adopted development guidelines to integrate many benefits and functions of wetlands, and meet the strategic goal of reducing the quantity and improving the quality of storm water entering the river.

**Nutrient Recovery Facility**

The City of Saskatoon Wastewater Treatment Plant treats liquids coming from our household plumbing and from businesses across the community. Many pollutants are removed through the sophisticated processes at the plant, including recovering Phosphorus and Magnesium to make a valuable fertilizer.

**Soil Handling Strategy**

The City manages contaminated and clean soils from city construction projects, which helps prevent pollutants from reaching the river.

**What can you do?**

Don't pour harmful household chemicals down the drain. Bring household hazardous waste to a City drop off event.

Use a car wash rather than washing your vehicle at home. Car washes use less water and are designed to keep soapy runoff out of the storm water system that drains directly to our river, harming plant and animal life.

**Did You Know?**

Saskatoon's tap water is safe and healthy with over 55,000 tests per year monitoring quality.

## Water Consumption



**Status: Stable**

### **Why is it important?**

Saskatoon benefits from an abundance of water from the South Saskatchewan River. The treatment of water and waste water, however, use significant energy and chemical inputs, generating environmental and financial concerns as the city grows.

Measuring the per capita water consumption is a success indicator in the Strategic Plan.

### **Where are we now?**

Per capita residential water use improved when new conservation-based water rates were introduced in 2010 and have remained fairly stable over the past 6 years.

Data Table: Residential Water Consumption

	2008	2009	2010	2011	2012	2013	2014	2015
Residential Water Use (L/capita/day)	290	283	230	243	230	234	215	223
Source: City of Saskatoon – Saskatoon Water								

### **What are we doing?**

#### **Be Water Wise**

The City is providing residents, businesses and institutions the education and tools to reduce their water consumption.

#### **Smart Meters**

The City is installing an Advanced Metering Infrastructure system that will provide more accurate water use information to residents and help them find ways to conserve.

### **Rain Barrel Rebate**

Residents can qualify for a \$20 rebate on a newly purchased rain barrel to help save water and reduce their utility bills.

### **What can you do?**

Find out how to use less water on your yard and garden with tips from the Be Water Wise campaign and Healthy Yards.

Consider upgrading your showerhead, toilets, and taps. New water efficient models have been engineered to deliver high performance at the same time as saving you money.

Check your home for leaks. Toilets are the most common cause of wasted water and high water bills.

### **Did You Know?**

Replacing older model toilets with low-flow, low-capacity models can reduce the amount 'flushed' away by up to 65%.

## NEW INDICATOR: Maximum Daily Demand for Water



**Status: Needs Improvement**

### Why is it important?

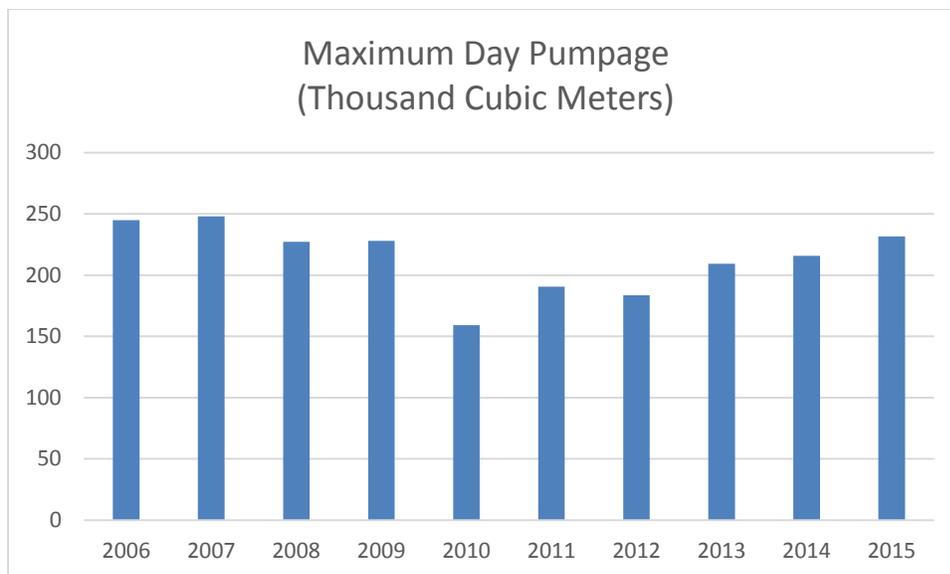
Maximum Day Demand is the largest amount of water pumped by Saskatoon Water on a single day. It has implications for how much water is drawn from the river, the amount of energy used to treat and deliver water to customers, and the future need to build a second Water Treatment Plan. Hot and dry summers and population growth impact how much water needs to be treated and distributed. Daily demand can increase by over 50% in the summer compared to the winter.

### Where are we now?

Maximum day pumpage has been trending upwards since 2010, but remains below levels seen in 2006 and 2007.

Data Table: Maximum Day Pumpage

	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Maximum Day Pumpage (Thousand Cubic Metres)	245	248	227	228	159	191	183	209	216	232
Source: City of Saskatoon – Saskatoon Water, 2015 Annual Report.										



Source: City of Saskatoon – Saskatoon Water, 2015 Annual Report.

### **What are we doing?**

#### **Water and Wastewater Utility Rates**

The City of Saskatoon has conservation-oriented rates to reduce peak water use. For residents this means that higher water use results in paying higher rates. For commercial customers a flat rate is applied based on water use, without a bulk water use discount.

#### **Be Water Wise**

The City's water conservation education program helps educate residents on how to reduce outdoor water use in the summer, which can increase by as much as 50%.

#### **Leading by Example Strategy**

The City of Saskatoon is in the process of developing a strategy to reduce water use in city owned facilities and operations, which includes ways to reduce demands associated with hot, dry summer weather such as irrigation and recreation.

### **What you can do?**

Use the most effective outdoor watering and gardening methods to grow a healthy yard.

Check your home for leaks. Some of the most common source of leaks are toilets, faucets, irrigation systems, and pools.

## Waste

### Landfilled Waste



**Status: Improving**

#### **Why is it important?**

As our population grows the amount of waste we are generating increases and changes. The current landfill has a lifespan of 40 years and the construction of a new landfill would be costly.

Reducing the waste that is landfilled is a priority in the Strategic Plan.

#### **Where are we now?**

The amount of waste each resident sends to the landfill is decreasing.

Data Table: Landfilled Waste

	2007	2008	2009	2010	2011	2012	2013	2014	2015
Residential Garbage Collection (kg/capita)	340	323	308	284	269	265	252	249	242
Source: City of Saskatoon – Environmental & Corporate Initiatives and Public Works									

#### **What are we doing?**

##### **Saskatoon Waste and Recycling Plan**

The City has a 20-year plan to minimize the waste that is landfilled. It focuses on the “5Rs” hierarchy of waste management: reduce, reuse, recycle, resource recovery and residual waste management. The Plan will be updated based on the results of a year-long waste characterization study.

### **National Zero Waste Council**

The City has made a commitment to eliminate waste from the landfill by joining the National Zero Waste Council.

### **Curbside Swap**

The City supports reuse in the community with Curbside Swap events.

### **Recovery Park**

The City is in the process of re-imagining the landfill to include a wider range of options for materials to be reused and recycled.

### **What can you do?**

Reduce the amount of packaging you bring home by buying bulk when possible and using reusable shopping bags.

Reuse items that still have a useful life by buying or selling items second hand, donating items to charity or taking part in a curbside swap.

Repair when possible rather than buying something new.

### **Did You Know?**

Saskatoon has one of the highest rates of residential garbage self-hauled to the landfill in Canada.

## Waste Diversion



**Status: Stable**

### Why is it important?

The amount of material diverted from the landfill can reduce environmental impacts and extend the operating life of the current landfill.

The diversion rate is a success indicator in the Strategic Plan.

### Where are we now?

The percentage of waste being diverted from the landfill has remained relatively stable over the past three years; however, improvement is needed to meet City Council’s 2023 target of 70%.

Data Table:

	2009	2010	2011	2012	2013	2014	2015	2023
Diversion Rate (%)	15%	20%	17%	18%	23%	23%	21%	70%
Source: City of Saskatoon – Environmental & Corporate Initiatives and Public Works								

### What are we doing?

#### **Residential Recycling**

Every resident in Saskatoon can now recycle at home with the curbside recycling program and the multi-unit residential recycling program. The City’s four Recycle Depots are also available for extra or oversized recycling.

## **Household Hazardous Waste Days**

The City hosts a series of events that offers residents a way to safely dispose of household items that are dangerous for waste collectors and can harm the environment.

## **Composting Programs**

The City offers a number of ways for residents to compost, including two compost depots with free drop off, a subscription Green Cart collection program, and a Home Composting Education Program.

### **What can you do?**

Sign up for collection reminders for your black, blue and green carts.

Take advantage of the City's composting programs, including the compost depots and the subscription green cart program that now accepts food waste.

Call a Compost Coach for information on how to compost at home, or train to become a compost coach yourself. Each year the City trains 10-12 new volunteers that help others master the art of composting.

Check to see if something can be recycled before throwing it out by checking the City's Waste Wizard searchable database or the Saskatchewan Waste Reduction Council's "Where do I recycle my..." page. Many common household items such as batteries, lightbulbs, paint, and electronics can be diverted from the landfill.

### **Did You Know?**

In 2015, 29,623 tonnes of materials were diverted through the City's recycling and compost programs.

## NEW INDICATOR: Total Waste Disposal and Diversion



**Status: Improving**

### **Why is it important?**

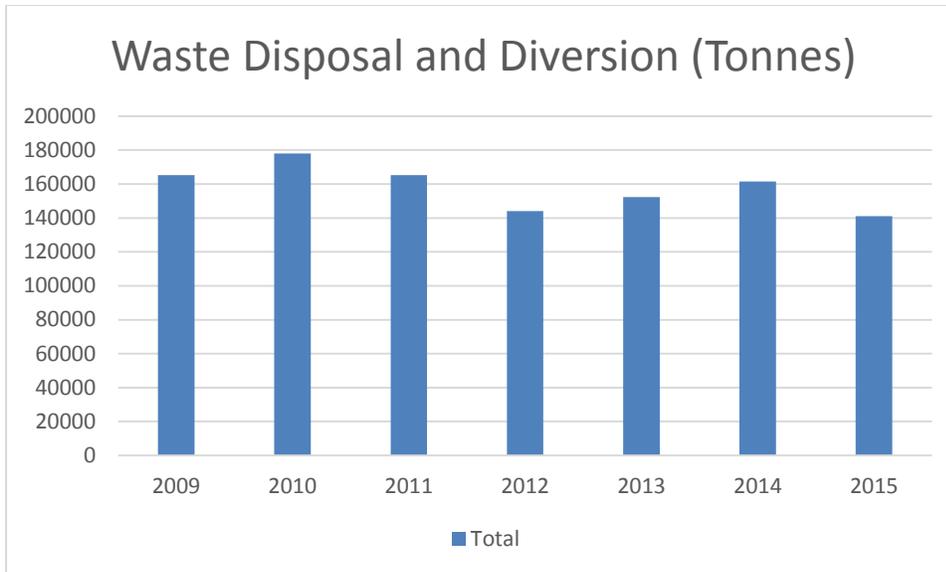
The most environmentally friendly and cost effective way to manage waste is to eliminate it through reduction or reuse.

### **Where are we now?**

The total amount of waste accepted by both the City's diversion and disposal programs was lower in 2015 than 2014.

Data Table: Waste Disposal and Diversion (tonnes)

	2009	2010	2011	2012	2013	2014	2015
Waste Diverted	24,782	34,833	28,557	26,520	34,533	36,338	29,623
Waste Disposed	140,440	143,241	136,735	117,523	117,759	125,238	111,507
Total	165,222	178,073	165,292	144,043	152,292	161,575	141,130
Source: Integrated Waste Management Annual Report, 2015.							



Source: Integrated Waste Management Annual Report, 2015.

## **What are we doing?**

### **Home Composting Education Program**

Composting is the process of breaking down organic waste (such as food scraps, grass clippings, and dried leaves) into a rich soil amendment that your lawn and garden will love!

Have a composting question? Simply dial (306) 931-3249 or email [compost@saskwastereduction.ca](mailto:compost@saskwastereduction.ca). Please allow 1 business day for one of our Compost Coaches to respond to your inquiry.

### **Curbside Swap**

The City supports reuse in the community with Curbside Swap events.

## **What you can do?**

When making a purchase, consider the packaging, how easy a product is to repair, and what disposal options are available.

Find out what your composting style is by taking an [online quiz](#). Compost coaches are available for a home visit if you have questions, need help setting up your home compost system or are troubleshooting an issue.

Donate lightly used items to charities. Charity bins for Canadian Diabetes Association, Community Living, and The Salvation Army are located at three of four City-run recycle depots as well as other locations throughout the city.

**Green Cart Program**

NEW in 2016: food waste is accepted with yard waste in the Green Cart program.

**Did you know?**

Yard and food waste make up over 40% of the waste from an average home. Composting these materials diverts waste from the landfill and reduces greenhouse gas emissions.

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# Environmental Sustainability Plan

## Recommendation

That a report be submitted to City Council recommending:

1. That the Administration proceed to develop an Environmental Sustainability Plan utilizing the process as described in this report.

## Topic and Purpose

The purpose of this report is to outline a process for developing a long term, integrated plan for Environmental Sustainability.

## Report Highlights

1. The City of Saskatoon (City) has a wide variety of environmental initiatives but no comprehensive plan that connects them into a broader strategy. There is an opportunity to develop a sustainable community plan utilizing four pillars: Sustainable Land-Use & Transportation, Waste Diversion, Energy & Climate, and Environmental Protection.
2. A number of environmental performance reports have been prepared and highlight that more can be done to improve environmental outcomes in Saskatoon.
3. There is an opportunity to engage the public in the planning process on each of the four pillars. This could be achieved by hosting an Environmental Summit to kick-start a coordinated engagement on:
  - Implementing the Growth Plan to Half A Million
  - Preparing strategies to achieve the Waste Diversion Performance Target
  - Plan for Mitigating Climate Change
  - Renewable Energy Strategy
  - Green Infrastructure Strategy, including regional studies.
4. The input from the public, and the priorities identified by City Council would drive the development of the Environmental Sustainability Plan, and it would be implemented through the Business Plan and Budget process.

## Strategic Goals

Civic plans for protecting our environment respond directly to the Strategic Goal of Environmental Leadership. The various environmental initiatives planned by the City also make a positive contribution to the achievement of other goals such as Continuous Improvement. These initiatives contribute toward the Vision for Saskatoon as a great place to live, where sustainable growth enables the community to invest for the benefit of all.

### **Background**

On September 15, 2014, the Standing Policy Committee on Environment, Utilities and Corporate Services received a report outlining the City's Environmental Performance Plan. This Plan categorized current and planned environmental initiatives into the categories of waste diversion, energy efficiency, green energy generation, and environmental protection.

The Growth Plan to Half a Million was adopted in principle by City Council on April 25, 2016. This Plan outlines sustainable land-use and transportation strategies that will also significantly reduce environmental impact.

### **Report**

The Administration is recommending a three phased approach on developing the Environmental Sustainability Plan:

1. What is the data telling us
2. What are the issues and options
3. Recommendations that would formulate the Environmental Sustainability Plan

### Data

A number of important environmental performance reports are being tabled with this report:

- Our Environment – 2016 Update
- City of Saskatoon Ecological Footprint 2014 Report
- Annual Report on Environmental Protection
- Saskatoon Greenhouse Gas Inventory and Update on Compact of Mayors

A comprehensive Community Waste Characterization Study will be provided in the next couple of months and the 2015 Integrated Waste Management Annual Report was also tabled in May of this year.

This data supports all four pillars, but is currently in a format that is quite detailed and very comprehensive.

In early 2017, this data will be reported at a higher level and organized under each pillar. The data and related analysis will provide the context for the discussions on the issues and options facing our community.

### Issues and Options

These various reports highlight that Saskatoon's environmental performance is declining as demonstrated by (among other trends):

- As outlined in the 2014 Saskatoon Ecological Footprint report, the City's per capita Ecological Footprint grew 1.4% between 2010 and 2014 and is now 78 times larger than the geographic area of the city, indicating our consumption demands far exceeded the City's ability or capacity to produce the materials we used and to absorb the waste we generated.

- In the 2015 Integrated Waste Management Annual Report, it was highlighted that Saskatonians continue to dispose less waste than the national average (which includes rural areas), but at a rate higher than most Canadian cities at 242 kilograms per person. The 2015 rate is 21%, below the national average (2012) of 33.7% and down from the 2013 rate of 22.7%

In addition, Saskatoon is experiencing rising community expectations with regards to environmental performance as demonstrated by:

- Delegation from the Saskatchewan Citizens' Hearing on Climate Change
- Saskatchewan Environmental Society (SES) presented a Municipal Greenhouse Gas Emissions Reduction Strategy to the City.
- Saskatoon Environmental Advisory Committee (SEAC) recommended that a Community Emissions Reduction Performance Target be established.
- Various presentations from individuals.

Federal and Provincial governments are also focusing on stronger environmental protection measures as demonstrated by:

- Sections of a new Saskatchewan Environmental Code came into force in June 2015 including new requirements for addressing contaminated soil, testing drinking water, dealing with specific chemicals, and identified qualifications required among those working in certain positions within the environmental field.
- The Federal Government has made greenhouse gas emissions a focus of a new \$75M fund through the Federation of Canadian Municipalities (FCM) and has suggested they will mandate the pricing of carbon across the country to ensure international commitments to emissions reductions are achieved.
- The Provincial Government has committed that SaskPower will utilize 50% renewable energy by 2030 and intends to issue a call for proposals for community power projects in late 2017/early 2018 (with consultations expected in early 2017).

### Responding With Action - Environmental Sustainability Plan

The analysis of the data, and consideration of issues and options will provide the context for the Environmental Sustainable Plan. This will be a comprehensive and integrated plan that will outline the course of action required to address the issues and achieve the performance targets.

A wide variety of environmental initiatives are currently underway. Attachment 1 illustrates how these initiatives fit into four pillars that could become part of the future Environmental Sustainability Plan.

### **Public and/or Stakeholder Involvement**

#### Environmental Summit

Given the vast array of initiatives and large volume of information available to give context to future community conversations, the Administration is proposing to host an Environmental Summit in association with Earth Day (April) in 2017.

The Summit format will include information stations related to the four pillars, a provocative keynote speaker, and opportunities for citizens to discuss and share ideas using a world café format. The Summit could be held at a community location such as a high school to encourage people of all ages to take part.

Citizens will have an opportunity to make presentations and share ideas that may be used in the development of the Environmental Sustainability Plan.

Opportunities for public and stakeholder engagement throughout 2017 will be outlined in an Engagement and Awareness Plan to coordinate efforts under the four pillars from a strategic perspective and moves Saskatoon towards an integrated Environmental Sustainability Plan.

In 2017, a number of environmental planning initiatives that include community engagement have been built into the City's work program. Attachment 2 highlights these plans. Together, these planning initiatives will help form the basis of a comprehensive sustainable community plan.

### **Communication Plan**

A comprehensive environmental sustainability awareness campaign will be developed as part of the Engagement and Awareness Plan to support environmental planning initiatives. A webpage will also be developed on the City's website to provide ongoing information support to engagement activities leading up to and following the Summit

A background document that summarizes key environmental trends and indicators will be prepared based on the various information reports tabled over the last year. An Engagement and Awareness Plan will be developed to ensure the planning initiatives listed in Attachment 2 are coordinated and supported by information that is broadly available. The goal is to provide citizens with a voice in identifying options based on trends and engage to share feedback on which options are turned into recommendations for action.

### **Other Considerations/Implications**

There are no policy, financial, privacy or CPTED implications or considerations.

### **Due Date for Follow-up and/or Project Completion**

The Administration will table the results of the Community Waste Characterization Study in February 2017. If the recommendations of this report are approved, Administration will also provide a summary data report, further details on the Environmental Summit, and an Engagement and Awareness Plan to support environmental planning in 2017 to the Standing Policy Committee on Environment, Utilities and Corporate Services at that time.

### **Public Notice**

Public Notice pursuant to Section 3 of Policy No. C01-021, Public Notice Policy, is not required.

**Attachments**

1. Current Environmental Initiatives
2. Environmental Planning Initiatives

**Report Approval**

Written by: Brenda Wallace, Director of Environmental and Corporate Initiatives

Reviewed by: Lesley Anderson, Director of Planning and Development

Approved by: Catherine Gryba, General Manager of Corporate Performance Department

Environmental Sustainability Plan.docx

## Current Environmental Initiatives

### Sustainable Land-Use and Transportation Initiatives

- Growth Plan to Half a Million
  - Strategic Infill plans for North Downtown, University lands, City Centre, and River Landing
  - Corridor Growth (includes Complete Streets policy, plans for 8<sup>th</sup> Street, Preston Avenue, 22<sup>nd</sup> Street, Idylwyld Drive, Holmwood Suburban Centre and Confederation Suburban Centre)
  - Bus Rapid Transit plan, Transit service enhancements (including customer service and priority treatments)
  - Road Network enhancements including a core area bridge
- Neighbourhood Infill Development Strategy
- Employment Areas Study
- Active Transportation Plan
- Transportation Demand Management Plan
- Community Gardens and Regional Food Strategy
- Local Area Plan recommendations

### Waste Diversion (Integrated Waste Management) Initiatives

- Saskatoon Waste Characterization Study
- Waste Diversion Plan
- Curbside Recycling (delivered by Loraas Recycle)
- Multi-Unit Recycling (delivered by Cosmopolitan Industries Ltd.)
- Recycling Depots
- Public Space Recycling
- Drop-off Compost Depot sites
- Green Cart program
- Household Hazardous Waste Days program
- Recovery Park
- Mandatory Paper and Cardboard recycling (landfill ban)
- Civic recycling
- Waste Education (includes annual Collection Calendar, Rolling Education Unit, Home Compost education program, and marketing initiatives with recycling contractors)
- Saskatoon Curbside Swap

### Energy and Climate Initiatives

- Climate Change Adaptation Plan
- Saskatoon Greenhouse Gas Emissions Inventory
- Climate Change Mitigation Plan
- Solar Strategy

- Civic water and energy reduction initiatives (includes Energy Performance Contracting, Water Conservation, Energy Management program, and advisory services in planning new facilities)
- Civic green energy initiatives (includes Green Energy Park, solar panels on pools, and Combined Heat and Power (CHP) installations)

### **Environmental Protection Initiatives**

- Source Control Programs and regulation of sanitary sewer use
- Lead Service Line replacements and Corrosion Control program
- Brownfield Renewal Strategy and Soils Handling Strategy
- Green Infrastructure Strategy (includes Wetlands Policy implementation, Natural Area Strategy, Stormwater Management Plan, and Natural Capital Asset Valuation)
- Participation in regional air quality management through Air Zone
- Participation in regional water management through Watershed
- Civic spill response
- Sustainable Procurement and contractor guidelines
- Civic advisory services (includes education and training of civic staff, project advisory and review, City regulatory reporting, Landfill soil acceptance, and environmental records management)
- Environmental Education initiatives (includes Student Action for a Sustainable Future program, Healthy Yards campaign, etc.)
- Environmental Cash Grant

## Environmental Planning Initiatives

In 2017, the following planning initiatives, including community engagement, have been built into the City's work program:

- Sustainable Land-Use/Transportation
  - Plans for implementing Bus Rapid Transit and Corridor Growth will be developed under the Growth Plan to Half a Million. This work presents a significant opportunity to reduce the Ecological Footprint of the community as well as greenhouse gas emissions.
- Waste Diversion
  - A comprehensive study of all waste generated in Saskatoon is nearing completion and will form the basis for a complete review of the City's Waste Services including the development of a Waste Diversion Plan that will identify the most efficient and cost-effective methods for achieving the Performance Target to increase waste diversion to 70% by 2023. Methods may include expanded organics programs, material bans from the landfill, expanded recycling options (e.g. Styrofoam), and increasing the use of utility fees for other aspects of waste management. Community engagement will inform the implementation plan to provide residents, businesses and waste industry stakeholders an opportunity to influence the order and timing for introducing new policies and programs.
- Community Energy
  - The City is a signatory to the Compact of Mayors, committing to complete a greenhouse gas inventory within one year, to set a community emissions reduction target and identify local climate change hazards within two years, and to adopt plans to reduce greenhouse gas emissions and adapt to climate change risks within three years. A Community Greenhouse Gas Emissions Inventory is now complete. Administration will consult with the Saskatoon Environmental Advisory Committee (SEAC) and the Saskatchewan Environmental Society to recommend a Performance Target for Community Emissions Reduction.
  - The role of the City to facilitate community greenhouse gas emissions reduction will be identified in a business plan (Climate Change Mitigation Plan) that outlines the plans, policies, programs, pilot projects and infrastructure investments that will achieve the Performance Target. The development of the Plan will involve community and stakeholder engagement.
  - A Renewable Energy Opportunities discussion paper is being prepared stakeholders from solar industries (in particular) will be consulted.
- Environmental Protection
  - A Green Infrastructure Strategy that considers the value and utility of a network of natural areas in the context of biodiversity and watershed protection, storm water management and adaptation to climate change is underway. A series of workshops are planned.
  - The Saskatoon North Partnership for Growth Regional Plan, currently in preparation, has also identified a Green Network Study Area that includes

connected areas of wetlands, river corridors, and swales that provide stormwater conveyance, storage and assist in groundwater recharge. This area will help manage regional stormwater and minimize property damage during flooding events.

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## Environmental Protection Annual Report 2015

### Recommendation

That the report of the General Manager, Corporate Performance Department, dated December 6, 2016, be received as information.

### Topic and Purpose

Corporate environmental protection activities have been summarized in this inaugural Environmental Protection Annual Report for 2015.

### Report Highlights

1. An inaugural Environmental Protection Annual Report for 2015 has been prepared. The report provides a description of the corporate-level environmental protection activities that were undertaken in that year and key outcomes of these initiatives.
2. Environmental Protection staff within the Environmental and Corporate Initiatives Division are proactive in promoting corporate regulatory compliance and implementation of best practices for soil, water, and air quality management in the City of Saskatoon (City).
3. Projects, programs, and services delivered by Environmental Protection are relevant to all operations and projects of the corporation.

### Strategic Goal

Environmental Protection activities support the strategic goal of Environmental Leadership by working toward compliance with environmental regulation, stimulating collaboration among civic staff, and encouraging implementation of good operating practices. The 10-year strategies to improve the quality and reduce the quantity of storm runoff, and to address soil quality issues on city-owned properties are specifically addressed. Work also aligns with the four-year priority of waste diversion for beneficial reuse within City projects.

Environmental Protection initiatives also support the strategic goal of Asset and Financial Stability by ensuring that our assets are well managed and maintained. The goal of Continuous Improvement is addressed by modernizing policy and operations to reflect best practices and changing demands.

### Background

This is the first annual report of Environmental Protection activities that has been produced by the Administration.

## Report

### Inaugural Report

Attachment 1 is an inaugural Environmental Protection Annual Report for 2015. The report provides a description of the corporate-level environmental protection activities that were undertaken in that year and key outcomes of these initiatives. Projects, programs, and services delivered by Environmental Protection are relevant to all operations and projects of the corporation, specifically when environmental issues regulated by other levels of government are involved.

Environmental Protection services are provided via two main activities:

- Providing support to city operations and projects that deal with contaminated soils, street sweepings, spills, solid waste, sanitary waste, snow, groundwater, stormwater, wetlands, migratory birds, and natural resource management.
- Developing programs and projects that address corporate liability/due diligence regarding compliance with current and future environmental regulation.

### Support Services

Support services provide the corporation with central access to specialized environmental knowledge and expertise. This increases corporate environmental knowledge, reduces corporate risk, promotes consistency in the city's approach to environmental issues, and reduces reliance on external consultants.

Support services provided in 2015 are described in Attachment 1.

### Projects and Programs

Projects and programs are also developed by Environmental Protection staff to integrate, coordinate, and create up-to-date approaches to municipal operations that have an environmental component. As such, projects and programs intentionally create opportunities for cross-corporate collaboration on environmental and public health issues.

Protection of the soil, water, and air quality within our watershed is key to the health of our environment and the quality of life of our citizens. Environmental Protection projects and programs that were under development in 2015 are shown in the table below and described in Attachment 1.

<b>Water</b>	<b>Soil</b>	<b>Air</b>
Corrosion Control Program: Lead Service Lines	Soil Handling Strategy	Air Quality Management
Sewer Use Bylaw		
Source Control Programs for the Sanitary Sewer		

Water	Soil	Air
Corporate Spill Response		
Stormwater Management Plan		
Watershed Protection		

**Communication Plan**

The Environmental Protection Annual Report for 2015 will be available for viewing on the City’s website.

**Environmental Implications**

Environmental protection implications are included in the annual report.

**Other Considerations/Implications**

There are no policy, financial, privacy, or CPTED implications or considerations.

**Due Date for Follow-up and/or Project Completion**

An Environmental Protection Annual Report will continue to be produced each year. In early 2017, the data from this report will be included in a higher level document representing the four pillars of an Environmental Sustainability Plan. The data and related analysis will provide the context for discussions on issues and options facing our community and will be submitted to the Standing Policy Committee on Environment, Utilities and Corporate Services.

**Public Notice**

Public Notice pursuant to Section 3 of Policy No. C01-021, Public Notice Policy, is not required.

**Attachment**

1. Environmental Protection Annual Report 2015

**Report Approval**

Written by: Twyla Yobb, Environmental and Corporate Initiatives  
 Reviewed by: Brenda Wallace, Director of Environmental and Corporate Initiatives  
 Approved by: Catherine Gryba, General Manager, Corporate Performance Department

# Environmental Protection Annual Report 2015



# 1 Introduction

Clean water, soil, and air are crucial to the health of the environment we live in and, ultimately, to the long term health of our residents and community. As time passes and our city grows, our understanding of how to maintain a good quality environment changes, and this is reflected in changes to the way we manage our city.

## 1.1 What is Environmental Protection?

Environmental Protection activities preserve the quality of our water, soil, and air now and for future generations by safeguarding our community from the impacts of pollution. The minimum standard for effective environmental protection is compliance with federal and provincial environmental regulation. City of Saskatoon (City) programs and projects must all consider how to best integrate with current and future environmental regulation while remaining cost effective and practical to implement.

## 1.2 Purpose

The purpose of this report is to provide information about corporate-level Environmental Protection initiatives that:

- Ensure civic operations maintain compliance with changing environmental standards;
- Monitor best practices in managing risks that have environmental implications;
- Incorporate best-practice approaches into future plans; and
- Attempt to respond to some of the environmental trends reported in the 'Our Environment' report.

## 1.3 Delivering Environmental Protection Services

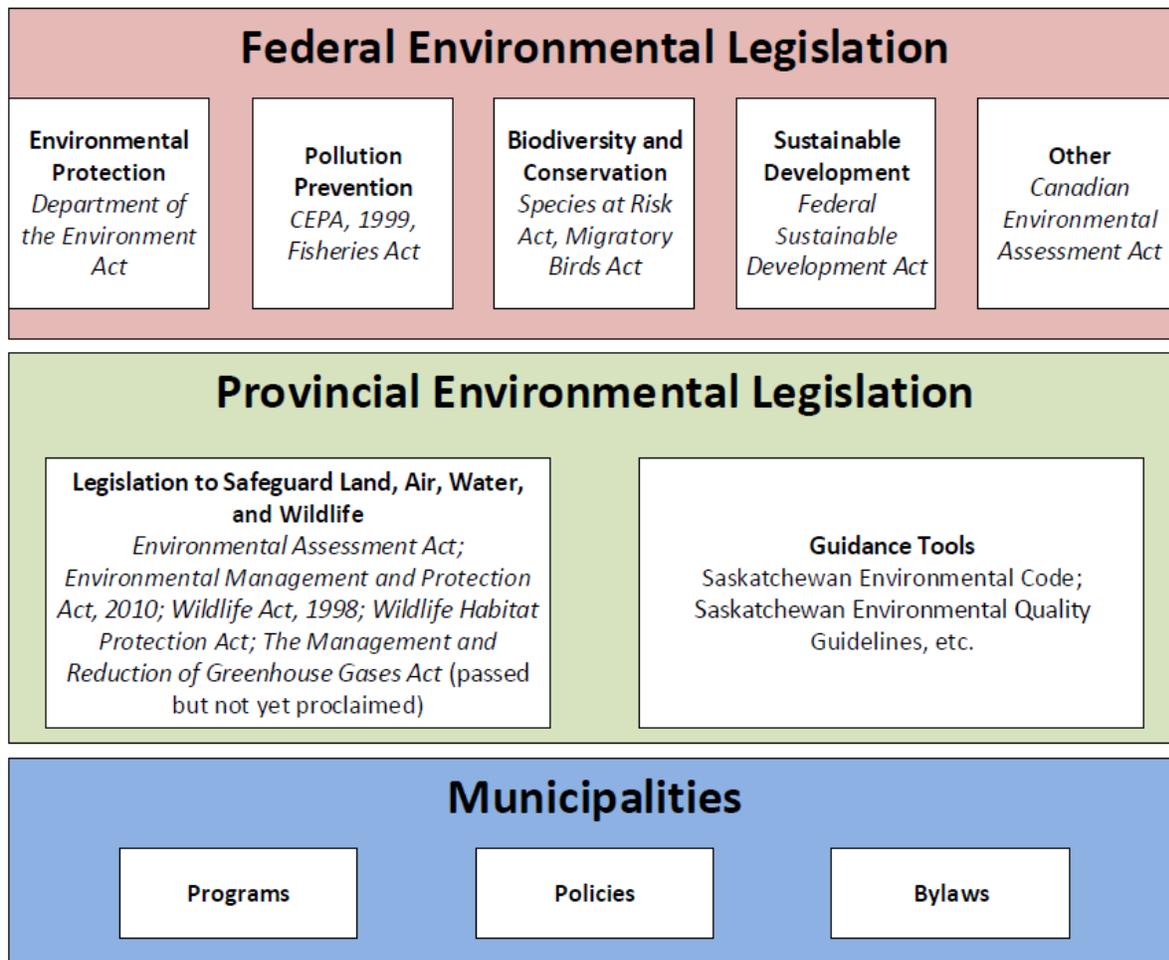
Environmental Protection is a shared responsibility and is led by the Environmental & Corporate Initiatives (E&CI) Division with resourcing through the Environmental Health Business Line. Operational groups such as Parks, Water & Waste Stream (previously Public Works), the Fire Department, and the Utilities also protect natural assets, water, soil, and air quality in their daily operations and report environmental protection-related activities in various documents prepared by each operation.

The Environmental Protection Section includes a Manager, two Project Engineers, and one Environmental Protection Officer; supported by Business Administration and Communications staff.

Environmental Protection work is undertaken in a consultative, collaborative fashion. Environmental expertise is available to all divisions, civic projects and operations through advisory services, liaising/coordinating with consultants and regulators, participation in steering or review committees, and some project management services.

## 2 Environmental Regulation in Canada

The full suite of environmental legislation in Canada is illustrated in the diagram below.



The *Canadian Environmental Protection Act, 1999* (CEPA) is the backbone of the federal legislative framework for protection of the environment and public health. CEPA focuses on the prevention and management of risks posed to water, soil, and air quality by harmful substances. The Minister of the Environment and the Minister of Health jointly administer the assessment of substances for toxicity and the subsequent development of risk management strategies.

Work carried out under CEPA is complemented by other acts that focus on protection of wildlife (e.g. fish, migratory birds, etc.) and natural assets that contribute to our overall well-being.

The *Environmental Management and Protection Act, 2010* (EMPA) is the main provincial legislation for protecting the water, land, and air resources of the province.

Other acts and regulations address protection of natural assets and sensitive environments. The City has a number of programs within Saskatoon Water and the Parks Division to respond directly to these requirements.

Municipal policy and bylaws influence day-to-day human behaviour. Municipalities therefore play a key role in regulating and delivering programs to reduce and eliminate toxic substances and generally protect the environment. The City works to align its programs with federal and provincial initiatives to provide a consistent and coordinated approach to the management of harmful substances and sensitive environments.

## **2.1 The Canadian Council of Ministers of the Environment (CCME)**

The CCME is an intergovernmental organization that includes environment ministers from the federal, provincial, and territorial governments. These ministers set strategic direction for action on environmental issues of national and international concern. Based on the broad outcomes defined by the Ministers, CCME working groups collaborate to accomplish specific goals. These working groups include experts from relevant government departments and may also include expertise from the private sector, academia, aboriginal groups, and environmental and public health interest groups.

Current CCME working groups are:

- Water Management Committee
- Waste Management Task Group
- Soil Quality Guidelines Task Group
- Climate Change Committee
- Air Management Committee

The guidelines established by the CCME are used by the City to inform decisions about environmental protection.



*Wetland.*

## **2.2 Taking Action**

The Environmental Protection Section acts as a forward-looking conduit for corporate regulatory compliance and implementation of best practices for soil, water, and air quality management in the City of Saskatoon.

Projects, programs, and services delivered by Environmental Protection are relevant to all operations and projects within the corporation that deal with environmental issues regulated by other levels of government.

In 2015, Environmental Protection services were provided via two main activities:

- Providing support to civic operations and projects that deal with contaminated soils, street sweepings, spills, solid waste, sanitary waste, snow, groundwater, stormwater, wetlands, migratory birds, and natural resource management.
- Developing programs and projects that address corporate liability/ due diligence regarding compliance with current and future environmental regulation.

**Support services** are intended to provide the corporation with central access to specialized environmental knowledge and expertise. This increases corporate environmental knowledge, reduces corporate risk, promotes consistency in the city's approach to environmental issues, and reduces reliance on external consultants.

The intent of the **projects and programs** undertaken by Environmental Protection staff is to develop integrated, coordinated, and up-to-date approaches to municipal operations that have an environmental component. As such, projects and programs intentionally create opportunities for cross-corporate collaboration on environmental and public health issues.

### **2.3 Key Outcomes**

Environmental protection initiatives are developed to achieve the following three key outcomes:

- Ensure the City of Saskatoon plans for regulatory compliance and avoids compliance orders.
- Minimize costs by maximizing coordination and management in the handling of substances of concern to environmental and health regulators.
- Build capacity of civic staff through education and collaboration.

### 3 Support Services

In 2015, Environmental Protection activities included the following support services:

- Internal Education and Training
- Civic Project Advisory and Review
- City Regulatory Reporting
- Landfill Soil Acceptance
- Spill Response
- Sanitary Sewer Use
- Environmental Records Search
- Public Enquiries and Complaints
- Civic Program and Project Development

#### 3.1 Internal Education and Training

Environmental Protection staff stay updated on environmental regulations and current environmental best practices and then share this knowledge with civic staff through training and information sessions on these topics. Sessions currently available include:

- The Environmental Assessment Process (corporate-wide)
- Discharge and Discovery Reporting (corporate-wide)
- Spill Response (for fleet operations)
- Landfill Soil Acceptance (for landfill operations)

Service Provided	Metric	2014	2015
Education and Training	Number of attendees	24	66

**Service Status:** In 2015, these sessions were provided in advance of the declaration of the provincial Environmental Code, and/or upon request by specific work groups. Future plans for this service include incorporating the two corporate-wide sessions into the annual corporate training calendar.

#### 3.2 Civic Advisory, Review, and Management

General environmental advisory services are available for document and report review, participation in steering or review committees, and liaison with consultants and regulators. Project advisory services have been provided for the following major initiatives:

- **North Commuter Bridge:** Environmental Protection staff sat on a Division Coordination Committee during the planning of the North Commuter Parkway project. This included reviewing and providing any feedback regarding

environmental matters that arose during the planning process. Interpretation of consultant reports was also provided to the project manager.

- **Saskatoon Transit Facility** (Caswell Hill Bus Barns): An environmental assessment was completed on the Saskatoon Transit Facility in anticipation of its future redevelopment following the transfer of operations to the new Civic Operations Centre in 2017. Phase I and Phase II Environmental Site Assessments were completed on the site. Environmental Protection staff reviewed all pertinent consultant reports and interpreted the information for Planning and Development in order to ensure that the involved staff clearly and thoroughly understood the content and implications of the environmental results so they could communicate effectively and confidently to the affected community.



*Contaminated soil at a construction site.*

- **Saskatoon Land:** Environmental requirements are common when dealing with land acquisition, sales, and transfers. Environmental Protection staff have provided environmental advisory and services to Saskatoon Land to help facilitate these requirements. The main support that Environmental Protection staff provided in 2015 included developing documents to achieve site closure from the Ministry of Environment (thus enabling land to be sold or developed), liaising with regulatory officials, working with external consultants to achieve project goals and to ensure that the City is provided with accurate information, and data interpretation.
- **Nature Conservancy Canada/Meewasin Valley-Wide Resource Plan:** The Meewasin Valley Authority and the Nature Conservancy of Canada partnered in 2015 to create a management plan for the conservation of biodiversity along the river valley and in proximity to Saskatoon. Environmental Protection staff

participated in initial workshops to scope the plan, and sat on the Technical Advisory Committee for the project.



*Saskatchewan biodiversity.  
Photos courtesy of the South Saskatchewan River Watershed Stewards, Inc.*

Service Provided	Metric	2014	2015
Project Advisory and Review	Number of projects	15	31
Project Management	Number of projects	0	1

**Service Status:** The success of this service is partly attributable to the fact that resourcing was available to various civic operations and projects ‘free of charge’ and fully-resourced through capital project 2052 – Contaminated Soils Handling in 2015. The service is now provided to each internal work group on a cost recovery basis utilizing temporary staff resources and this may have a negative impact on both service utilization and environmental implications.

### 3.3 City Regulatory Reporting

Environmental Protection staff act as the City’s account administrator for federal and provincial web-based reporting:

**Federal:** Environment Canada’s Single Window Information Management (SWIM)

- **Wastewater Effluent System Effluent Regulations (WSER):** This is a federal wastewater regulation which came into effect in 2012 under *The Fisheries Act* to establish minimum effluent quality standards that can be achieved through secondary wastewater treatment. Requirements in the regulation include monitoring, record-keeping, reporting and toxicity testing. The wastewater treatment plant reports to the WSER quarterly.
- **National Pollutant Release Inventory (NPRI):** The NPRI was established under *The Canadian Environmental Protection Act, 1999* (CEPA) which allows the Minister of Environment and Climate Change to require the reporting of substances released by industrial, institutional, and commercial sectors into the air, land, and water of their communities. The program facilitates the identification of where regulatory or other action is needed. Reporting to the NPRI is due annually; in 2015 three civic

facilities reported to the NPRI (water treatment plant, waste water treatment plant, biosolids handling facility).

- **Greenhouse Gas Reporting Program (GHGRP):** The GHGRP was also developed under CEPA to require operators of facilities that meet specified criteria to report greenhouse gas emissions based on their global warming potential. Reports are due annually; in 2015 the landfill reported to the GHGRP.

**Provincial:** Ministry of Environment Online Portal

- The Saskatchewan Ministry of Environment has established an online service that includes a web portal. The portal makes it easier to provide information to the province in a digital format, and allows clients to apply on-line for permits, approvals, and track the progress of their applications. The account is mainly used for discharge and discovery reporting, environmental report submissions, and freedom of information requests to the Ministry.

**Service Status:** These reporting obligations are not expected to change in the near future.

**3.4 Landfill Soil Acceptance**

The landfill accepts soil materials categorized as “clean fill” for use as daily and intermediate waste cover. Covering waste layers with soil is part of standard waste management operations and is a regulated activity under the Ministry of Environment.

Under the regulations and for operational efficiency and safety, the clean fill used for waste cover must meet a standard soil quality. Clean fill cannot contain any foreign debris (such as, but not limited to, wood, stumps, branches, concrete, asphalt, metal, plastics, ceramics and masonry materials, rocks greater than 2 inches in diameter, and refuse), and must have chemical concentrations of regulated substances below applicable provincial criteria.

In order to maintain this quality standard for soil that is delivered to the landfill, Environmental Protection staff review and approve commercial soil delivery applications as requested by landfill staff, and provide training as needed.

Service Provided	Metric	2014	2015
Landfill Soil Acceptance	Number of applications	50	26



*Saskatoon landfill operations.*

**Service Status:** Demand for this service varies with the number of construction projects taking place during the year, and with the availability of alternative disposal options. In 2015, there were fewer applications for commercial soil delivery. In addition, landfill staff had received training and were able to process some applications without support from Environmental Protection staff.

### **3.5 Spill Response**

Environmental Protection has taken the lead role in coordinating City departments to develop levels of service for spill response that may impact sensitive environments and water bodies. The description of the Corporate Spill Response project, found later in this document, provides additional information on this initiative.

Environmental Protection staff provide advice and training to internal staff on reporting spills appropriately, assistance with the development of spill response procedures, and assistance with procurement of spill response equipment.

In addition, the Environmental Protection Officer is able to conduct site investigations and coordinate soil and water sampling when appropriate.



*Above: Example of a spill from a collections vehicle.*

*Left: Example of a spill kit.*

Service Provided	Metric	2014	2015
Spills	Number reported to Section	24	21

**Service Status:** A Task Force for Corporate Spill Response was formed at the end of 2014 to help coordinate response to spills that may impact sensitive environments and water bodies. The Task Force determined that the appropriate first contact for the public was either Saskatoon Fire (via 911) or Public Works Dispatch. As a result, the number of calls reported to the E&CI Division decreased in 2015, and is expected to continue to decrease in future.

### 3.6 Sanitary Sewer Use

Section staff oversee processes related to the existing sanitary sewer use bylaw including billing for the Industrial Monitoring Program, review, approval and monitoring of Special Discharge Permits, review and approval of Discharge Management Plans for mobile food trucks, and development of source control programs for the sanitary sewer.

Service Provided	Metric	2014	2015
Industrial Monitoring Program	Number of surcharges levied	10	10
Special Discharge Requests	Number of applications	7	7
Mobile Food Trucks	Number of applications	4	4

**Service Status:** These services are provided by Environmental Protection staff on a temporary basis until the new Sewer Use Bylaw and associated Source Control Programs, which are discussed later in this document, are operationalized within the Community Standards Division.

### 3.7 Environmental Record Searches

Environmental Protection staff conduct searches of City environmental and property records at the request of external consultants and land owners. Most search requests are made as part of an Environmental Site Assessment process that involves making three (3) separate requests to the City. There is an opportunity to coordinate these requests and associated fees to improve service to customers that will be investigated in 2016.



*Historical site use at River Landing.*

Service Provided	Metric	2014	2015
Environmental Records Searches	Number of applications	24	37

**Service Status:** This service is currently provided free of charge to the public and to civic staff. In future, the opportunity to coordinate the public portion of this service through other operating groups who perform similar searches in the corporation will be examined along with the potential to implement a fee.

### 3.8 Public Inquiries and Complaints

Private citizens and businesses make inquiries and complaints to the City about environmental protection matters that Section staff respond to.

Service Provided	Metric	2014	2015
Public Inquiries (general environmental)	Number of inquiries (telephone, webmail, e-mail)	74	36

**Service Status:** Public inquiries about environmental protection matters are used to identify gaps in existing corporate environmental protection activities. Support services, projects, and programs are then developed to help increase corporate capacity for environmental protection and to close the gap. The number of public inquiries is therefore expected to decrease over time. For example, the number of inquiries decreased significantly from 2014 to 2015 as operations capacity developed elsewhere, via education and training, and the provision of advisory services, to handle these types of inquiries.



*Improper storm sewer use.*

## 4 Civic Programs and Projects

Protection of the soil, water, and air quality within our watershed is key to the health of our environment and the quality of life of our citizens. Environmental Protection projects and programs that were under development in 2015 are shown in the table below.

Water	Soil	Air
Corrosion Control Program: Lead Service Lines	Soil Handling Strategy	Air Quality Management
Sewer Use Bylaw		
Source Control Programs for the Sanitary Sewer		
Corporate Spill Response		
Stormwater Management Plan		
Watershed Protection		

### Watershed

A watershed is an area of land that is linked by a common connection to one watercourse. All the storm runoff and snow melt in this area is carried or “shed” to this common watercourse. Water moving within the watershed is affected by everything it comes into contact with including soil, vegetation, wildlife, and people.

#### 4.1 Watershed Protection

**Goal:** To engage in environmental protection on a watershed scale.

The South Saskatchewan River connects us to our up and downstream neighbours via our common concerns about the quantity and quality of water that is available to support and nourish our communities. The river is our source of drinking water as well as the recipient of our storm water and treated waste water.

Saskatoon participates in watershed protection initiatives through membership in a non-profit organization called the South Saskatchewan River Watershed Stewards Inc. (SSRWSI). A City Councillor and the Manager of the Environmental Protection Section sit on the Board of the SSRWSI.

In 2015, projects that were participated in via SSRWSI membership included:

- Promotion of watershed awareness and the Farm Stewardship Program through the Ministry of Agriculture's Growing Forward 2. The program provides cost-shared funding for agricultural producers who wish to enact best management practices for environmental protection and farm stewardship on their farms.
- Awareness and monitoring for aquatic and terrestrial invasive species.
- Source water protection planning for Pike Lake and Beardy's/Okemasis First Nation.
- Fish habitat monitoring.
- Youth education, including participation in the Caring for Our Watersheds program, which is led by Partners FOR the Saskatchewan River Basin (PFSRA). SSRWSI staff provide advice to students on their projects, and Board members participate as judges for the program.
- Participation in the development of a province-wide Master Naturalist program. This program is being led by the provincial Native Plant Society (NPS). SSRWSI provides program development advice and staff support in delivery of the training modules.

**Program Status:** Overall, the Stewards received over \$240,000 in 2015 project funding to support these initiatives, in addition to core funding from the province and membership fees. The City pays a \$20,000 annual fee for membership in the SSRWSI.



*The South Saskatchewan River Watershed.  
Map courtesy of the SSRWSI.*

## **Water**

Saskatoon is fortunate to be situated on the South Saskatchewan River. The river provides an abundant source of fresh water that originates in the Bow and Oldman rivers in Alberta. It flows through Lake Diefenbaker where the Gardiner Dam, one of the largest earth-filled dams in the world, regulates the river flow through Saskatoon. We benefit from a more consistent flow of water and an improved water quality, as nutrients and other suspended particles in the water can settle out.

Saskatoon is the largest city on the South Saskatchewan River, so how we use and treat water, as well as manage storm water and wetlands, will have an impact on our community health as well as that of our downstream neighbours.

### **4.2 Corrosion Control Program: Lead Service Lines**

**Goal:** To coordinate activities linked to lead service lines in Saskatoon.

Lead service lines are a public health risk because long-term exposure to lead in drinking water can impact human health, especially in young children, infants, and pregnant women.

The program was initiated in 2013 by bringing together all internal partners who worked with lead service lines in some capacity. Partners included: Saskatoon Water, Public Works, Construction & Design, Major Projects, Communications, and Environmental & Corporate Initiatives (E&CI).

#### **Key Outcomes:**

- Improvements and updates to the lead service line database (Major Projects).
- Implementation of an annual water quality monitoring program for lead service lines (Saskatoon Water).
- Level of service, with dedicated annual funding of \$1.5 million, developed for replacement of lead service lines (Major Projects, Construction & Design).
- Development of a Communication Plan and information materials for an annual mailing to residents with lead service lines (Saskatoon Water, E&CI).
- Transfer of customer service response from multiple points of contact to a single point of contact (Public Works).
- Development of a template for annual reporting of program activities to the Ministry of Environment (E&CI).

**Program Status:** Responsibility for program coordination and regulatory reporting has now been made a part of regular operations for Saskatoon Water as this has become a requirement within the Permit to Operate for the water treatment plant.

#### **4.3 Sewer Use Bylaw**

**Goal:** To update the existing 1971 sanitary sewer use bylaw and integrate this municipal bylaw with the national Waste Water Effluent Strategy.

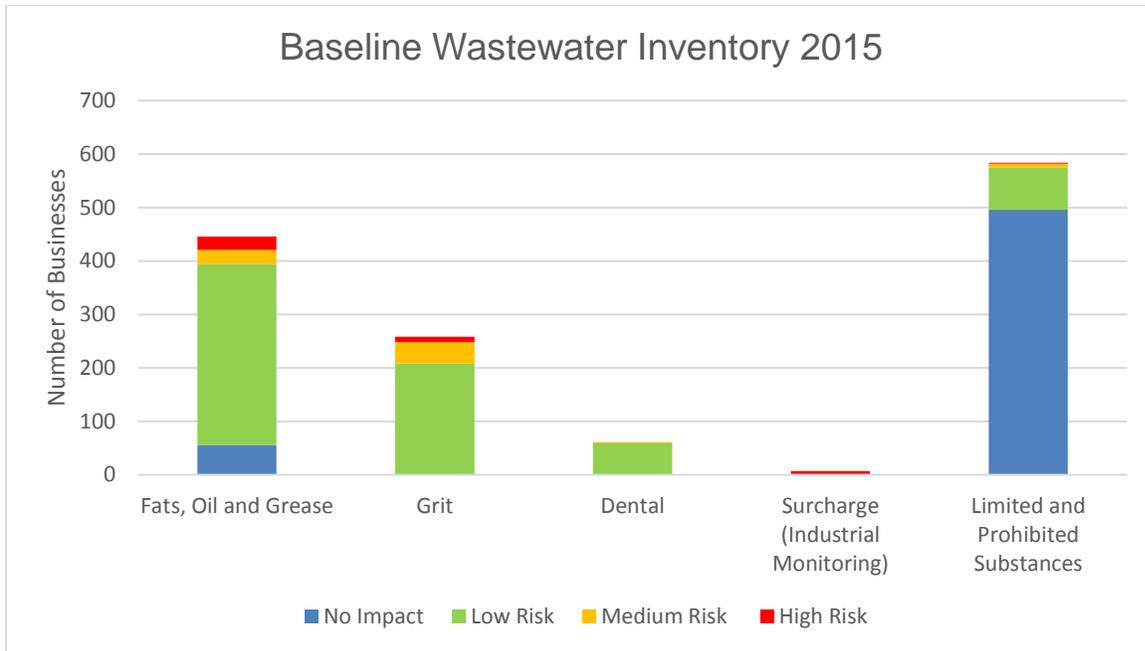
Communication was a key focus in 2015 for the Sewer Use Bylaw. Council had approved, in principle, the creation of a bylaw based on the principle of source control. Plans for amending the bylaw were put on hold to allow for greater communications and engagement with affected businesses on what this means. In addition, evaluation of the work on the bylaw to date revealed that there were changes that could be made to reduce potential impacts to businesses by taking a risk-management approach while still maintaining strong environmental protection outcomes.

**Project Status:** The risk-management approach to bylaw updates has been thoroughly communicated with internal work groups that will be impacted by the changes. In 2017, a report will go to City Council to explain the new direction for the bylaw and to request direction to proceed with updates.

#### **4.4 Source Control Programs for the Sanitary Sewer**

**Goal:** To develop a public education and compliance framework for implementation of a new sewer use bylaw.

**A baseline wastewater discharge inventory** was developed via site visits that were conducted throughout 2015. These site visits allowed the city to evaluate the actual risk related to the discharge by a variety of types of businesses. For each business, the level of risk was evaluated and the business was assigned to one or more of the source control programs for further follow up once the new bylaw comes into effect.



Nine (9) **source control programs** were identified; each program will focus on a particular class of substances, or a particular method of discharge, that presents a risk to the sanitary sewer system. Development of these programs continued throughout 2015 via consultations with operating groups that would be impacted by each program, development of an operations plan for implementation of the programs, and preparation of guidance documents for each program to support implementation of an updated Sewer Use Bylaw.

Program	Substance or Discharge Method of Concern
Limited and Prohibited Substances	All substances prohibited by the bylaw or allowed only in limited amounts.
Fats, Oils, and Grease	Cooking oils, salad dressings, etc. that solidify in pipes.
Grit	Sand, gravel, etc. that settles in pipes.
Dental Amalgam	Plaster, etc. that solidifies in pipes.
Surcharge	Treatable substances that are discharged in large volumes.
Trucked Liquid Waste	Wastewater that is delivered to the treatment system by trucks.
Mobile Food Trucks	Wastewater that is discharged by mobile food service businesses.
Septic Dumps	Wastewater that is discharged in unmonitored connections to the sanitary sewer system.

Program	Substance or Discharge Method of Concern
Special Discharges	Requests for temporary discharges to the sanitary sewer.

Civic services that will benefit from these programs include the sanitary sewer collection system, the wastewater treatment plant, and plumbing inspection services. The new risk-management approach that is embodied in these source control programs is anticipated to reduce annual operating costs by \$150,000 from previous estimates.

**Project Status:** Going forward, administration of the source control programs and enforcement of the new bylaw is intended to be brought under the new Community Standards Division. The baseline wastewater discharge inventory and guidance documents will be completed in 2016, and a communications plan will be initiated so that businesses can be informed of the coming changes well in advance of the effective date of the new bylaw.

### Soil

The health of our soil impacts the quality of the groundwater and surface water that we rely on as a drinking water source and affects the safety of the food that we grow. Citizens expect that they are protected from exposure to hazardous substances in soil as they live, play, and work. The decisions we make today about how we manage our soil can last for generations.

## 4.5 Soil Handling Strategy

**Goal:** To develop a corporate-wide strategy for dealing with contaminated soils that are discovered on City property during operational activities and construction projects.

Common contaminants that are encountered during civic construction projects include: hydrocarbons, dry-cleaning fluid, fly ash, and various organics. These contaminants can be linked to a variety of health impacts including respiratory illnesses and cancer.

Prior to the initiation of the Strategy, project managers and operations staff were individually responsible for compliance with environmental regulations related to contaminated soil management. As a result, implementation of appropriate risk management and safe handling measures was inconsistent and sometimes missing altogether.

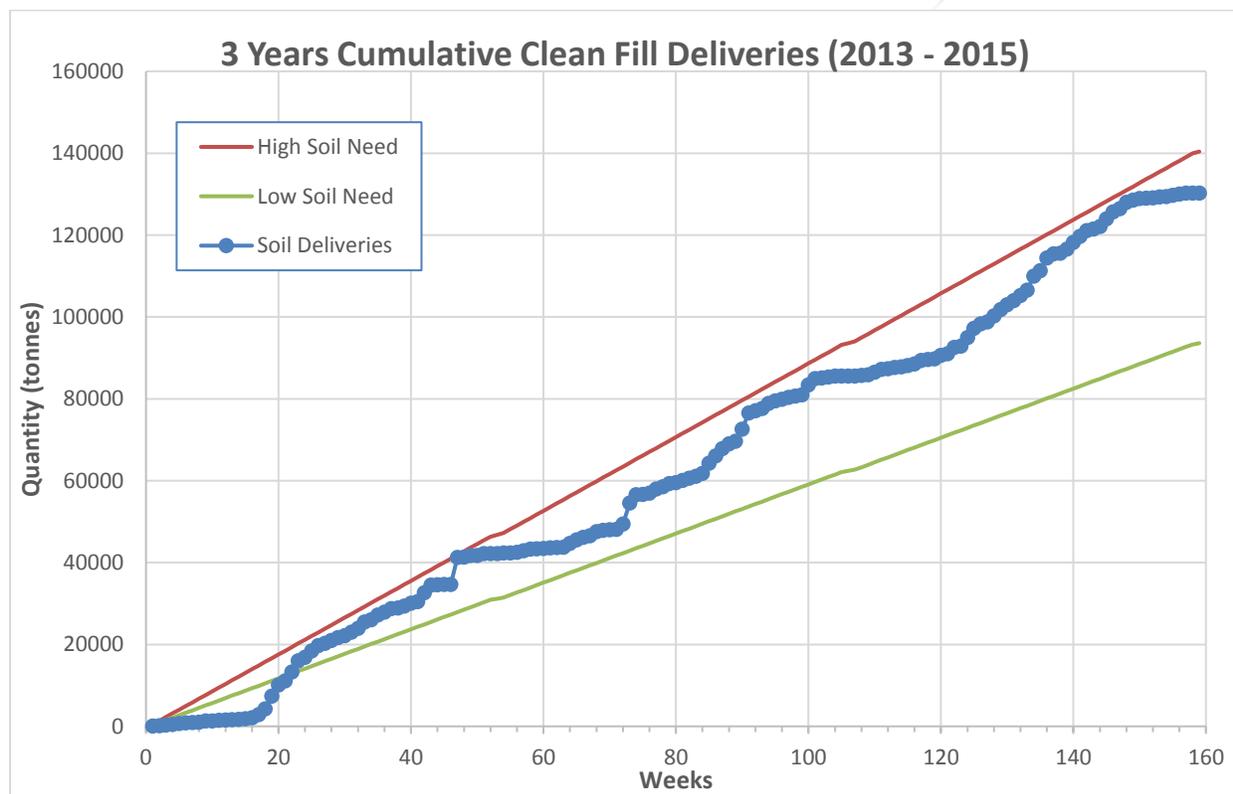
New provincial environmental legislation regarding contaminated soils came into effect on June 1, 2015. Regulators require a system for tracking and reporting impacted soil

discoveries, and promote risk management of impacted sites as well as beneficial soil reuse.

The Soil Handling Strategy has led to the development of tools to improve corporate-wide management practices for contaminated materials that is in compliance with the provincial Environmental Code.

### Key Outcomes for 2015:

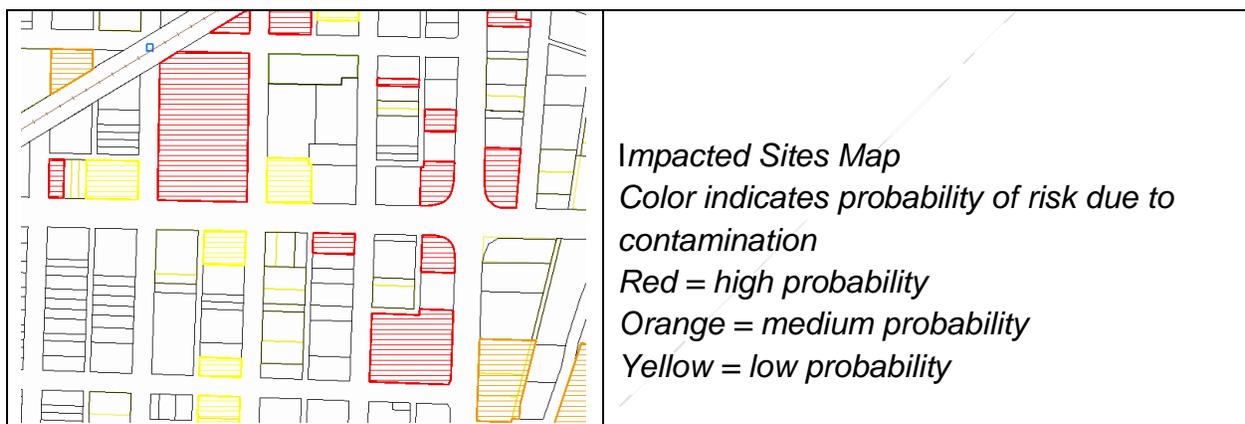
- Provision of free advisory services regarding risk management and regulatory compliance to all civic project managers and operations staff that encounter contaminated materials.
- Development of soil acceptance procedures for impacted soils that can be used as clean cover at the landfill.



Since 2010, more than **62,000 m<sup>3</sup>** (about 8,850 dump trucks) of impacted soil has been beneficially reused as clean fill at the landfill instead of being disposed of as waste. This has saved city projects approximately **\$7.3 million** in disposal costs.

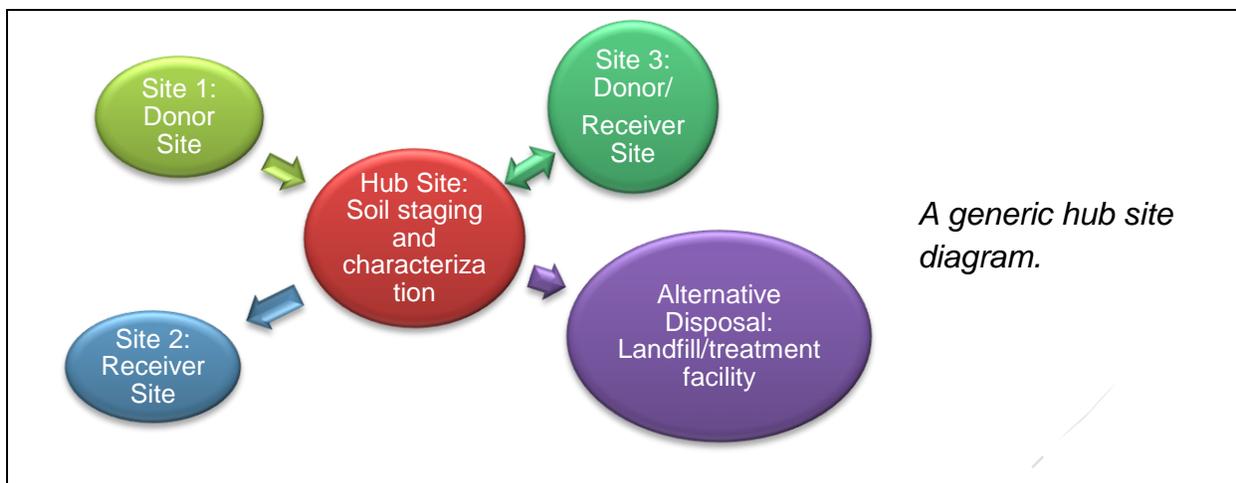
- Access to information and reporting tools on the Ministry of Environment's web portal made available through a civic account.

- Development of training sessions for civic project managers and operations staff about compliance with the new Environmental Code.
- Creation of safe handling procedures for workers handling contaminated soils.
- Pilot of a centralized communication centre for tracking clean and contaminated soils for civic projects.
- Draft of a generic Environmental Protection Plan that will streamline regulatory compliance and reduce costs for smaller projects that encounter contaminated soils.
- Development of a digital mapping tool in the City's Geographic Information System identifying the potential location of contaminated sites in Saskatoon, as well as the probable risks associated with each site.



There are over **450** potentially impacted sites in Saskatoon. In 2015, three projects managed risks related to **33,000 m<sup>3</sup>** (4,710 dump trucks) of impacted soil.

- Development of a hub site concept plan. A hub site is a temporary storage area for impacted soil or other materials until they can be properly characterized and a final reuse or disposal location can be determined.



*A generic hub site diagram.*

**Project Status:** Development of the soil handling strategy is now complete. It has been funded from capital, and the project will be closed. Ongoing support services and maintenance of the management tools developed under the strategy are not currently funded and therefore rely on cost recovery from operations and projects that use the tools and services. This may have a negative impact on both service utilization and environmental implications. Implementation of the strategy is also currently reliant on temporary staff resources.

#### 4.6 Corporate Spill Response

**Goal:** To develop a corporate wide approach to spills that may impact sensitive environments.

Under the *Discharge and Discovery Reporting Chapter* of the new *Environmental Code*, municipal employees are responsible, in the event of a spill, to ensure public safety and the protection of the environment.

The City already has robust response protocols for spills that are directly related to public safety; however there is less capacity to respond to spills that may have only environmental impacts. For example, spills can enter the river via storm water infrastructure. City operations do not currently have the equipment or training to respond to these spills and must focus on prevention measures and/or rely on third-party services.

Spill response is a service that is provided on demand by civic operations when a spill occurs on or is moving toward public property. The media profile of a spill, as well as the costs of containment and clean up, can be high. As such, it is beneficial for operating groups to cooperate in developing an integrated approach to spill response.

### Key Outcomes for 2015:

- Creation of spill response procedures and training for garbage collection fleet operations.
- Procurement of containment and clean-up equipment for landfill and public works (water and sewer) fleet vehicles.
- Development of draft staged Activation Scenarios that mesh with the civic Emergency Management Plan.
- Development of a draft communication plan with a focus on better training for customer service representatives regarding who to contact in the event of a spill report.
- Formation of a Joint Task Force to clearly define levels of service for spill response, to evaluate the costs of spill response at the corporate level, and to develop measures to facilitate operational responses.



*Spill of tar-like substance into the South Saskatchewan River.*

**Project Status:** Moving forward, the Environmental Protection section will lead the Task Force in examining the costs of service related to spills. This will include research into the practices of other municipalities, collection and analysis of data from Saskatoon Fire and Public Works on the costs associated with spill response, and investigation of how the polluter pays principle can be applied to cost recovery for spills in Saskatoon.

#### 4.7 Stormwater Management Plan

**Goal:** To integrate stormwater management and land use planning through a climate change adaptation lens.

Responsibility for stormwater systems has, historically, been scattered across multiple work groups and is chronically underfunded in municipalities across Canada. In Saskatoon, a Stormwater Utility was recently created to centralize management of this utility, and to collect fees to support maintenance and expansion of the system.

In the North American context, there has been a fundamental shift in the way that stormwater is regarded. In the past, runoff has been classified as waste, and the intent of a municipal stormwater system was to convey this waste as quickly as possible to a receiving body, such as our river. Today, stormwater is considered to be a resource, and large and medium-size Canadian municipalities are designing their cities to mimic pre-development rainwater absorption and runoff rates as closely as possible.

For the most part, modern stormwater management is being driven by a commitment to undertake climate change adaptation measures. Stormwater-related issues represent some of the biggest climate related risks that are under the jurisdiction of municipalities, and the need to address these issues adequately and cost-effectively has driven integration of land use planning with design and construction of both traditional grey infrastructure (pipes, catch basins, etc.) and newer green infrastructure (incorporating **natural elements**).

Saskatoon is currently in the process of developing a business plan for the stormwater utility. The Stormwater Management Plan project is intended to incorporate land use planning and utilization of environmental resources into the longer term management framework for the utility.

**Key Outcomes for 2015:**

- Continued implementation of a baseline sampling program for stormwater outfalls.
- Creation of tender documents for the purchase of a laboratory information management system (LIMS) to increase corporate capacity to store and analyze water quality data.
- Development of scope and deliverables for the project in partnership with Planning and Development and Stormwater Utility management.



*Stormwater outfall.*

**Project Status:** In 2016 the focus for this project will be to develop a project charter and engage stakeholders from across the corporation in the project. Research on practices in other provinces and municipalities will also be initiated.

## **Air**

Air quality is important to our health and environment. Poor air quality can lead to a range of health issues, from eye and nose irritation to severe respiratory problems, as well as environmental issues such as smog and acid rain. Saskatchewan has many favourable features for good air quality; low humidity, a smaller population and few geographical features that trap and accumulate pollutants. However there are many sources of air pollution including power generation, transportation, industry and chemical pesticide applications which make ongoing monitoring important.

### **4.8 Air Quality Management**

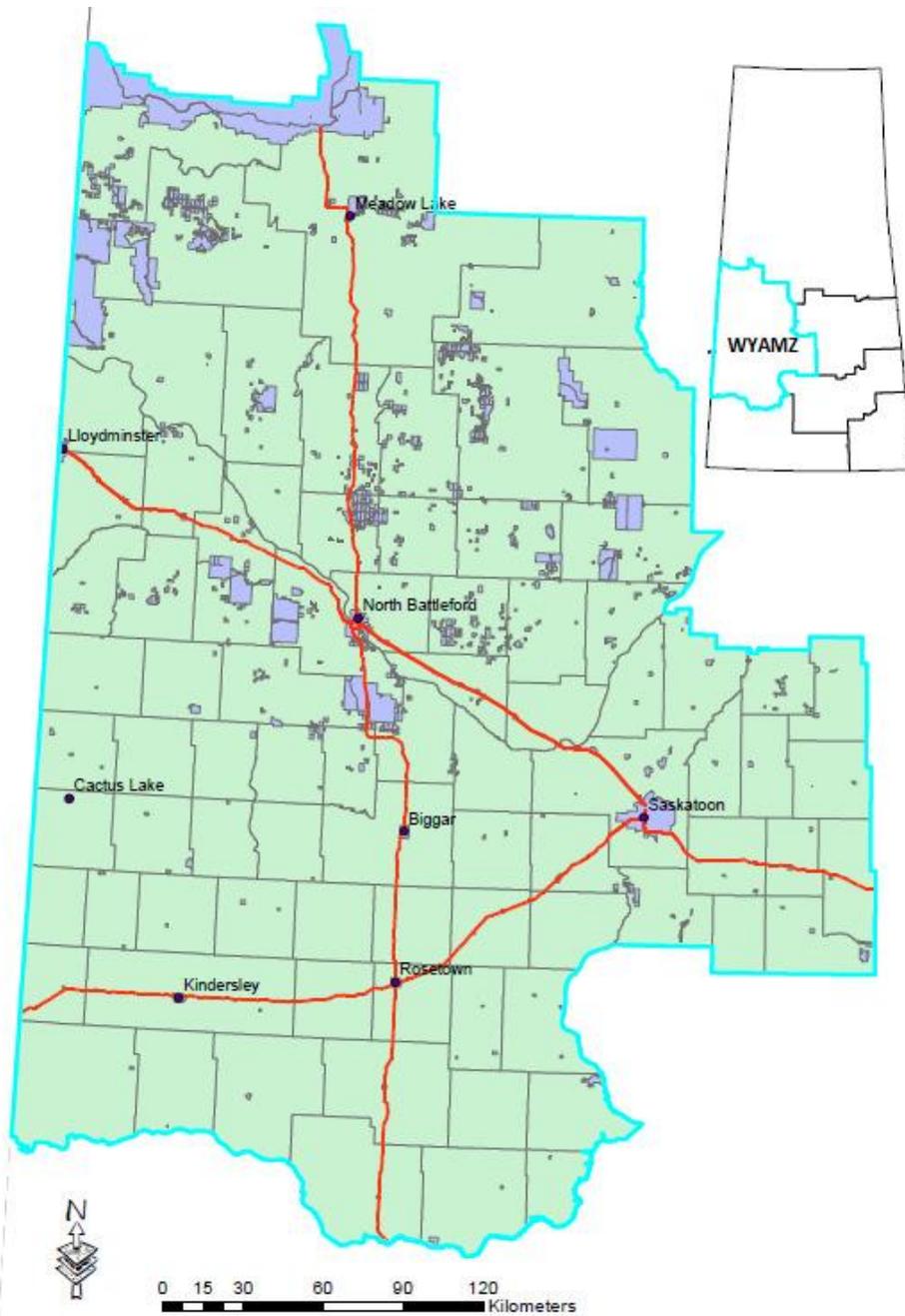
**Goal:** To engage in environmental protection at a regional scale (air zone).

Saskatoon belongs to the Western Yellowhead Air Management Zone (WYAMZ), a non-profit organization that represents public, industry, government, and non-government groups in the management of the air zone. Through WYAMZ, Saskatoon has a voice in the management of our air zone.

Monitoring stations are located in North Battleford, Meadow Lake, Unity, Kindersley, and Maidstone. Real-time and historic information is available for factors such as Nitric Oxide (NO), Nitrogen Dioxide (NO<sub>2</sub>), Oxides of Nitrogen (NO<sub>x</sub>), ground level ozone (O<sub>3</sub>), and fine particulate matter (PM<sub>2.5</sub>).

Saskatoon is required to track air pollutants emissions from several civic facilities, including the water treatment plant, the wastewater treatment plant, and the biosolids dewatering facility. These emissions are reported to Environment Canada's National Pollutant Release Inventory (NPRI).

**Project Status:** In 2015, the province of Saskatchewan carried out an urban air quality monitoring study in Saskatoon. Results of the study are anticipated in 2016 and will be communicated to the Saskatoon Environmental Advisory Committee when they become available.



*The Western Yellowhead Air Management Zone.  
Map courtesy of WYAMZ, 2013 Annual Report.*

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## Ecological Footprint Report 2014

### Recommendation

That the report of the General Manager, Corporate Performance Department, dated December 6, 2016, be received as information.

### Topic and Purpose

The purpose of this report is to provide the results of the City of Saskatoon Ecological Footprint Report 2014.

### Report Highlights

1. The 2014 Ecological Footprint for Saskatoon was 7.38 global hectares per person (or 1.88 million global hectares of land), which was an increase from 7.28 global hectares per person in 2010 and 6.90 global hectares per person in 2003.
2. The Saskatoon's 2014 Ecological Footprint was 78 times larger than the geographic area of the city, indicating our consumption demands far exceeded the community's ability or capacity to produce the materials we used and to absorb the waste we generated.
3. The city's per capita Ecological Footprint grew 1.4% between 2010 and 2014. The areas with increased footprints were Transportation, Goods and Services, and Government Services, while the footprints of the Food and Shelter areas decreased.
4. While the Ecological Footprint grew since 2010, the increase is substantially less than the growth observed in the city's population and economy over the same period.
5. A number of civic plans are expected to help reduce Saskatoon's Ecological Footprint in the future.

### Strategic Goal

The 2014 report addresses the Strategic Goal of Environmental Leadership – Saskatoon Grows in Harmony with Nature. The percentage change in the Ecological Footprint of Saskatoon is a success indicator in the Strategic Plan and provides the aggregate impact of the community in the areas of energy, waste and land use.

### Background

There have been two previous ecological footprint analyses completed for Saskatoon. An analysis based on 2003 data was completed as part of a Canada-wide study prepared by the Federation of Canadian Municipalities. The second ecological footprint analysis was based on 2010 data and was completed by the Planning and Development Division.

### Report

The ecological footprint (EF) is a tool that measures the environmental impact of human consumption. The findings are expressed in terms of the land area needed to support

the consumption behaviours of the population. The methodology for preparing the ecological footprint analysis has remained consistent for all three Saskatoon reports. The report can be found as Attachment 1.

Saskatoon 2014 Ecological Footprint

The overall ecological footprint and ecological footprint per capita have both increased for Saskatoon between 2003 and 2014. Saskatoon’s overall EF in 2014 was 1.88 million global hectares of land; this is 78 times larger than the geographical area of the city and 33% larger than the overall EF measured in 2003. A map to visualize the ecological footprint is included in Attachment 1.

Saskatoon 2014 per Capita Ecological Footprint

The per capita EF in 2014 was 7.38 global hectares per person, comparable to other ‘cold climate’ cities in developed nations, which was an increase of 1% since 2010 and 7% since 2003. Saskatoon’s EF per person is 5.3% higher than the Canadian average EF of 7.01 global hectares per person. This value is substantially larger than the global average EF of 2.7 global hectares per person and significantly greater than the global available biocapacity (the capacity of an ecosystem to produce biological materials used by people and to absorb waste materials generated by people, under current management schemes and extraction technologies) of 1.8 global hectares per person.

Modest Increases

It may also be noted that while the city’s EF grew since 2010 (+1.4%), the increase is modest when compared to growth observed in the City’s population (+9.7%) and economic indicators such as gross domestic product (+11.6%) and employment (+20%).

The following is a summary of the per capita results showing increases in resource intensity for all categories except Food and Shelter.

Ecological Footprint (Global Hectares per Person)	Goods and Services (entertainment, recreation, charitable giving, etc.)	Food (includes impacts from production through consumption)	Shelter (household energy consumption)	Transportation (private vehicle use, public transit, air and rail travel)	Government Services (roads, snow removal, schools, health care, waste collection, etc.)	Total
Saskatoon (2014)	1.95	1.35	1.49	0.91	1.68	7.38
Saskatoon (2010)	1.87	1.39	1.67	0.80	1.54	7.28
Saskatoon (2003)	1.51	1.35	2.01	0.65	1.38	6.90

It is relevant to note that per household energy consumption decreased by 9.1% (electricity) and 15.5% (natural gas), relative to 2010, suggesting increasing energy conservation/efficiency at the community level.

### Saskatoon's Growth

The EF is a consumption analysis. Consumption in an urban context has two forms: (1) direct consumption by households; and (2) consumption by governments and other service providers to provide for that consumption. Residents and businesses necessarily consume goods and services and a growing population necessarily puts pressure on increasing consumption. Therefore, the EF is achieved through increasing efficiency of consumption and or actual reduction in consumption.

The EF's calculated for Saskatoon for 2010 and 2014 occurred during a period of significant growth. The 2010 – 2014 period in particular, has been characterized by rapid population growth and the infrastructure investment required to accommodate that growth. Table 1 in the City of Saskatoon Ecological Footprint 2014 report summarises key indicators of the population during the period. The following points provide further context for the growth that the City experienced during the period:

- 10,191 acres of land was annexed to the City of Saskatoon in 2010. This was about a 19% increase in the physical size of the city's jurisdiction.
- 15,639 dwelling units were built in the period, about an 11% increase in the housing stock.
- 2 neighbourhoods substantively built out, three new neighbourhoods were started and concept plans for two more were approved.
- Almost 20,000 (11.7%) more people (CMA) were employed.

Saskatoon grew rapidly over the period between the 2010 and 2014 Ecological Footprint measurements. The measures of the population, economy, and physical size of the city grew by 10% or more during the period while the per capita ecological footprint grew by 1.4%.

### Plans for Reducing the Ecological Footprint

To increase the efficiency of consumption and to provide citizens with choice in terms of the amount each must necessarily consume, the City is working on the development and implementation of a number of important initiatives:

- Growth Plan to Half a Million outlines strategies to increase opportunities for greater choice in terms of housing form and location, transportation options, and mix of land uses that make it possible to live, work, play and shop all within closer proximity.
- Waste Diversion Plan will outline strategies for increasing the amount of waste that is reused or recycled for other valuable purposes to 70% and potentially leading to a zero-waste culture thus creating increased local economic opportunity.
- Community Energy Plan will outline strategies for reducing community and corporate greenhouse gas emissions through greater efficiency and the generation of energy from renewable resources.
- Green Infrastructure Strategy will identify strategies for utilizing the ecosystem services of nature and reducing the need to replicate these services through resource-intensive built infrastructure.

These plans form the basis for a comprehensive sustainable community plan that can be expected to reduce Saskatoon's EF.

### **Communication Plan**

The results of Saskatoon's 2014 Ecological Footprint will be communicated through the Performance Dashboard section of the City's website and through annual updates to *Our Environment: The City of Saskatoon's Environmental Leadership Report*. Additional communications to support Our Environment may include the news media, social media, and the City's website.

### **Other Considerations/Implications**

As an information report there are no policy, financial, environmental, privacy, or CPTED implications or considerations.

### **Due Date for Follow-up and/or Project Completion**

The Administration intends to update Saskatoon's ecological footprint at five-year intervals and communicate results within updates to *Our Environment*. In early 2017, the data from this report will be included in a higher level document representing the four pillars of an Environmental Sustainability Plan. The data and related analysis will provide the context for discussions on issues and options facing our community and will be submitted to the Standing Policy Committee on Environment, Utilities and Corporate Services.

### **Public Notice**

Public Notice pursuant to Section 3 of Policy No. C01-021, Public Notice Policy, is not required.

### **Attachment**

1. City of Saskatoon Ecological Footprint Report

### **Report Approval**

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Ecological Footprint Report 2014.docx



# City of Saskatoon Ecological Footprint Report 2014

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A report prepared for The City of Saskatoon

Community Services Department, Planning and Development  
Division

Corporate Performance Department, Environmental and  
Corporate Initiatives Division

Prepared by Anielski Management Inc.  
(Jeff Wilson and Mark Anielski)

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# City of Saskatoon Ecological Footprint Report 2014

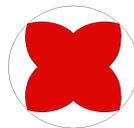
## A report on the ecological footprint and other select household consumption indicators

Prepared for

City of Saskatoon

Community Services Department: Planning and Development Division  
Corporate Performance Department: Environmental and Corporate Initiatives Division

by Jeff Wilson and Mark Anielski of



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## Executive Summary

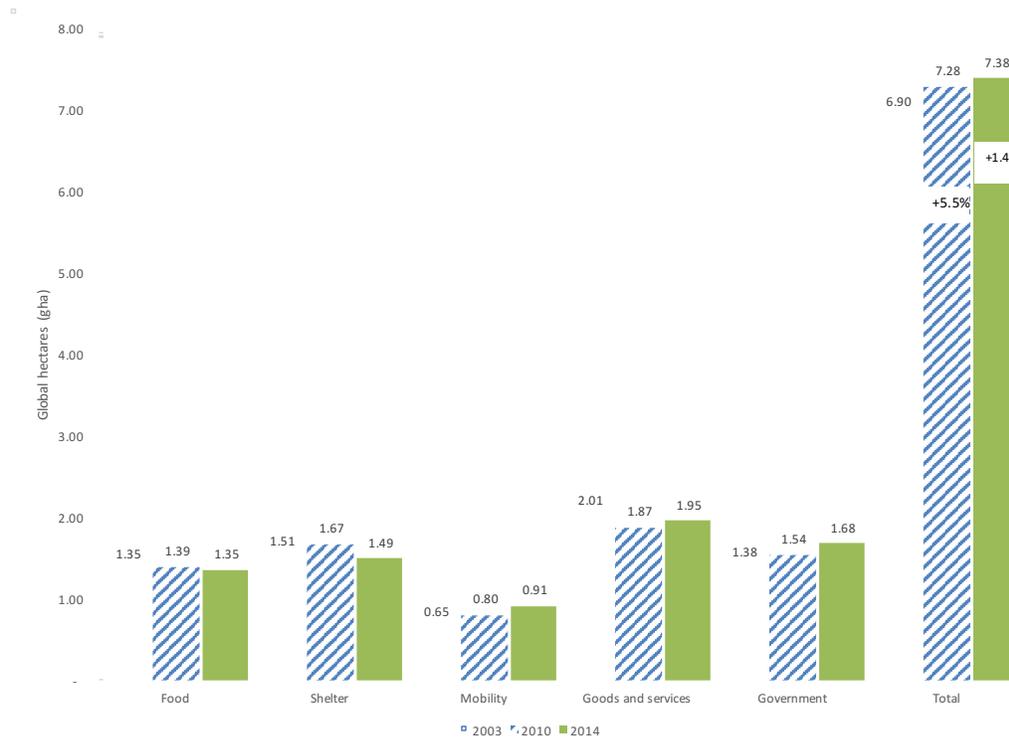
The City of Saskatoon has committed to reporting the ecological footprint as part of a larger indicator framework to track and measure progress towards sustainability and quality of life objectives. The ecological footprint is a sustainability accounting tool that measures the environmental impact of human consumption. Saskatoon's ecological footprint accounts for our population's consumption of food, transportation, housing, goods and services, and government services and expresses the findings in terms of the land area needed to support that level of consumption.

The ecological footprint inverts the traditional concept of 'carrying capacity' (the population a given region could support) and instead seeks to determine the total land area required, regardless of where that land is located, to sustain a given population. The ecological footprint is unique in that it accounts for the environmental impacts of consumption regardless of where the burden of that consumption falls in terms of production costs and pollution (Rees and Wackernagel, 1996). ***The Saskatoon ecological footprint, therefore, is the sum environmental impact of all Saskatoon residents' consumption no matter where in the world the environmental impact occurs.*** The ecological footprint expresses results in global hectares. A global hectare is a standardized hectare to account for the fact that different land types and different land categories have different productivity or biocapacity potentials.

In 2014, the average per capita Saskatoon ecological footprint was 7.38 global hectares per person or a total area of 1.88 million global hectares of land. The ecological footprint total area for Saskatoon is 78 times larger than the geographic area of the City. Saskatoon's ecological footprint per person grew by 1.4% between 2010 and 2014 (Figure 1).

Three footprint components contributed to the overall increase: goods and services (+3.8%), government services (+8.8%) and transportation (+13.9%). Increases in these components were offset by a 10.9% decrease in the shelter component. The rise in the goods and services component and government services component reflect higher levels of household and government spending per person (in constant dollars). The rise in the transportation component reflects an increase in air travel and an increase in fuel consumption.

Figure 1: Saskatoon ecological footprint 2003, 2010, 2014 (summary)



The rise in ecological footprint between 2010 and 2014 coincided with a period of rapid economic development in Saskatoon as reflected in key socio-economic indicators. Gross domestic product (GDP) per person, household income, and household spending for example all increased by over 10% (Table 1).

Table 1: Key socio-economic indicators

	% change 2010 to 2014
GDP per person (Saskatoon CMA)	+ 11.6%
Employment (Saskatoon CMA)	+20.0%
Household median income	+ 12.7%
Household spending	+ 10.6%
Average home price	+17.7%
Population	+ 9.7%
Ecological Footprint per person	+1.4%

In comparison, the increase in the ecological footprint per person was considerably less than changes in other key socio-economic indicators. In addition to these indicators, two key ecological footprint components decreased, the shelter footprint (-11%) and the food footprint (- 3%).

The good news was reflected in other indicators of environmental performance as well (Table 2). For example, household electricity use, natural gas use, household waste going to landfill and greenhouse gas emissions (GHG) associated with public transit all decreased while public transit ridership increased.

**Table 2: Environmental performance indicators (change 2010-2014)**

	<b>% change 2010 to 2014</b>
Electricity use per household	- 9.1%
Natural gas use per household	-15.5%
Household waste to landfills	- 13.4%
Public transit GHG emissions	-6.7%
Public transit ridership	+ 0.2%

Overall, environmental performance by Saskatoon households in 2014 is summarized as follows:

**Table 3: Household environmental performance indicators (summary)**

<b>Average Saskatoon Environmental Performance</b>	
Ecological footprint per household	17.5 gha
Direct GHG emissions	17.3 tonnes of CO <sub>2</sub> e
Shelter emissions	9.4 tonnes of CO <sub>2</sub> e
Transportation emissions	9.4 tonnes of CO <sub>2</sub> e
Water use	560 liters
Waste to landfills	771 kg
Waste diverted from landfills	338 kg

## Introduction

The City of Saskatoon has committed to reporting the ecological footprint as part of a larger indicator framework to track and measure progress towards sustainability and quality of life objectives. Saskatoon's ecological footprint accounts for our population's consumption of food, transportation, housing, goods and services, and government services. The findings are converted to the total land area (global hectares) needed to support our population's consumption demands to make it easier to compare the impacts of different types of consumption.

This report updates Saskatoon's ecological footprint for the year 2014; the previous ecological footprint was calculated in year 2010. In addition to reporting an ecological footprint, the 2014 update reports a series of household consumption indicators. Expanding the suite of indicators offers a more complete understanding of household environmental impact and complements the ecological footprint as a broad measure of household sustainability. Further, it offers a more robust framework to track progress of sustainability efforts targeting households over time.

Household consumption indicators reported in 2014 update include:

- Ecological footprint
- Ecological footprint by consumption category (food, shelter, goods and services, transportation, government services)
- Direct greenhouse gas emissions – shelter (electricity and natural gas)
- Direct greenhouse gas emissions – transportation (personal transportation, transit)
- Residential waste (landfill, recycling, compost)
- Residential water use

The selected suite of indicators offers community leaders, policy makers and city planners useful information to help develop sustainability strategies targeting the household sector. Further, the findings can be used to raise awareness and educate citizens about the sustainability impacts of lifestyle choices and inspire and promote dialogue to encourage household behaviour change.

While the focus of the report is to update the 2010 ecological footprint, time series data points are presented for the additional indicators as well.

Household consumption indicators are discussed in terms of broader progress toward reducing household environmental impacts.

### **The Average Saskatoon Household Environmental Performance**

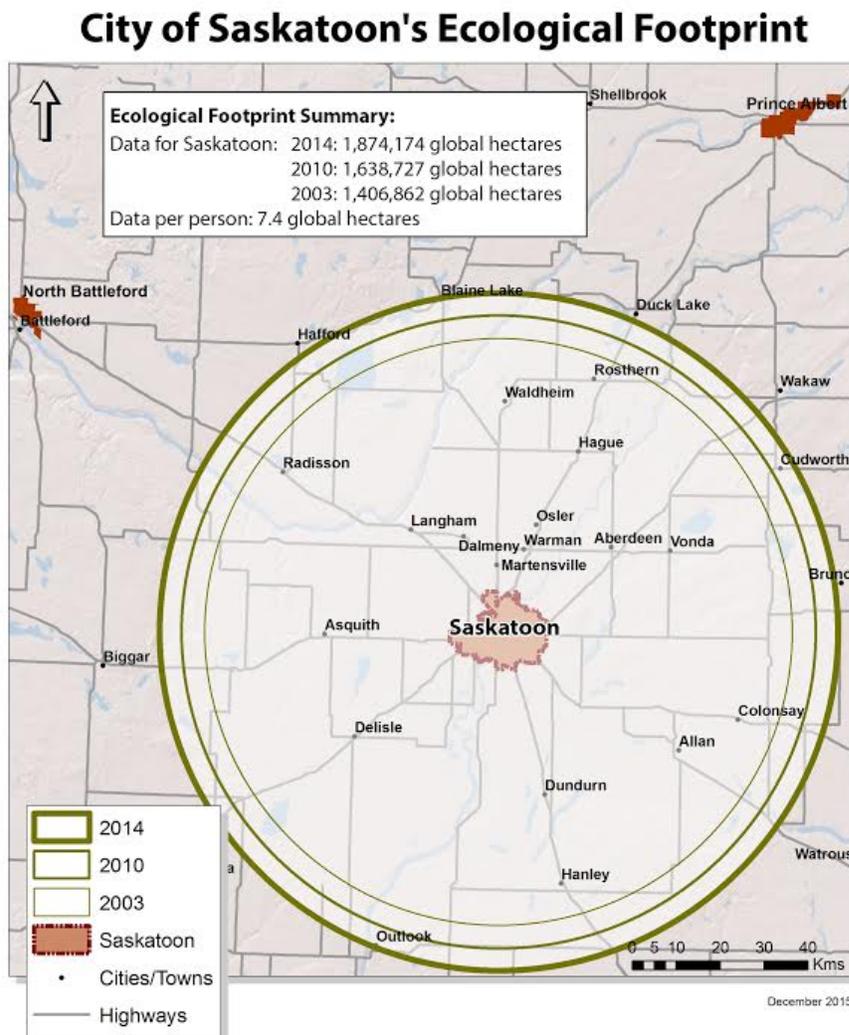
- Ecological footprint: 17.5 gha
- Direct GHG: 17.3 tonnes of CO<sub>2</sub>e
  - Shelter - 9.4 tonnes of CO<sub>2</sub>e
  - Transportation - 7.9 tonnes of CO<sub>2</sub>e
- Water use: 560 liters
- Waste to landfills: 771 kg
- Waste diverted from landfills: 338 kg

## Saskatoon Ecological Footprint

- The average Saskatoon household used 17.5 global hectares (43.2 acres) of land in 2014 which is the equivalent of 27% of a quarter section of farm land.

The average ecological footprint of a Saskatoon resident in 2014 was 7.4 global hectares per person (gha/person) or 17.5 gha per household. In terms of total area, the city's ecological footprint of Saskatoon's 107,424 households far exceeds its geographic area. Saskatoon's total ecological footprint occupied almost 1.9 million global hectares. This is more than 78 times larger than the city's total land area (23,637 hectares). Figure 2 depicts how Saskatoon's ecological footprint has grown between 2003 and 2014 in relation to City boundaries.

Figure 2: Saskatoon's ecological footprint



The Saskatoon ecological footprint is able to exceed the political boundaries of the city as it is a measure of total household consumption of Saskatoon residents. The indicator accounts for the consumption of materials and energy of a given population regardless of where the extraction, production, and manufacturing occur. In fact, the majority of Saskatoon’s ecological footprint falls outside its borders. Because of trade the impacts associated with resource extraction, food production, manufacturing and distribution, for example, do not necessarily occur within Saskatoon, Saskatchewan or Canada for that matter. As an indicator, the ecological footprint accounts for the impacts of consumption regardless of where in the world they take place.

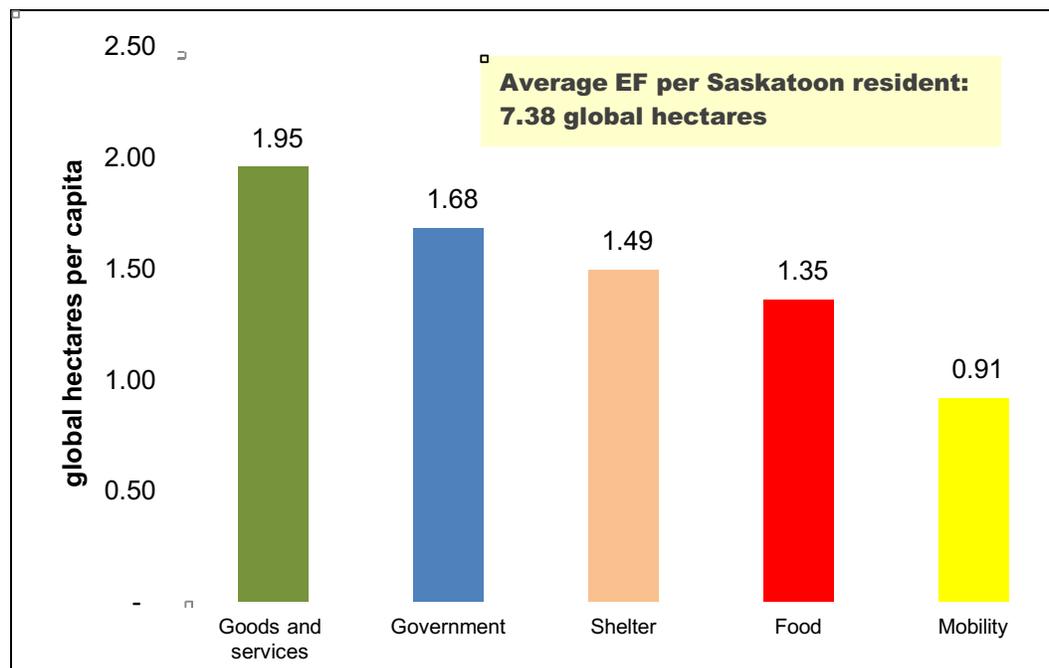
**Global Sustainability Perspective**

Similar to other Canadian cities, Saskatoon’s ecological footprint remains substantially higher than the global sustainability threshold of 1.7 hectares per capita (Living Planet Report, 2014). The global sustainability threshold is determined by taking the total amount of bioproductive space in the world and dividing it by the total population. Assuming an equal distribution of bioproductive space among the global population, Saskatoon residents, on average, are using over four times more than their 1.7 hectare share of the global bioproductive space.

### Ecological footprint by consumption category

The Saskatoon ecological footprint can be broken down by consumption category (Figures 3, 4). Consumption categories include food, shelter, personal transportation, goods and services, and government.

Figure 3: Saskatoon ecological footprint by consumption category



The consumption of goods and services makes up 26% of the total ecological footprint, the largest of the footprint categories (Figure 4). The goods and services component has contributed most to the increase in ecological footprint since the year 2003 (Table 4) increasing 29% between 2003 and 2014. Since 2010, the goods and services component has increased by 4%. The goods and services category accounts for all the stuff we buy and the services we use other than those directly related to food, housing and transportation. These include recreation expenditures, entertainment, computer equipment, education supplies, legal and financial services, gambling, tobacco and alcohol products, insurance, pension fund contributions and charitable giving. Expenditure data are from the Statistics Canada Survey of Household Spending. To compare results between years, expenditures are adjusted by the Consumer Price Index to ensure constant dollars. The increase in this component of the footprint correlates with the rise in household incomes and wealth in Saskatoon.

Government services makes up 23% of the total ecological footprint. Government services would include such things as roads, schools, health care, garbage collection, and snow removal. The government services component of the footprint is estimated based on government expenditures from City and Provincial accounts. To compare results between years, government expenditures are adjusted by the Consumer Price Index to ensure constant dollars. Similar to the goods and services component, the strong economy between 2003 and 2014 has contributed to the 21% rise in the government services component of the ecological footprint; the government services footprint increased by 9% between 2010 and 2014.

Shelter, which includes household energy consumption as well as the materials and energy used to maintain the shelter, makes up 20% of the total ecological footprint. The shelter footprint component has been steadily declining since 2003 falling by 26%. Between 2010 and 2014 the shelter footprint fell by 11%. The steady decline in the shelter footprint category has played a critical role in offsetting increases in the other footprint categories such as transportation and household goods and services. The energy component is calculated directly using electricity data and natural gas data provided by the City of Saskatoon from the utility companies. The non-energy component of the shelter footprint is based on household square footage data provided by the City of Saskatoon.

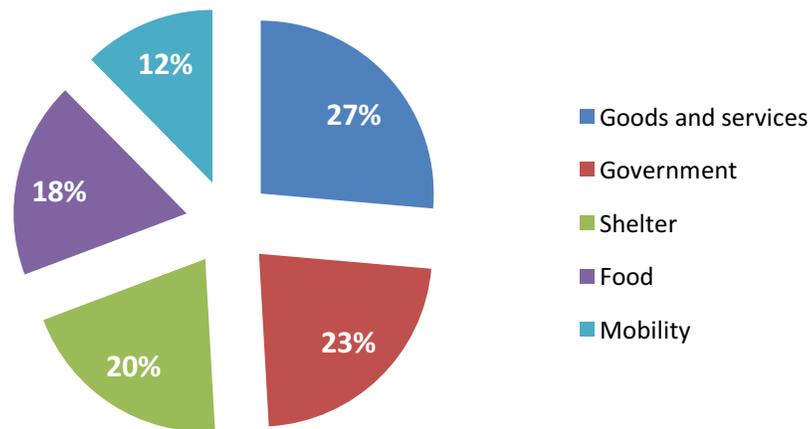
The food category makes up 18% of the ecological footprint and includes the impacts from the production phase through to consumption. The food footprint has been mostly unchanged since 2003. The food footprint is based on expenditures on food from the Survey of Household Spending. To compare results between years, food expenditures are adjusted by the Consumer Price Index to ensure constant dollars.

Personal transportation accounts for 12% of the ecological footprint. The transportation footprint has increased by 14% between 2010 and 2014. Since 2003 it has increased by 40%. The category accounts for private vehicle use, public transit, air travel and rail travel. Private vehicle use contributes most to the respective category (54%) followed by air travel (40%). The transportation footprint is estimated based on a combination of expenditure data from the Survey of Household Spending and fuel

consumption provided by the City of Saskatoon. For a description of consumption categories, ecological footprint calculation approach and source references, see Appendix A.

Figure 4: Saskatoon ecological footprint by component

□



## Historical Comparisons, 2003, 2010, 2014

Saskatoon's ecological footprint per person increased by 0.10 gha between 2010 and 2014 (Tables 4, 5 and Figure 5). Three categories increased: government services (0.14 gha/ person), transportation (0.11 gha/person), and goods and services (0.08 gha/person). The food component (0.04 gha/ person) and shelter components (0.18 gha/person) decreased. Since the initial Saskatoon ecological footprint estimate for 2003, Saskatoon's ecological footprint per person has increased by 7% (Wilson and Anielski, 2004).

Table 4: Saskatoon ecological footprint - 2003, 2010, 2014

EF (gha/person)	Goods and services	Food	Shelter	Transportation	Govt.	Total
<b>Saskatoon (2014)</b>	1.95	1.35	1.49	0.91	1.68	<b>7.38</b>
<b>Saskatoon (2010)</b>	1.87	1.39	1.67	0.80	1.54	<b>7.28</b>
<b>Saskatoon (2003)</b>	1.51	1.35	2.01	0.65	1.38	<b>6.90</b>

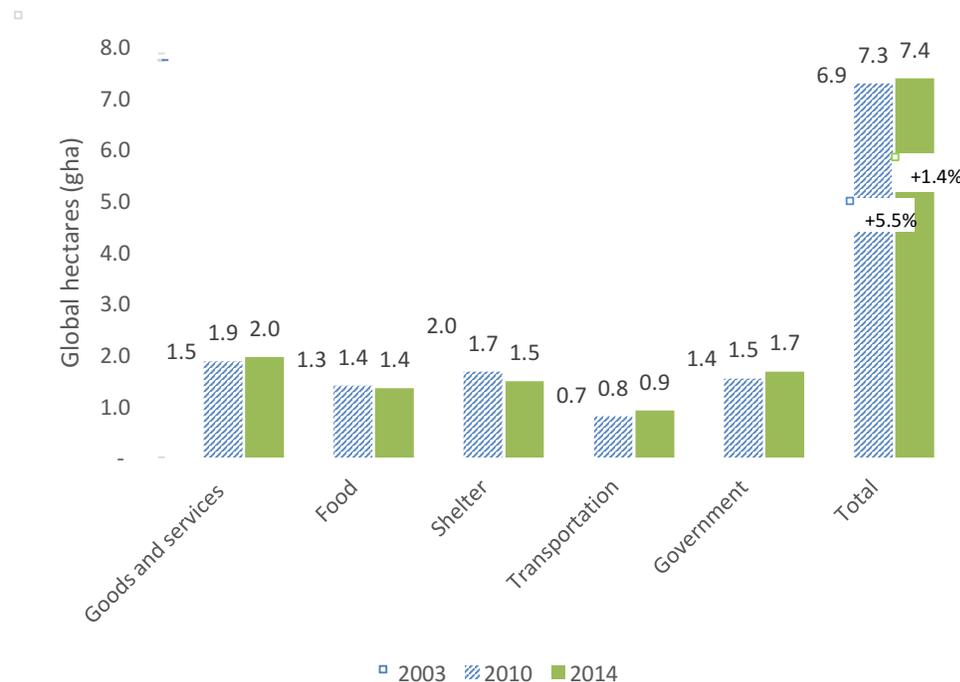
Table 5 shows the percentage changes in the ecological footprint components by consumption category between 2010 and 2014 and between 2003 and 2014. Since 2003, in percentage terms, the transportation category has increased the most (+40%). In terms of overall impact, however, the good and services category has risen the most (0.44 gha/person).

Table 5: Ecological footprint per capita – percentage change

	2010-2014	2003-2014
<b>Goods and services</b>	+ 4%	+ 29%
<b>Food</b>	- 3%	unchanged
<b>Shelter</b>	- 11%	- 26%
<b>Transportation</b>	+ 14%	+ 40%
<b>Government</b>	+ 9%	+ 21%
<b>Ecological footprint</b>	+ 1%	+ 7%

Between 2010 and 2014, the transportation (+14%), government services (+9%) and goods and services (+4%) components contributed to the rise in ecological footprint. A decrease in the shelter component by 11% helped offset the increases in terms of total ecological footprint. Similar to the 2010-2014 period, the rise in the transportation, goods and services and government services components largely explain the 7% increase in ecological footprint per person between 2003 and 2014. In terms of total contribution to the footprint, transportation represents 12% whereas the goods and services component represents 27%. The shelter component (which includes household energy use) has declined substantially (down 26%) while the food component has remained relatively unchanged since 2003. Figure 5 compares the Saskatoon ecological footprint by component for the years 2003, 2010 and 2014.

Figure 5: Saskatoon ecological footprint 2003, 2010, 2014



## Ecological footprint comparisons – total footprint

In terms of total land area, Saskatoon's ecological footprint has increased by 34% since 2003, from 1,406,862 global hectares (3,474,948 acres) in 2003 to 1,878,174 global hectares (4,641,069 acres) in 2014 (Table 3). To put this growth into context, the net growth of 471,312 global hectares (1,164,637 acres) in total ecological footprint area since 2003 is the equivalent of 691 Saskatchewan farms (which average 1,688 acres per farm). Over the same period, Saskatoon's population grew by 24.9% from 203,893 in 2003 to 254,569 in 2014. The rise in Saskatoon's total ecological footprint reflects an increase in population size (+25%) and an increase in ecological footprint per person (+7%).

Table 6: Saskatoon, total ecological footprint area (2003, 2010, 2014)

EF (Global hectares)	Goods and services	Food	Shelter	Transportation	Govt.	Total
Saskatoon (2014)	495,456	344,866	378,799	232,440	426,613	1,878,174
Saskatoon (2010)	422,008	313,485	375,979	180,410	346,844	1,638,727
Saskatoon (2003)	307,408	274,936	409,975	133,340	280,923	1,406,581

## Consumption in relation to biocapacity

Saskatoon's total ecological footprint area is 1.9 million hectares (4.6 million acres), the equivalent of 2,750 average sized farms in Saskatchewan (1,688 acres average farm size). The consumption demands of Saskatoon households alone dramatically exceed the available biocapacity in the region. Populations are able to exceed local biocapacity by importing goods and services from other regions of the country and the world.<sup>1</sup> Taking a regional lens, however, offers a more relevant context given that cities by their very nature depend on resources from outside their borders. If we assume a regional context to be a 100 mile radius<sup>2</sup> around the city, the region has an available biocapacity of 8.8 million hectares or roughly 40 hectares per Saskatoon citizen (Table 7 and Figure 6 map showing biocapacity by land type). Given the large amount of cropland and relative small population (254,569 in 2014) of Saskatoon and surrounding area, the region, in theory, has sufficient biocapacity to support the population. With a total ecological footprint area of 1,878,174 hectares in 2014, Saskatoon's households would require 21% of a 100-mile radius of available biocapacity.

<sup>1</sup> In a global economy, the impact of consumption falls not just in your own backyard but all over the planet. The ecological footprint is a useful indicator because it aggregates the impact of consumption and attributes it to consumer.

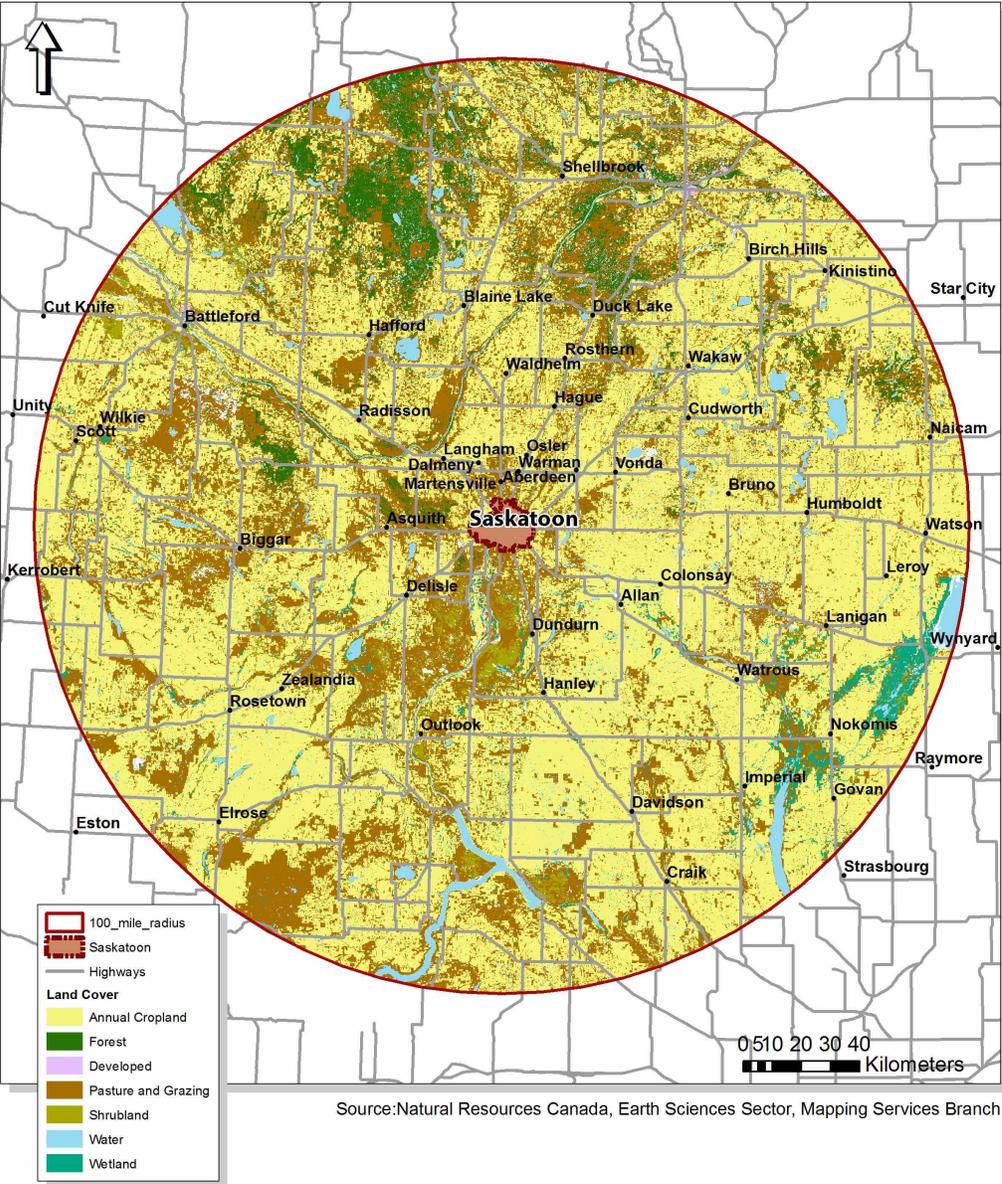
<sup>2</sup> A 100 mile radius was selected for illustration purposes and has no scientific basis.

Table 7: Available biocapacity within a 100 mile radius of Saskatoon

Land type	Biocapacity (hectares)
Cropland	5,628,411
Grazing land	2,391,659
Mixed wood	139,787
Forest	294,580
Water	216,832
Wetland	142,815
<b>Total</b>	<b>8,814,083</b>

Figure 6: Biocapacity within 100 miles of Saskatoon

# Land Use - 100 Mile Buffer



## Household Consumption Indicators

The ecological footprint is presented alongside a series of household consumption indicators in the context of understanding the broader environmental impacts of households. Indicators focus on three aspects of household consumption: direct greenhouse gas emissions, residential waste and water use.

### Direct greenhouse gas emissions

Our analysis focused exclusively on direct GHG emissions associated with the household sector (shelter and transportation). Direct GHG emissions refer to Scope 1 and Scope 2 emissions as defined by the World Resources Institute (WRI). Related to shelter, we report emissions for electricity consumption and natural gas consumption for home heating. We do not include other forms of home heating sources such as wood or oil. The focus is exclusively direct GHG emissions. We did not include indirect GHG emissions associated with energy production, distribution and trade, electricity and heating infrastructure, construction and maintenance, and operation of energy services. Our analysis also did not include the indirect emissions associated with physical shelter, such as construction, maintenance, and waste removal. For transportation, we report emissions for personal vehicle use and transit only. We did not include GHG emissions associated with air travel, rail or other forms of travel. We did not include the indirect emissions associated with transportation energy production, distribution and trade, emissions related to the manufacture, maintenance and disposal of private vehicles, as well as their transportation infrastructure, construction and maintenance, and operation of the transport business. Table 8 reports direct greenhouse gas emissions attributed to the average Saskatoon household.

**Table 8: Direct greenhouse gas emission – households (tonnes of CO<sub>2</sub>e/household)**

Shelter - electricity	Shelter - natural gas	Personal transportation – vehicle use	Personal transportation – transit	Direct GHG emissions
4.24	5.16	7.83	0.05	<b>17.28</b>

### Shelter

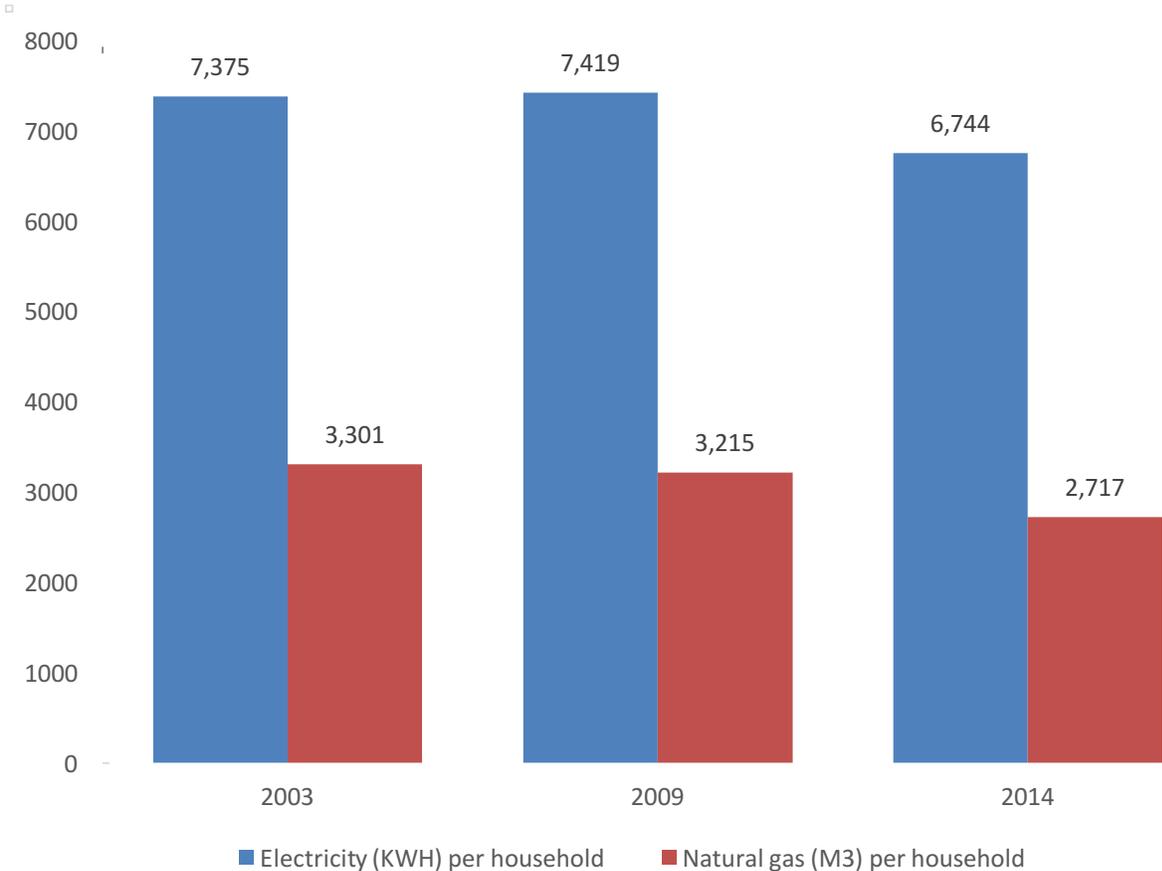
Electricity and natural gas consumption data were converted to GHG emissions using the conversion factors provided by the City of Saskatoon (2015a). In 2014, emissions attributed to household electricity use and home heating (natural gas only) totaled 9.4 tonnes of CO<sub>2</sub>e per household. Energy consumption affiliated with Saskatoon homes (0.97 gha/person) in 2014 accounted for 13.2% of the total ecological footprint. Approximately 55% of that amount can be attributed to natural gas use for space heating and 45% for electricity use.

Table 9: Shelter energy use (gha/person) for electricity and natural gas, 2014

Electricity	Natural gas	Shelter - energy
0.44	0.53	0.97

Figure 6 shows that electricity use per household decreased from 7,375 kwh per customer in 2003 to 6,744 kwh per customer in 2014; an 8.5% decrease. The decrease between 2009 and 2014 was 9.1%. Natural gas use per customer decreased by 17.7% between 2003 and 2014 from 3,301 m<sup>3</sup> per household in 2003 to 2,717 m<sup>3</sup> per household in 2014. Between 2009 and 2014 natural gas use per household declined 15.5%. These household energy use decreases indicate that Saskatoon households have become more energy efficient reducing total energy consumption and thus their respective direct greenhouse gas emissions footprint.

Figure 7: Saskatoon energy use, 2003, 2009, 2014



## Personal transportation

In 2014, direct GHG emissions associated with personal transportation use (personal vehicle use and transit use) totaled 7.87 tonnes of CO<sub>2</sub>e per household (Table 8). Personal vehicle use (7.83 tonnes of CO<sub>2</sub>e) accounts for over 98% of GHG emissions associated with personal transportation, while transit use accounts for less than 2% (0.04).

### *Personal vehicle use*

Greenhouse gas emissions associated with personal vehicle use are based on liters of gasoline consumed per vehicle from the Canada Vehicle Use Study for Saskatoon (Transport Canada, 2015). The per vehicle value is multiplied by the number of registered vehicles to determine a total value for the city (City of Saskatoon, 2015b). Liters of gasoline are converted to GHG emissions using the conversion factors provided by the City of Saskatoon (2015a). As the Canada Vehicle Use Study estimated fuel use using on-board technology as opposed to a recall survey, historical comparisons are not possible. Fuel use data based on litres sold in Saskatoon is available (Kent Group Ltd., 2015). The totals, however, do not distinguish between commercial use and private use. Between 2010 and 2014, GHG emissions based on total litres of fuel sold in Saskatoon increased by 11%.

### *Transit use*

Greenhouse gas emissions associated with transit use are from the City of Saskatoon's Environmental Leadership Report (2014). Public transit ridership has increased by only 0.2% between 2009 and 2014. However, between 2009-2013 transit ridership increased 13.9% from 11,579,606 rides in 2009 to 13,188,586 in 2013 reaching 53.4 trips per capita in 2013.<sup>3</sup> Unfortunately, in 2014 ridership fell sharply by 12.1% to 11,596,982 or only 45.6 rides per capita. On a positive note, total GHG emissions associated with transit use<sup>4</sup> declined 6.7% between 2009 and 2014 reaching 10,881 tonnes of CO<sub>2</sub>e in 2014 or an average of 0.043 tonnes of CO<sub>2</sub>e per person.

## Household waste

Household waste refers to the direct waste generated by the residential sector. Household waste offers a proxy for household material consumption and throughput. Figure 8 shows trends in total residential/household waste produced, which includes waste to landfills and waste diverted from

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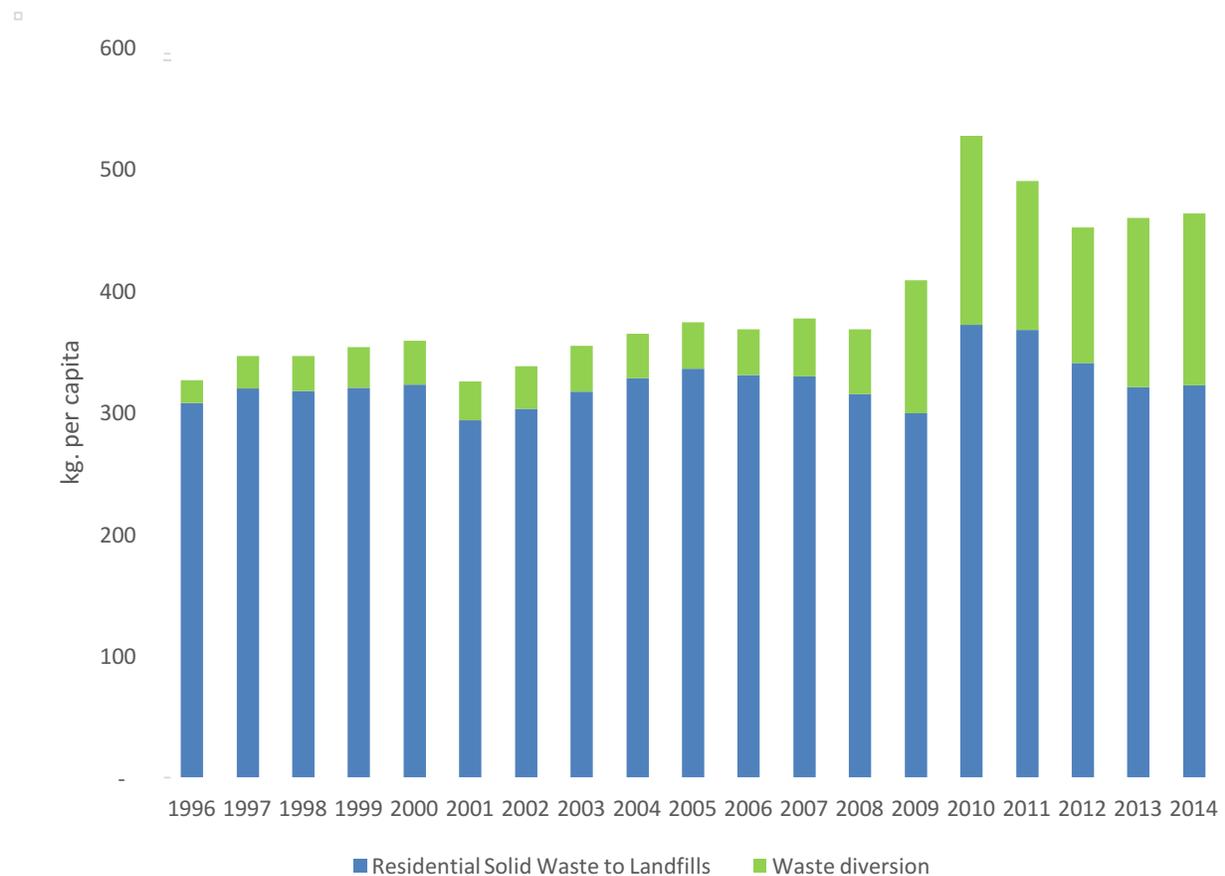
<sup>3</sup> City of Saskatoon, Transit. Figures reported from *Our Environment: The City of Saskatoon's 2014 Environmental Leadership Report*.

<sup>4</sup> Greenhouse gas emissions are estimated by the City of Saskatoon Transit using fuel data.

landfills through recycling between 1996-2014. The total residential waste per capita (including waste recycled) remained relatively steady from 1996 to 2008 then jumped in 2010 to a peak of 527 kg per person and since moderated at 463 kg per person in 2014. Between 2010-2014 household waste to landfills decreased by 13.4% while waste diverted from the landfill through recycling declined marginally by 9.0% from the peak waste diversion volumes achieved in 2010 (155 kg/ person).

In 2014, the total waste produced by households was 463 kg per person which included waste to landfills (322 kg/person) and waste diverted from landfill through recycling (141 kg/person). The good news is that residential waste to landfills grew by only 1.5% from 2003 to 2014, while the volume diverted from landfills grew by 278.4%. The bad news is that the total amount of waste produced (including recycled waste) by households remains higher than it was in the late 1990s in spite of recycling efforts.

Figure 8: Saskatoon residential waste and waste diversion, 1996-2014



## Residential water use

Households on average used 560 liters of water or an average of 234 liters of water per household member in the year 2014. Residential water use refers to direct water use only and does not include the indirect water use associated with food production, production of goods and services or any other upstream water use. It also does not include water consumed outside the home; for example, in the workplace, school or other commercial or institutional establishments.

## National and International Ecological Footprint Comparisons

From a global perspective, the 2014 Saskatoon ecological footprint of 7.4 gha per person remains substantially larger than the global average ecological footprint of 2.7 gha per person and greater than the global available biocapacity of 1.8 gha per person. Saskatoon's ecological footprint in 2014 is 5.3% larger than Canada's ecological footprint (last estimated in 2007) at 7.0 gha per person. Comparing the Saskatoon ecological footprint in 2014 with other benchmark countries (Table 10) shows that Saskatoon would rank 7th largest in the world, however, smaller than Edmonton's ecological footprint of 7.7 gha per person (2012 estimates). Saskatoon's ecological footprint is larger than Nordic countries like Sweden, Finland and Norway who have similar climates.

**Table 10: Countries with the largest ecological footprints (based on 2007 data other than Edmonton which is 2010 data)**

Largest ecological footprints by Nation	Ecological footprint per person	GDP per capita (PPP)	Ave. Annual Temperature °C
United Arab Emirates (#1)	10.7	\$66,300	26.8
Qatar (#2)	10.5	\$137,200	26.8
Denmark (#3)	8.3	\$44,600	7.5
Belgium (#4)	8.0	\$43,100	9.0
United States (#5)	8.0	\$54,400	11.6
Estonia (#6)	7.9	\$27,900	5.5
Edmonton (2012)	7.7	\$62,832	2.6
<b>Saskatoon (2014)</b>	<b>7.4</b>	<b>\$53,461</b>	<b>3.3</b>
<b>Canada (#7)</b>	<b>7.0</b>	<b>\$45,000</b>	<b>3.6</b>
Australia (#8)	6.8	\$46,600	17.3
Iceland (#9)	6.5	\$44,000	4.6
Kuwait (#10)	6.3	\$70,700	24.7
Finland (#13)	6.2	\$40,700	2.7
Sweden (#14)	5.9	\$46,200	4.7
Norway (#18)	5.6	\$67,200	4.3
<b>World</b>	<b>2.7</b>		

Sources:

1. Global Footprint Network, 2010, based on 2007 data  
[http://www.footprintnetwork.org/images/uploads/Ecological\\_Footprint\\_Atlas\\_2010.pdf](http://www.footprintnetwork.org/images/uploads/Ecological_Footprint_Atlas_2010.pdf).
2. Edmonton's Ecological Footprint 2014 (Anielski Management Inc. May 2014).
3. GDP per capita figures in PPP per capita are 2014 estimates from World Fact Book  
<https://www.cia.gov/library/publications/the-world-factbook/rankorder/2004rank.html>.
4. Average World Temperatures are from Weatherbase <http://www.weatherbase.com/weather/countryall.php3>.
5. Saskatoon GDP per capita (PPP) is estimated based on conversion of C\$65,915 per capita in 2014, converted to US dollars (\$59,681/capita) and then to PPP using a conversion ratio of 1.1163.
6. Edmonton GDP per capita (PPP) is from Brookings Institute, Global Metro Monitor.

It is sometimes argued that it is unrealistic for Canada or regions within Canada to attain a dramatically smaller footprint. The assumption is that Canadians would have to give up their high quality of life, security, or that geography and climate make it impossible for Canada to have a substantially lower footprint. There is evidence, however, to suggest that other countries are able to enjoy high quality of lives, experience happiness, and be financially well off on smaller ecological footprints. Similarly, there are countries with cold climates, resource based economies, and similar values that have ecological footprints much smaller than Saskatoon and Canada.

Canada's cold climate is often cited as a reason explaining our relatively large ecological footprint. Compared with Nordic benchmark countries, Saskatoon's ecological footprint is 33% greater than Norway, 25% larger than Sweden and 20% larger than Finland.

In terms of Western countries with the largest economies, if we compare the ecological footprints of the G8 nations (G7 + Russia), with the exception of the United States and Canada, the remaining countries have ecological footprints around a third less than the value of Saskatoon's ecological footprint.

## Conclusion

The City of Saskatoon's average ecological footprint per person increased by 1.4% between 2010 and 2014. The overall increase is consistent with a rise in household incomes, household spending and GDP growth. A rise in the goods and services, transportation, and government services components explain the higher ecological footprint. On a positive note, an 11% decrease in the shelter footprint offset the increases in the respective categories. The decline in a period of rapid economic development provides an example of where technology changes, rising household awareness and progressive policy decisions have made a positive impact. The good news was reflected in other indicators of household environmental performance as well. For example, household electricity use, natural gas use, household waste going to landfill and greenhouse gas emissions (GHG) associated with public transit all decreased.

Substantial reductions in Saskatoon's ecological footprint will take time and are a key component of a long-term sustainability vision. An important take away for community leaders, planners and policy makers is that large-scale footprint reductions require rethinking urban form, infrastructure, and

entrenched consumption and production patterns. While past decisions regarding major infrastructure and production systems lock a community into consumption patterns, current decisions can foster a lower impact future (Rees, 1999). Government policies, investments, and programs can support opportunities for households to lighten their ecological footprint and reduce household environmental impacts.

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## Appendix A – Methodological Background

### Background

The ecological footprint is an accounting tool that measures the environmental impact of human consumption. The tool accounts for a populations' consumption of food, transportation, housing, goods and services and expresses the findings in terms of the land area needed to support that populations' consumption demands. The ecological footprint inverts the traditional concept of 'carrying capacity' (the population a given region could support) and instead seeks to determine the total land area required, regardless of where that land is located, to sustain a given population. The ecological footprint is unique in that it accounts for the environmental impacts of consumption regardless of where the burden of that consumption falls in terms of production costs and pollution (Rees and Wackernagel, 1996).

***The Saskatoon ecological footprint, therefore, is the sum environmental impact of all Saskatoon residents' consumption no matter where in the world the environmental impact occurs.***

The ecological footprint tool makes it possible to estimate the area of land needed to support the consumption demands of Saskatoon residents. In more technical terms, the ecological footprint provides a snapshot in time and the trajectory over time of how much nature, expressed in a common unit of bioproductive space, is used exclusively for producing all the resources (food, energy, materials) a given population consumes and absorbing the CO<sub>2</sub>e emissions they produce, using prevailing technologies (Chambers et al. 2000). In essence, the ecological footprint is an accounting tool to measure the impact of human activity on the planet. At the macro level, if the human footprint exceeds the productive capacity of the biosphere then consumption patterns are clearly not sustainable. The ecological footprint directly acknowledges that there are limits constraining the function of ecological systems and services and assesses where we are in relation to those limits.

#### **Ecological Footprint Metaphor**

The metaphor of the ecological footprint conveys very clearly that we have a finite amount of ecological productivity or natural capital to support human activity. More so, the metaphor evokes some very powerful messages. If we only have so much space and I over-consume, how does that impact ecological sustainability? What does that mean for future generations? What does that mean for other people living on the planet now? Does overconsumption in one region necessitate poverty elsewhere?

While the ecological footprint is an indicator of sustainable consumption, important factors other than consumption habits influence the ecological footprint. These include population size, technology, and gains or losses in eco-efficiency. For example, new technologies such as zero-emission vehicles, or a reduction in population are factors which could lower Saskatoon's overall ecological footprint.

## **Global hectares**

The ecological footprint expresses results in global hectares. A global hectare is a standardized unit to account for the fact that different land types and different land categories have different productivity or biocapacity potentials. A common unit allows for the meaningful summation of different land types and categories and also allows for meaningful comparisons of footprint results between regions and countries. Land types are adjusted, reflecting the fact that land types (for example, agriculture land) have different productivity potentials depending on the region. Productivity potential can vary both within a country and across countries. The productivity potential of the different land categories are also converted to global hectares so the different land categories can be summed into a total ecological footprint value. For example, cropland in the ecological footprint methodology is considered to be more productive than pasture land. The land category conversion factors are based on global scientific data and updated by the Global Footprint Network (Ewing et al., 2010).<sup>5</sup>

## **Calculation methodology**

The 2014 Saskatoon ecological footprint update adopts a top-down/ bottom-up approach to estimate the ecological footprint. The portion of the ecological footprint associated with direct household energy use and personal transportation is calculated directly based on data specific to the City of Saskatoon. The remaining footprint categories are estimated following the sub-national ecological footprint calculation proposed by Wilson and Grant as a consistent calculation strategy for Canadian communities (2009). The approach adjusts the Canadian National Accounts developed by the Global Footprint Network (2010) using the consumption expenditure model developed to assess the ecological footprint of Canadian municipalities by Wilson and Anielski (2004) and refined by Wilson and Grant (2009) and Wilson, Tyedmers and Grant (2013). The sub-national footprint calculation strategy estimates ecological footprint categories based on proxies for the major consumption categories of the ecological footprint: food, shelter, mobility, goods, services, and government. The respective categories are described here. For detailed calculations, please refer to The Saskatoon Ecological Footprint Calculation Spreadsheets. The spreadsheet file is available upon request.

## **Consumption categories**

### ***Goods and services***

The goods and services category is adjusted using household expenditure data on goods and services from the Statistics Canada Survey on Household Spending. Expenditure data is adjusted by the Consumer Price Index to ensure constant dollars. Expenditures on goods and services as reported in the Survey of Household Spending include: household operation, household furnishing and equipment,

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<sup>5</sup> The Global Footprint Network (GFN) is the global authority on the ecological footprint. GFN coordinated the development of and maintains the ecological footprint calculation and reporting standards. In addition, GFN reports the National Ecological Footprint Accounts annually. Their website, [www.globalfootprintnetwork.org](http://www.globalfootprintnetwork.org), is an excellent clearinghouse for ecological footprint information.

clothing, health care, personal care, recreation, reading materials and other printed matter, education, tobacco products and alcoholic beverages, games of chance (net), miscellaneous expenditures.

### ***Shelter – energy***

The shelter energy footprint refers to the direct energy demands associated with electricity consumption and home heating. Electricity and natural gas consumption data were converted to greenhouse gas (GHG) emissions using conversion factors provided the City of Saskatoon (2015a). Greenhouse gas emissions were converted to global hectares using the footprint intensity of carbon conversion factor from the Global Footprint Network calculation standard (2009). Historic city level electricity and natural gas consumption data were provided by the City of Saskatoon.

### ***Shelter – non energy***

The non-energy component of the shelter footprint refers to the construction, maintenance, and other material inputs to support shelter. To adjust the shelter-non energy component we compare the dwelling space occupied per person by dividing the number of rooms per dwelling by the number of household members. Rooms per dwelling data are from the Statistics Canada Census.

### ***Transportation***

The portion of the transportation footprint attributed to private transportation was updated based on expenditure on gasoline and other fuels. Prices were adjusted using the Consumer Price Index for gasoline to ensure constant dollars. Greenhouse gas emissions associated with transit were provided directly by the City of Saskatoon. Greenhouse gas emissions were converted to global hectares using the Global Footprint Network standard conversion factor (GFN 2009). Emissions associated with air travel were adjusted based on expenditure on airlines from the Survey of Household Spending. Prices were adjusted using the Consumer Price Index for airplane to ensure constant dollars. The ecological footprint associated with rail is assumed to be consistent with that of Canada.

### ***Food***

To adjust the food footprint we use expenditure on food as a proxy of food consumption. Food expenditure data is adjusted by the Consumer Price Index to ensure constant dollars.

### ***Government***

To adjust the government component of the ecological footprint we use expenditure on municipal and provincial government services as a proxy. Federal government expenditures would be consistent across the country. While government expenditures may vary by region within a province and a city, government services such as roads, schools, health care, garbage collection, and snow removal serve all citizens of the city.

01-5536-103 - SASKATOON ENVIRONMENTAL ADVISORY COMMITTEE - 2016 BUDGET - \$6,800								
DATE	NUMBER	DESCRIPTION	DEBIT	CREDIT	BALANCE	GL	TOTAL SPENT	BUDGET REMAINING
		Beginning Balance						\$6,800
Nov. 17/16	R553783	Saskatoon Public School Division - 2016 Funding for Student Action for a Sustainable Future Program support	1050		1050		1050	5750
Dec. 12/16	R572688	Greater Saskatoon Catholic Schools - 2016 Funding for Student Action for a Sustainable Future Program support	750		750		750	5000
Dec. 19/16	R572693	Unite Digital Marketing Co-operative - SEAC Promotional Strategy and video	4950		4950		4950	50

<b>2016 Budget</b>		
Publications/State of the Environment Report/Annual Report		100
Conferences and Workshops		500
Public Education/Information Gathering		6,000
Membership Fees		200
<b>2016 Total</b>		<b>6800</b>
<b>2016 Forecast</b>		<b>6800</b>
<b>2016 Variance</b>		<b>0</b>