



2014

EDMONTON'S REPORT ON THE ENVIRONMENT

SUPPORTING THE WAY WE GREEN

Edmonton

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WHAT IS THE WAY WE GREEN?



The Way We Green is the City of Edmonton's environmental strategic plan. It sets out principles, goals, objectives, policies and approaches for Edmonton to live in balance with nature.

ENVIRONMENTAL MANAGEMENT AND STEWARDSHIP

The City of Edmonton is committed to environmental sustainability and effective environmental management. To do this we need many tools. *The Way We Green* is the City of Edmonton's environmental strategic plan. The plan was approved by City Council in 2011 and outlines principles, goals, objectives, policies and approaches to preserve and sustain Edmonton's environment. *The Way We Green* encourages Edmontonians to understand nature's limits and live within them. It also encourages Edmontonians to pursue a vision of sustainability, defined as "society's ability to endure over a prolonged period as an integral part of Earth's natural systems" and resiliency, defined as "having the capacity to withstand and bounce back intact from environmental disturbances". This strategic plan presents a holistic approach to Edmonton's environment and includes the themes of Land, Water, Air, Energy and Climate Change, Food and Solid Waste.

The Way We Green is Edmonton's over arching strategy on the environment. Supporting the strategy are detailed initiatives and plans focused on specific environmental challenges that Edmonton faces, such as:

- Urban Parks Management Plan
- City of Edmonton Wetland Strategy
- River for Life Strategy
- Green Building Plan
- City Operations Greenhouse Gas Management Plan
- Sustainable Fleet Management Plan
- Sustainable Purchasing Plan
- fresh - Edmonton's Food and Urban Agriculture Strategy
- Waste Management Strategic Plan
- and many more.



This symbol refers to measures that belong to the City of Edmonton and relate to City Operations.



This symbol refers to community measures, those that broadly measure the state of the environment within Edmonton and which all citizens have an impact on.

DYNAMIC AND ADAPTIVE: The City of Edmonton Condition Indicators and Measures are not final or exhaustive in character; they need to be regularly refined as scientific knowledge improves, programs are developed, policies shift and data availability increases.

The work outlined in all of these strategies, plans and initiatives, as well as others currently being developed, is needed for effective environmental management and sustainable development in Edmonton.

The City of Edmonton also has an Environmental Policy (C512) that commits the City to prevent pollution; to continually improve its environmental performance; and to meet or exceed environmental legal requirements. One way the City does this is through Enviso, the City's ISO 14001 environmental management systems.

ISO 14001 is the International Standard for Environmental Management Systems. It identifies the process of building an environmental management system, and requires that each system be governed by a Plan-Do-Check-Act model, in order to ensure continual improvement and adaptive management. The City has annual independent third-party audits and certification of each system. In 2014, twelve areas of City operations received and maintained ISO 14001 certification for their Enviso Systems: Community and Recreation Facilities; Community Standards; Fire Rescue Services; Neighbourhoods Branch; Fleet Services; Drainage Services; Waste Management Services; LRT Design and Construction; Roads Design and Construction; Buildings Design and Construction; Transportation Operations; and Transportation Planning.

Leading the City's continual environmental improvement is the Environmental Management Steering Committee, made up of leaders from different areas of City operations. This committee develops, executes and oversees the City operation's Environmental Management Business Plan, which drives and governs various environmental initiatives throughout City operations.

The City seeks input from a range of sources. Since 1995, the City has received guidance from a citizen Environmental Advisory Committee (EAC). The citizens on the EAC meet monthly to provide insight and advice to the City on environmental issues, representing a community voice in City decision-making. The EAC has advised the City on several different subject areas, including:

- Green Building Policy
- Energy Transition Plan
- Community Engagement: Neighborhood Level
- Permitting/Zoning Alternative Energy Technology
- City of Edmonton Internal Greenhouse Gas Reduction Plan
- River Access Strategy
- Neighborhood Action Plan
- Brownfield Redevelopment Grant
- and many more.

The EAC has also provided advice to the City for the continual improvement of this report.

Edmonton's Report on the Environment is intended to report on the performance of the City of Edmonton's overall environmental management. Monitoring, understanding and reporting on the state of Edmonton's environment and progress are important for continual environmental improvement. Measuring and tracking changes in our environment can help decision makers and citizens understand issues of concern, priorities, successes or failures, and is a step towards raising environmental awareness.

As part of this continual improvement process, the City of Edmonton encourages feedback from citizens on the report. If you have any feedback or comments you would like to share, please send them to thewaywegreen@edmonton.ca.

MESSAGE FROM MAYOR DON IVESON

City Council has set the goal of being the nation's leader in setting and achieving the highest standards of environmental preservation and sustainability. Edmonton's Report on the Environment is intended to communicate to citizens and decision makers the progress being made towards that goal, both at a City operations and at a community level. The environmental impacts of daily activities must be measured, evaluated and reported if they are to be effectively managed. Understanding the condition of our environment helps us make choices to lessen our impact and implement systems and programs to mitigate adverse effects. A healthy urban environment contributes to a rich quality of life for all Edmontonians.

Monitoring the overall environmental condition of Edmonton and measuring the successes of City programs that have been designed to protect and preserve the environment are crucial to becoming a sustainable community. Reporting on the state of our environment on a continual basis communicates movement towards improvements to Edmonton's environment. While Edmonton's environment has changed significantly for the better since the 1990s, continual improvements are always necessary. This report provides the opportunity to better the environmental management of the City and ensure the necessary progress is being made.

It is Council's hope that this report will not only contribute to informed decision making amongst City administrators but also engage citizens to take action to improve Edmonton's environment and reduce their own ecological footprint. The state of Edmonton's natural environment is integral to the citizens of Edmonton, as it directly impacts the health, quality of life and resiliency of our citizens and our city. Everybody in our city has a role to play in improving the state of Edmonton's environment.



Mayor Don Iveson
City of Edmonton

NATURE AND BIODIVERSITY

THE WAY WE GREEN GOAL:

Edmonton's communities are full of nature — a place where in the course of everyday life, residents experience a strong connection with nature.

Tree Health Assessment Program

The shining green gem in Edmonton's cap is what we affectionately call our Urban Forest. Filled with millions of trees, it is a considerable asset that both citizens and City officials are proud to call their own. Within that tree canopy, there are 314,000 ornamental trees that beautify Edmonton's streets, parks and neighbourhoods. To ensure their health and longevity, the Urban Forestry team conducts a Tree Health Assessment on half of these trees each year. Trees that are in poor health or need to be removed are noted. From this information, which has been captured since 2001, a planting list is created. In 2014, 1,900 trees were removed and 3,350 trees were replaced.

The City's Pest Lab also uses this information to monitor for tree pests and diseases. Using the principles of integrated pest management, the team decides the best methods of treatment. To ensure the sustainability of Edmonton's Urban Forest, the Root for Trees program aims to plant an additional 16,000 trees each year. Since 2013, over 150,000 trees and shrubs have been planted through the planting activities of City staff, and ongoing partnerships with corporations, volunteers and community groups.



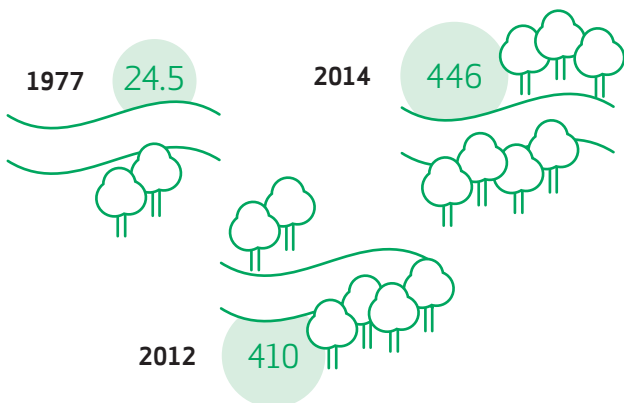
WHAT IS A TABLELAND?

Tableland natural areas are the upland areas above the North Saskatchewan River Valley and Ravine System. Natural areas consist of land or water that is dominated by native vegetation in naturally occurring patterns. Such areas could include grasslands, forests, wetlands, peatlands or riparian areas. Areas such as groomed parks, sports fields and schoolyards are not natural areas.

TOTAL PRIORITY NATURAL AREAS SECURED

The City of Edmonton continues to make advances in securing tableland natural areas (i.e. those areas found outside of the North Saskatchewan River Valley and Ravine System). As of the end of 2014, 446 ha of tableland natural areas have been secured. This has been tempered by the loss of approximately 25 ha per year of natural areas, due to City growth.

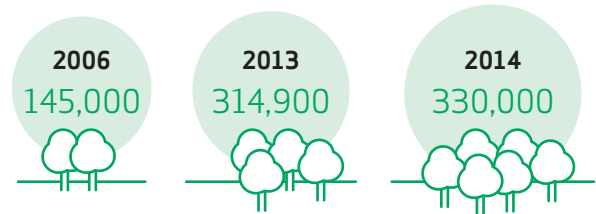
LAND SECURED FOR NATURAL AREAS
Hectares



City-Maintained Trees

The inventory of City-maintained trees continues to grow each year. Although current tree planting endeavors play a significant role in maintaining the tree canopy, additional strategies are required to increase the canopy to meet targets in the Urban Forest Management Plan. To that end, the City has launched an enhanced tree planting initiative called Root for Trees.

NUMBER OF TREES MAINTAINED BY THE CITY
Trees



WHAT IS A CONSTRUCTED WETLAND?

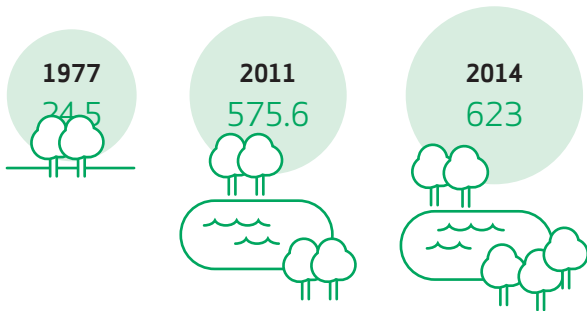
Constructed wetlands are an integral component of Edmonton’s storm water management strategy, while also providing habitat and urban biodiversity. Increasing the connections between natural areas and constructed wetlands improves ecological integrity while providing important ecological services.

WHAT IS INTEGRATED PEST MANAGEMENT (IPM)?

All forms of pest management activities on City property follow the principles of Integrated Pest Management (IPM). This means a variety of preventive and non-chemical pest management strategies are used or considered before using the least toxic approved pesticide. A common IPM strategy used by the City includes invasive weed pulls.

LAND SECURED FOR NATURAL AREAS & CONSTRUCTED WETLANDS

Hectares

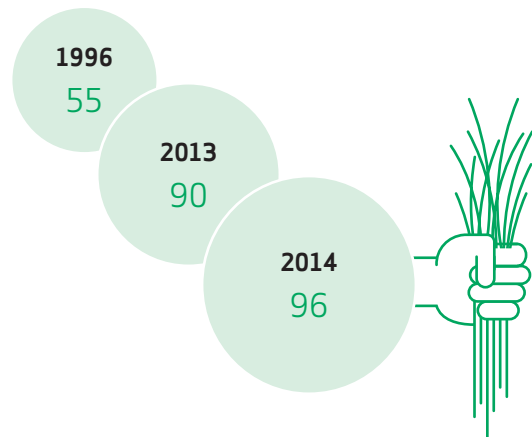


Pesticide Alternatives

This measure refers to the proportion of City-owned and managed turf areas where alternative integrated pest management measures such as mowing, digging and hand-pulling were utilized to control weeds.

TURF AREAS WHERE ALTERNATIVES TO HERBICIDES WERE USED

Percentage



One Weed at a Time

Daniel Laubmann spends his weekdays working for the City of Edmonton as an Environmental Technician but on the weekends he is hunting. Not for deer or elk, but rather for the Himalayan balsam. This invasive species was first introduced as an ornamental plant in Edmonton, but has since taken over many naturalized areas such as the Kennedale Ravine.

Daniel says weed pulls are important because “invasive species lack the natural balance here. They have no natural enemies and often have traits that will displace native vegetation.” Invasive species also have the ability to “create a monoculture.” Returning to the Himalayan balsam, Daniel explains that bees prefer to pollinate that particular plant over native species, so by reducing the impact of invasive species, we positively impact the biodiversity of the city.

Participating in weed pulls can help citizens learn about invasive weeds and biodiversity in the city. Daniel encourages all citizens to join him and others to restore biodiversity and natural areas in the city.



Naturalization

In 2014, the City continued the process of naturalization. Naturalization is a landscape management technique that allows the landscape to become more natural by planting trees, shrubs and wildflowers that are found naturally in Alberta.

This involves 3 stages:

- 1) Stop mowing.
- 2) Plant trees and shrubs native to Alberta and
- 3) Continue planting smaller native shrubs and flowers to promote a healthy ecosystem.

This process provides economic, environmental and quality of life benefits. The end result is a beautiful, biodiverse, self-sustaining landscape.

TURF AREA NATURALIZED

Hectares



WATER

THE WAY WE GREEN GOAL:

Water quality in the North Saskatchewan River sustains healthy people and healthy ecosystems.

THE WAY WE GREEN GOAL:

Edmonton's water supply meets its needs.



Developers Leading in LID Best Practices

When Holmes Communities looked towards a new development in Edmonton, sustainability was always in the back of their minds. They looked for land that could include overland drainage and the proper use of bio-swales and rain gardens in the development of each community.

They believe this is “making the best use of the earth’s precious resources.” Holmes Communities is also concerned about water use, especially considering recent floods and droughts in Alberta. Several rain gardens are planned for the community. Rain gardens are depressions that have selected soils and plants that help naturally and slowly filter rainwater and storm water runoff before it enters the storm water system, diverting pollution from local waterways.

The rain gardens at Creekside Ravine are composed of native Alberta plants such as: Blue Fox Willows, Snowberry and Dwarf winged burning bush. Not only do the rain gardens provide esthetic appeal, but they positively impact the local waterways and ecosystem. They believe Creekside Ravine sets a precedent in sustainable community design, as Creekside Ravine is the first development in Edmonton to incorporate rain gardens into its community design.

WHAT IS LOW IMPACT DEVELOPMENT (LID)?

As Edmonton grows and more land is developed in the city and surrounding areas, function of the natural water cycle is altered. Low impact development (LID) mimics natural hydrology (movement of water) by managing storm water close to its source. Wherever possible, natural landscape features that contribute to local hydrology are preserved and incorporated into urban design.

Benefits:

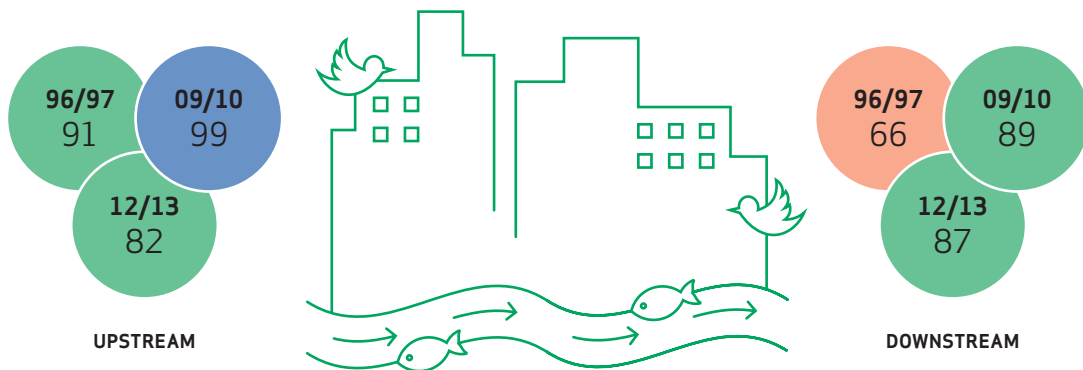
- Improves watershed health by decreasing pollutants from urban development to surrounding watercourses
- Provides green spaces that contribute to wildlife habitat and ecological corridors
- Decreases urban heat island effects (urban areas that are warmer than rural areas)
- Reduces heating and cooling energy requirements



THE ALBERTA RIVER WATER QUALITY INDEX

The Alberta River Water Quality Index was developed as a way to summarize physical, chemical and biological data into a simple descriptor of water quality. The index provides a simple snapshot of annual water quality conditions in major rivers of the province, such as the North Saskatchewan River. The index is being evaluated and the Province is in the process of developing a more relevant measure that will better capture seasonality associated with changes in water quality. As such, the most recent data for the measure is from 2012/2013. In 2012/2013, the River Water Quality Index showed that the quality of water coming into Edmonton was Good and the downstream river water quality in the North Saskatchewan was also Good. The overall trend seen over the years is improved downstream water quality from Edmonton.

RIVER WATER QUALITY IN THE NORTH SASKATCHEWAN RIVER



EXCELLENT 96 - 100	GOOD 81 - 95	FAIR 66 - 80	MARGINAL 46 - 65	POOR 0 - 45
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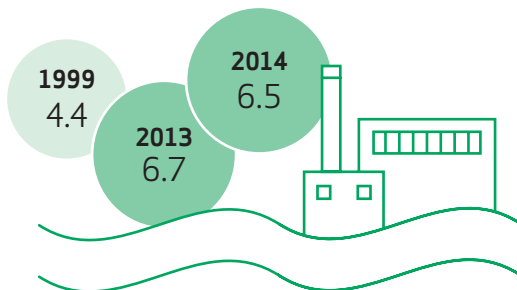


Edmonton's Watershed Contaminant Reduction Index

Edmonton's Watershed Contaminant Reduction Index (EWCRI) is an annual measure of the contaminants discharged to the North Saskatchewan River from the City of Edmonton, adjusted for population. The index is calculated using the measured amounts of sediments, nutrients and bacteria discharged to the river, referenced to a baseline. Sources of contaminants from the City of Edmonton include wastewater treatment plant, combined sewer overflow sites and stormwater outfalls. An increase in the index is good and means less contaminants are being discharged to the river. A score of 10.0 would result from zero contaminant discharge.

The trend with EWCRI has leveled off in recent years but progress is being made towards reducing contaminant loading to the river through implementation of low impact development and other management programs.

EWCRI FOR THE NORTH SASKATCHEWAN RIVER



GOOD	FAIR	POOR
> 7.45	5.45 - 7.45	< 5.45

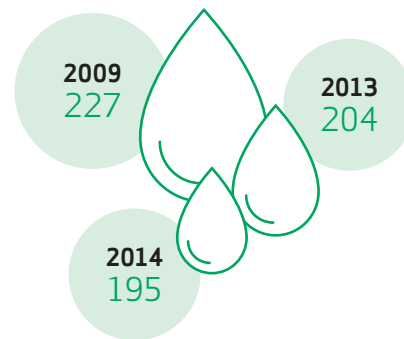


LITRES USED PER PERSON PER DAY

Domestic water use in Edmonton, on a per person basis, has historically been lower than the Canadian average due to its well established metering program, public education, rate setting methods and relatively short summers. Water use per person in Edmonton continues to decrease due to the continued installation of high efficiency toilets and clothes washers.

WATER USED PER PERSON PER DAY

Litres



The Muttart Conservatory is Harvesting Rainwater

At the Muttart Conservatory, there's a new appreciation for rainy days. One of the Conservatory's greenhouses will soon be capturing rainwater from the roof. This water will be filtered and saved in cisterns holding up to 9085 litres.

The water will be used in flood tables, innovative growing tables that water plants at the roots, rather than from above, and reclaim water for reuse. Water stored in the Muttart Conservatory cisterns could also have nutrients added before the plants are watered.

Plants watered by this system will be used in the pyramids, and for annual flower and poinsettia crop production.

Among its many benefits, this project reduces the Muttart Conservatory's need for municipal water, and can lessen the impact of storms on nearby sewers. Ultimately, it reduces the Conservatory's carbon footprint.

The Rainwater Harvesting Pilot Project is a partnership between the Drainage Services and Community and Recreation Facilities Branches of City Operations.



AIR QUALITY

THE WAY WE GREEN GOAL:

Edmonton's air sustains healthy people and healthy ecosystems.



The City of Edmonton's 'Green Thing'

The City of Edmonton's Fleet Services is one of the most diverse and integrated municipal fleet operations in Canada. They ensure that over 5,000 City vehicles, transit buses and essential City operations equipment are well maintained, safe, and reliable for use on a daily basis. Fleet Services employees are committed to environmental excellence.

Fleet Services' Engineering team collaborated with Edmonton Transit System (ETS) to create an emissions-testing program for the City's fleet of over 900 transit buses. Fleet Services researched a new hand-held unit called the "Green Thing" which analyzes five different gases from a bus' tailpipe and developed a program in-house that compares the emissions to standards set by the Environmental Protection Agency and Environment Canada. The program helps to evaluate the health of the bus fleet and ensures Edmonton's air quality is sustained.

Helping to Improve our Air

The Alberta Capital Airshed (ACA) is one of the nine airsheds in the province of Alberta. The ACA has 3 main functions: air quality monitoring, managing air quality issues and educating about air quality.

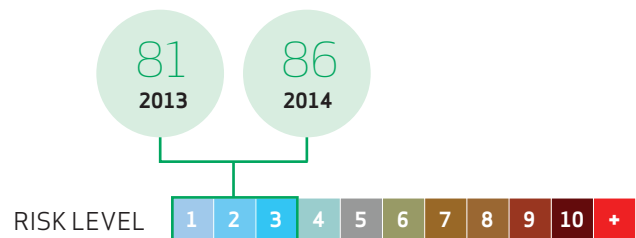
The ACA education program spreads different information about Edmonton's air quality through their website and presentations to different groups. Some of the information the ACA shares is about the contaminants that pollute the air and what are the health impacts of those pollutants. The ACA also uses the Air Quality Health Index to help Edmonton residents to understand the appropriate measures to reduce contact with harmful pollutants.

Gary Redmond, the executive director of the ACA, says that for him, the intersection of sustainability and air quality are found between the complex problem of having both successful industrial development and healthy urban environments.



PERCENTAGE OF DAYS WHERE AIR QUALITY HEALTH RISK IS LOW

DAYS WHERE AIR QUALITY HEALTH RISK IS LOW
Percentage





Air Quality Monitoring Network

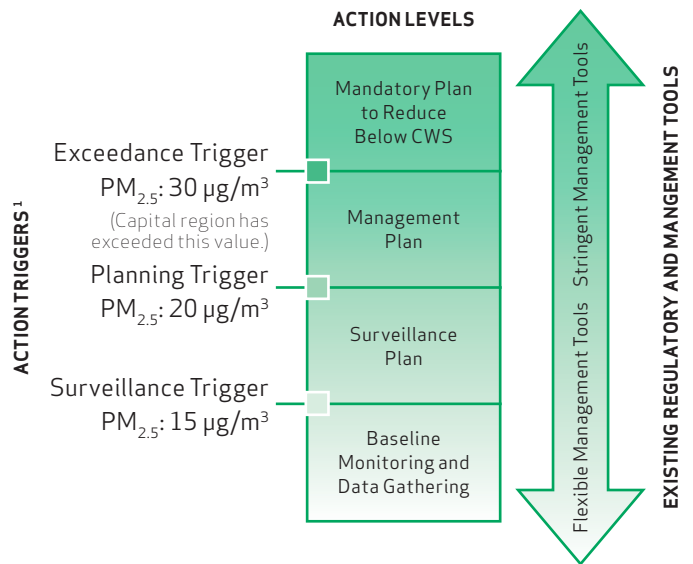
Edmonton’s ambient air quality monitoring network is operated by the provincial government and various industrial operations. In 2014 there were seven monitoring stations in the network. The stations monitor various pollutants such as: Carbon Monoxide, Particulate Matter, Nitrogen Oxides, Ground level Ozone, Sulphur dioxide, Hydrogen sulphide, Methane and Total Hydrocarbons.



EDMONTON’S AIR QUALITY CHALLENGE: PARTICULATE MATTER

There are many sources and factors that impact Edmonton’s air quality, such as various emissions, pollutants and even weather. Like many large cities, there are days when air quality in Edmonton is worse than other days, and on some days Edmonton’s air quality has exceeded federally set limits for Fine Particulate Matter (a pollutant). Exceeding these limits required the provincial government to lead the development of a plan to reduce levels below the limits. In December 2014, the Alberta Government completed the Capital Region Fine Particulate Matter Response Plan to reduce ambient fine particulate matter concentration. The City of Edmonton participated in the development of the response plan and identified 26 actions that the City of Edmonton is currently undertaking that may help reduce emissions that contribute to fine particulate matter concentrations. Examples of City actions include expansion of the LRT, the requirement for LEED Silver civic building and the City’s Green Home Guide.

ACTION LEVELS OF PARTICULATE MATTER



¹ Action triggers for PM_{2.5} are based on a 24-hour average, and achievement is based on 98th percentile ambient measured annually, averaged over three consecutive years.

ENERGY AND CLIMATE CHANGE

THE WAY WE GREEN GOAL:

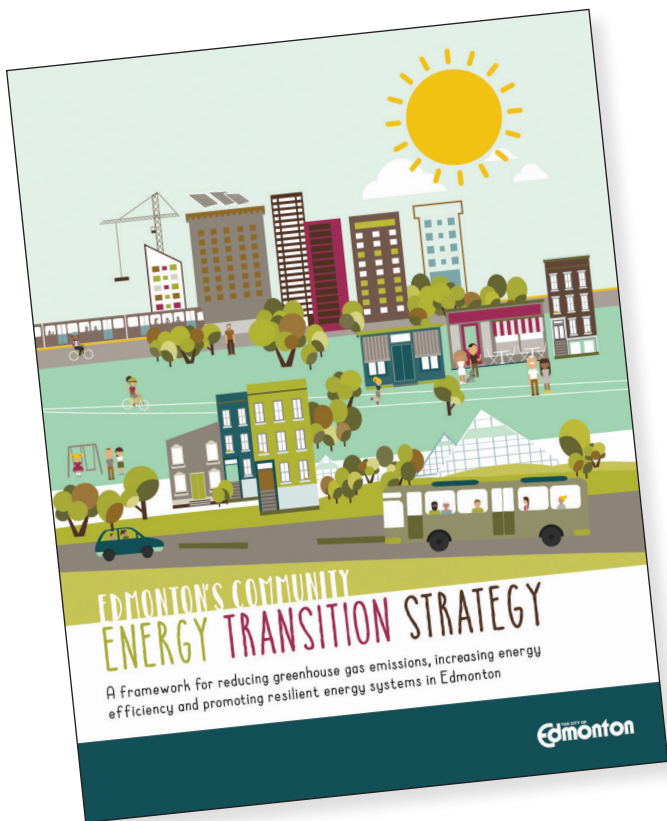
Edmonton's sources and uses of energy are sustainable.

THE WAY WE GREEN GOAL:

Edmonton is a carbon-neutral city.

THE WAY WE GREEN GOAL:

Edmonton is resilient to disturbances from climate change.



Energy Transition Strategy

Currently, Edmonton is dependent on non-renewable energy (mainly coal for electricity, natural gas for heating and gasoline and diesel for transportation fuel). While there is a movement towards energy conservation and efficiency and a growing awareness of a need to transition to alternative energy sources, significant effort is required to take action on a community scale.

How will Edmonton transition to more renewable and reliable energy sources? The City of Edmonton has an Energy Transition Strategy, developed in consultation with citizens and industry stakeholders that sets the following targets:

- 1) Reduce community-based greenhouse gas emission by 35% by 2035 (compared to 2005 levels)
- 2) Reduce energy consumption by 25% per person by 2035 (compared to 2009 levels)
- 3) Generate 10% of Edmonton's electricity locally by 2035.

The strategy outlines strategic actions and programs that the City will implement to achieve these targets, such as programs that support energy conservation, efficiency and renewable energy uptake in buildings, and programs that encourage a shift from vehicles that use gasoline and diesel to vehicles that use electricity.

More information on the Strategy can be found at: edmonton.ca/energy

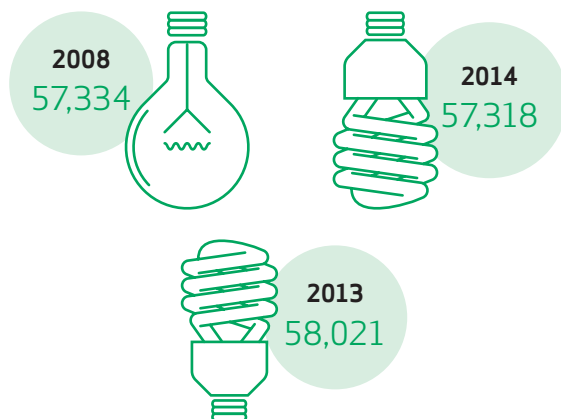


ENERGY USED PER PERSON IN EDMONTON

The total amount of energy used per capita within the boundary of the City of Edmonton is a measure of the efficiency of energy used. This measure includes vehicle fuel, natural gas and electricity. Energy used per person in Edmonton has fluctuated minimally since 2008, and is currently almost identical to the 2008 value.

ENERGY USED PER PERSON PER YEAR

Kilowatt hours equivalent

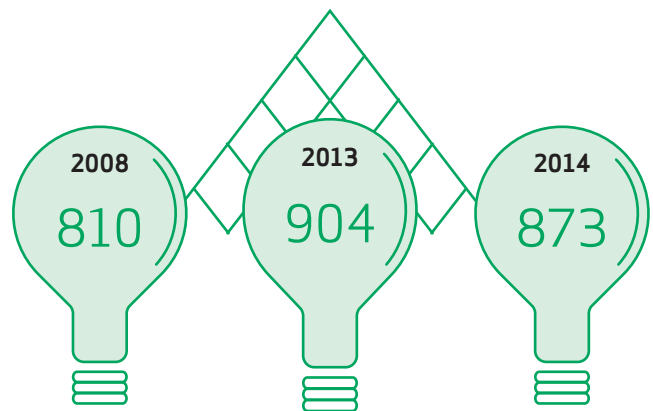


Total Annual Energy Used in City Operations Per Capita

The total amount of energy used by the City of Edmonton, excluding Edmonton Transit Building and Vehicle energy use, provides information on the relative contribution of City operations to the overall energy footprint of the community. This includes vehicle fuel, heating and electricity use. Energy use in City operations has increased in response to the exceptional growth the City has seen in recent years.

CITY OPERATIONS ENERGY USED

Kilowatt hours equivalent per capita*



City Operations Green Power Purchase

Annual purchases of green power (from renewable energy sources) will assist the City of Edmonton in achieving a 50% reduction in its greenhouse gases (GHG), a target set out in the City Operations Greenhouse Gas Management Plan (approved in June 2013). The amount of green power purchased will increase proportionally from 2013 to 2020, contributing to a goal of 150,000 GHG reduction by 2020. Our 2014 green power purchase resulted in 10% of our electricity coming from green sources.

*This infographic was updated on October 2, 2015.

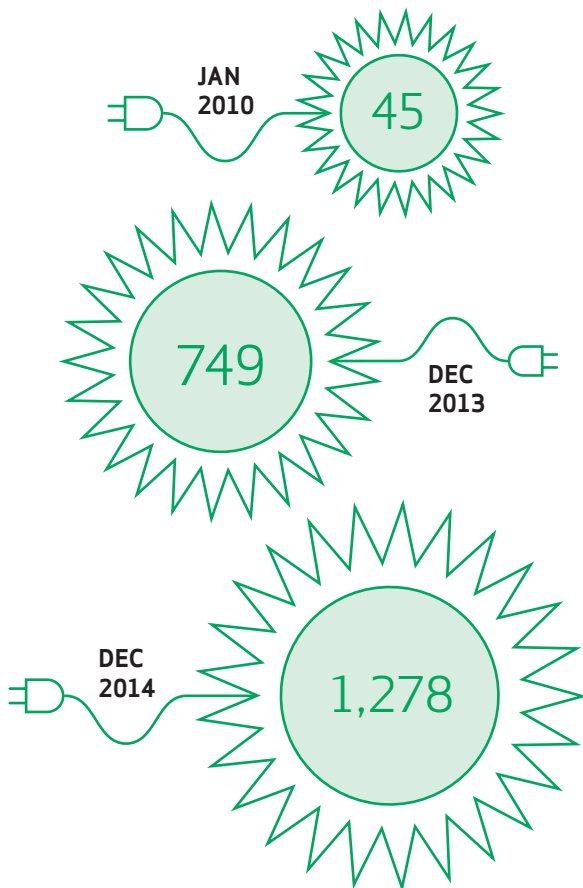


Solar Electricity

The amount of solar photovoltaic (PV) installed provides an indication of the amount of low carbon and local electricity that is being added to the Edmonton area annually. Increasing solar energy generation is a goal of *The Way We Green* and can be an indicator of the increasing diversity of our energy system. As solar PV becomes more affordable, installations are increasing at an accelerated rate.

INSTALLED CAPACITY OF SOLAR ENERGY (PER MONTH)

Kilowatt hours per month



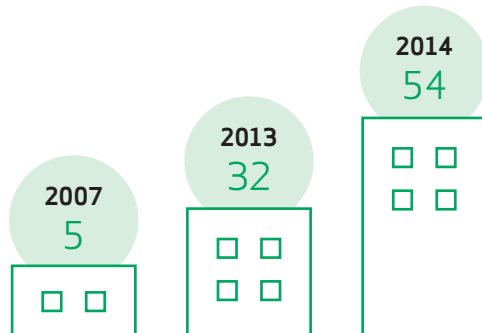
Green Building Rating Systems

There are a number of green building rating systems currently being used in Edmonton including LEED, BuiltGreen Canada™ and EnerGuide. These systems are signs of a shift to a greener building stock. We are seeing increased market uptake of third party rating systems. This shows that people are valuing measureable sustainability improvements in the residential and commercial markets.

YEARLY NUMBER OF BUILTGREEN CANADA CERTIFIED HOMES



TOTAL NUMBER OF LEED CERTIFIED BUILDINGS (COMMERCIAL + RESIDENTIAL)



YEARLY NUMBER OF ENERGUIDE LABELLED HOMES



WHAT ARE GREENHOUSE GASES (GHGs)?

Greenhouse gases (GHGs) are gases that absorb and trap heat in the atmosphere. Carbon dioxide (CO2) is the main naturally-occurring GHG. The most common human-produced GHGs are CO2, methane (CH4) and nitrous oxide (N2O). GHG emissions result from the burning of fossil fuels for residential and industrial purposes (producing mainly CO2), from agricultural and oilfield activities (mainly CH4) and from vehicle emissions (mainly CO2 and N2O).

GHGs are also emitted from natural sources such as volcanoes and forest fires. Water vapour is another important GHG. All GHGs released to the atmosphere contribute to the greenhouse effect, regardless of where in the world they are emitted.

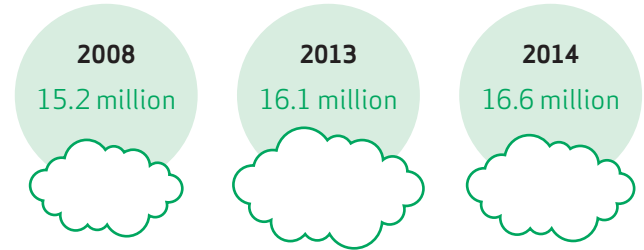


COMMUNITY GREENHOUSE GAS EMISSIONS

The City monitors greenhouse gas trends to know Edmonton's relative contribution to climate change. Climate change is currently largely being driven by human emissions of CO2 and other gases that contribute to the atmospheric greenhouse effect. The total amount of greenhouse gas emissions is derived from the emissions of landfills and the use of fossil fuels (natural gas, grid electricity and vehicle fuels) within the City of Edmonton boundary. Edmonton continues to grow, and without lifestyle and infrastructure changes, so do the greenhouse gas emissions emitted within city boundaries.

COMMUNITY GREENHOUSE GAS EMISSIONS

Tonnes of carbon dioxide equivalent*



* updated to reflect accounting changes



City Operations Greenhouse Gas Emissions

City Operations Greenhouse Gases measures the amount of greenhouse gas (GHG) emissions from four main City operations sources: City buildings and facilities, streetlights, landfill waste degradation and the municipal fleet, but does not include emissions from Edmonton's Transit fleet and buildings or Edmonton Police Service's fleet. The measure also includes an estimate of the reduction in GHG emissions that is generated by the trees the City maintains and from renewable energy credits purchased. The continued development of the city has required an increased level of City services in urban growth areas, however due to Green Power Purchase offsets, greenhouse gas emissions for City operations have been variable since 2008. City operations produced approximately 2% of total community greenhouse gas emissions in 2014.

CITY OPERATIONS GREENHOUSE GAS EMISSIONS

Tonnes of carbon dioxide equivalent*



2020 TARGET = 154,051

* updated to reflect changes in global warming factors

Switching to LED Streetlights

With the flick of a switch, the City of Edmonton is saving money and reducing environmental impacts. Over the next five years, the city intends to convert all 100,000 of its street lights to high efficiency LED bulbs charting a greener path for citizens.

The new LED lamps are more reliable, use just 16 to 200 watts, and save about 35 per cent in both energy costs and greenhouse gas emission spin-offs. About 25,000 are already changed out and once completed, the savings should reach 50 per cent.

The switch also reduces light pollution by adapting lighting to specific locations and times of the day, focusing light only when and where needed. The LED light initiative and Edmonton's Light Efficient Community Policy exceed standards set out by the Transportation Association of Canada and Illuminating Engineering Society of North America.



The Mosaic Centre, Edmonton's Greenest Building

Shafraaz Kaba, architect and partner with Manasc Isaac Architects, and Dennis Cuku, president of the Mosaic Family of companies, are two of the many minds behind the Mosaic Centre, Alberta's first net-zero commercial office space.

Being net-zero means that the Mosaic Centre generates as much energy as it uses throughout the year. This is achieved by a massive photovoltaic scheme, installed on the roof and exterior walls, and a geoexchange system. Together the two systems generate the building's needs for power, heating and cooling.

When beginning the Mosaic Centre project, the team agreed on sustainability as a core value. This core value would help direct a range of decisions about the building. Those decisions included simple things like office windows that open, to more unconventional choices such as using wood as a building material because of its carbon sequestration abilities and installing an advanced energy recovery system.



Dennis Cuku



Shafraaz Kaba

LAND MANAGEMENT AND TRANSPORTATION

THE WAY WE GREEN GOAL:

Edmonton is a carbon-neutral city.



Adapting Roads to a Changing Climate

The relatively short lifespan of roads makes them one of society's most expensive infrastructure. The impact of repairs, repaving and the vast amounts of materials that go into constructing roads also make them environmentally taxing. But the City of Edmonton's Engineering Services staff have worked hard to find a way to make pavement last longer, reducing the impact on the environment, and saving the City millions of dollars.

Making a roadway last longer is no easy task, especially given the 120+ freeze-thaw cycles that Edmonton endures in an average year. But the advent of new laboratory equipment and testing protocols and a powerful new analytical computer application has enabled the City to refine their asphalt mixes to make them more appropriate for Edmonton's conditions.

The City's new Superpave asphalt mixes lose less than 20 per cent strength in one freeze-thaw cycle, and thus weaken more slowly than the older mixes which lost as much as 58 per cent of their strength after just one freeze-thaw cycle.

Edmonton is a leading city with a materials testing facility, and one of only nine jurisdictions in Canada using the software application for evaluations.

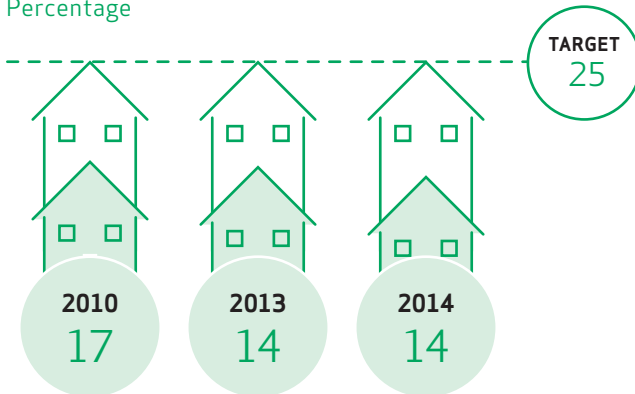
Sustainable land management policies such as encouraging density, brownfield redevelopment, complete communities and integrated land use and transportation planning, can result in significant sustainability gains in terms of reduced energy use, emissions and conservation of natural lands.

 **INFILL**

Residential infill is the development of new housing in established neighbourhoods. This new housing may include secondary suites, garage suites, duplexes, semi-detached houses, row houses, apartments and other residential and mixed-use buildings. These types of developments use land and resources efficiently, which lowers the environmental impact.

Edmonton set a target in The Way We Grow to have 25% of new residential development be infill. This target is not currently being achieved but programs like Evolving Infill and the Brownfield Grant Program are aiming to increase this number in the future.

NUMBER OF RESIDENTIAL INFILL DEVELOPMENTS
Percentage



The 25% target is not representative of the entire infill program, as not all established neighborhoods are included in this target.

 **Brownfield Redevelopment**

A brownfield is a site that is under utilized and where past activities on the site have caused environmental soil and/or groundwater contamination. Brownfields exhibit good potential for other uses and provide economically viable business opportunities.

The City launched a Brownfield Redevelopment Grant in 2011 to provide assistance to property owners, interested groups and developers intent on improving the use of former refueling site brownfields. The grant funds available are designed to assist in Phase I (site assessment), Phase II (testing, analysis, delineation, remediation planning) and Phase III (remediation) costs associated with readying a brownfield for redevelopment. The goal of this grant program is to improve the environmental condition of these former refueling sites by supporting clean up and ideally leading to their redevelopment. The program continued in 2014 to successfully propel remediation and redevelopment of these sites. Since launch, 16 applicants are in the process of being approved or have received grant funding. The grant awards have been used for one or more of the Phases. In 2014, the funding model for Phase III was altered to enable tailoring that incorporates the cost of remediation and the municipal tax uplift projected specific to the site. Some of the brownfield redevelopment projects include, 4 multi-story, mixed-use facility including one with below-market housing; a two tower condominium complex in the downtown area; and a park. The total value of the grants linked to these projects is just over \$6,000,000. The value to the communities of the redevelopment is far greater than that investment.

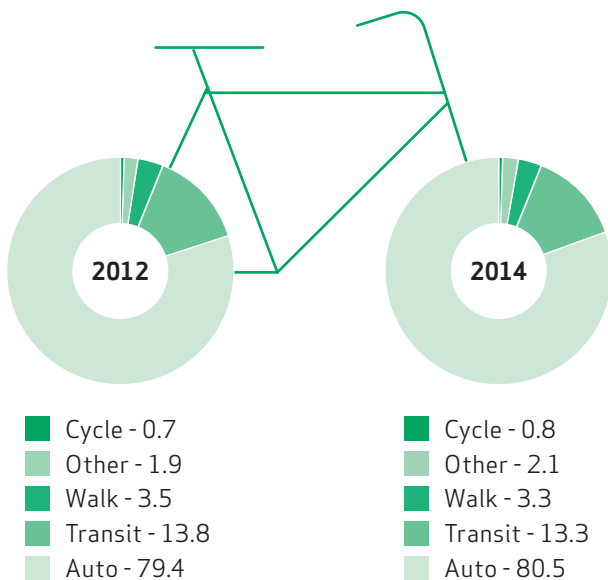


TRANSPORTATION MODE SPLIT

This measure tells us, based on an average day in the city of Edmonton, the proportions of commute to work trips that are made by the various modes of transportation. Although only 26% of daily trips made are commute to work trips, these are the trips that set the traffic pattern for each day, resulting in the periods of vehicle traffic congestion, thus influencing the capacity requirements of the transportation network.

Generally we are trending favorably in this measure. Data is now available every two years through the Edmonton Municipal Census allowing for a greater ability to track trends.

MODE OF TRANSPORTATION FOR COMMUTE TO WORK Percentage*



* The survey methodology used to obtain the 2012 and 2014 data for this measure differed slightly in that in 2012 the Journey to Work mode question was asked only of those residents who identified as "Employed 0-30 hours" or "30+ hours". However in 2014 the question was asked of all residents age 12 or older. For comparability purposes, the 2014 data shown here includes only those residents who identified as "Employed" (full time or part time).



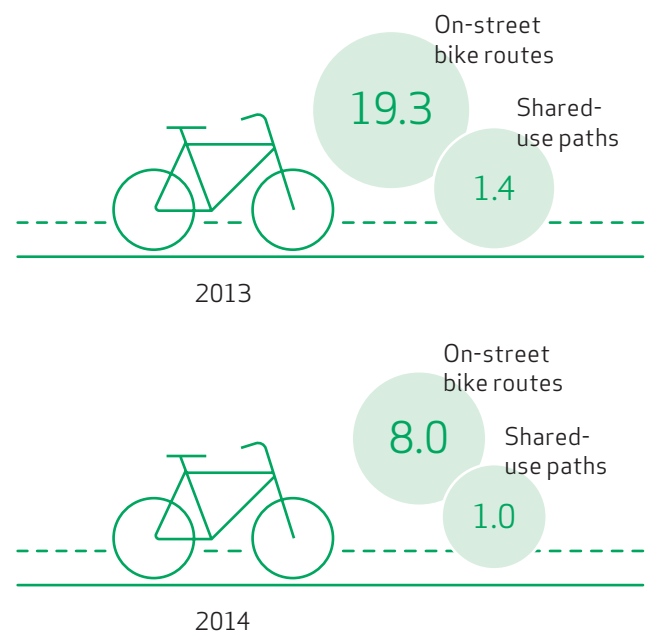
Bike Infrastructure

The City of Edmonton seeks to increase the use of active modes facilities by:

- decreasing the proportion of missing sidewalks in existing areas of the city
- increasing the number of shared use paths constructed in existing areas of the City
- increasing the proportion of total planned kilometres of on-street cycling facilities constructed

Cycling is a great way to travel more sustainably. It also provides the perfect opportunity to stay active and adopt a healthy living lifestyle. Building active mode infrastructure in our transportation system contributes to making our city safer and more accessible.

WALKING, BIKING, AND ACCESSIBILITY INFRASTRUCTURE Kilometres*



*The numbers represent kilometers constructed yearly.

Community Leaders in Sustainable Transportation

The Edmonton Bicycle Commuters Society (EBCS) is a non-profit organization run by Edmontonians who are committed to promoting cycling in our city. EBCS offers many services for individuals who are looking to start cycling or to increase their safety and comfort on the road. It will organize presentations for workplaces and community groups on cycling to work, help to map out bike routes for individuals and hold workshops on do-it-yourself bike maintenance and riding topics.

EBCS runs two community bike shops in Edmonton: BikeWorks North and BikeWorks South. At these shops you can get help tuning your bike, buy an affordable used bike or purchase new parts for your bike. You can visit them at edmontonbikes.ca.

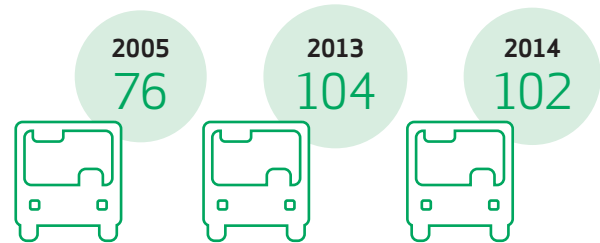
Transit Ridership

This measure tells us how many rides are made annually on transit (both buses and LRT) as a rate proportional to Edmonton’s population. Ridership per capita is an indication of the effectiveness of Edmonton’s public transit, which is one of the most efficient means of transporting large numbers of people in an urban environment. Increasing transit ridership per capita means that more people are taking transit and implies that a greater proportion of daily trips are being made by transit.

In 2014, transit ridership was 102 rides annually per capita. Through a mode shift to transit and increase in travel activity over 10 years, the City’s target is to increase transit ridership to 107 rides per capita by 2020.

TRANSIT RIDERSHIP

Per capita

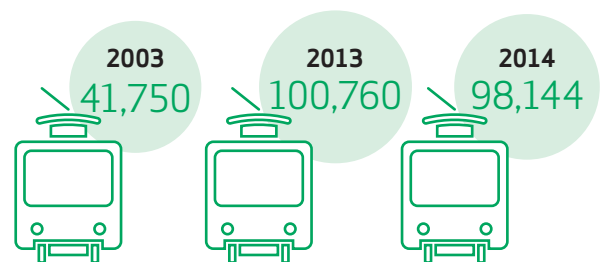


LRT Ridership

The City aims to continue its expansion of the LRT network. The Metro Line will open in 2015 and the future Southeast to West LRT (Valley Line) will be a low-floor urban line that will run from Mill Woods to Lewis Farms, crossing through downtown. Over the past 10 years, LRT boardings have grown by 132.5%.

LRT PASSENGERS DAILY

Trips per day



WASTE

THE WAY WE GREEN GOAL:

Edmonton generates zero waste.



City Opens Kennedale Eco Station

To have an Eco Station ready to serve residents in each quadrant of the City, in 2014 Edmonton was busy constructing the new Kennedale Eco Station located in 5355-127 Avenue. Eco Stations are convenient waste drop-off facilities for electronics, household hazardous waste (HHW) such as paint, batteries and light bulbs, and items too bulky to be left for curbside collection. Eco Stations play an important part in Edmonton's waste management system as they keep HHW out of landfills. By taking HHW to Eco Stations residents are helping to protect the environment by ensuring such items are properly disposed of or recycled. Since its opening in March 2015, the Kennedale Eco Station has been used by many residents and received the equivalent of 10 tanker trucks of used motor oil, 150 bathtubs worth of paint and enough light bulbs and fluorescent tubes to line Whitemud Drive twice.



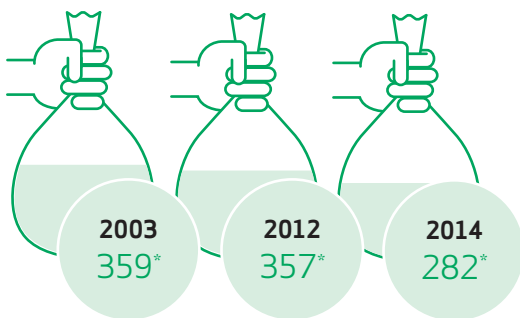
WASTE PRODUCED PER PERSON WITHIN EDMONTON

Edmontonians all produce waste. Opportunities to recover and utilize waste as a resource are increasing but the need to reduce our waste still exists if we are to advance towards zero waste.

Waste reduction practices such as reuse, recycling, backyard composting and grasscycling (leaving the clippings on your lawn when you mow), as well as safe household hazardous waste disposal, all contribute to waste reduction.

RESIDENTIAL WASTE COLLECTED PER PERSON

Kilograms per person per year



*This includes recyclables and household waste



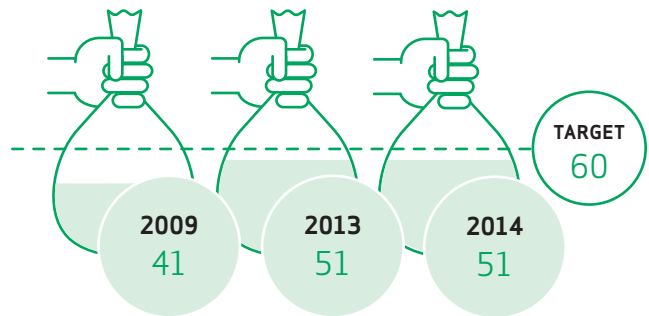
Diversion of Waste From Landfill

Residential Waste Diversion measures the percentage of residential waste kept out of landfill. As a result of Edmonton's world class waste management system and residents' participation in waste reduction, more than half of residential waste is diverted from landfill.

Diversion facilities include the recycling facility, the composting facility and the waste-to-biofuels plant. In 2014, Edmonton achieved a 51% diversion rate for residential waste.

DIVERSION OF WASTE FROM THE LANDFILL

Percentage

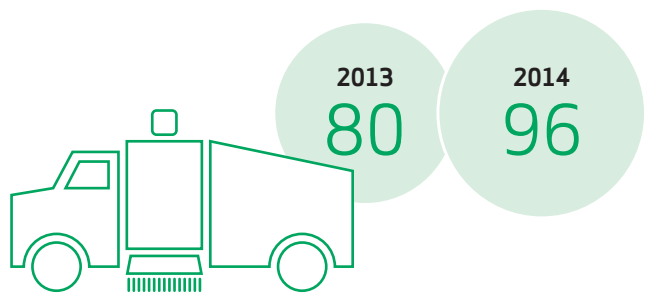


Road Sand Recycled per Year

Each year the City of Edmonton uses a tremendous amount of winter road traction material, including sand, salt and limestone chip, to ensure our roadways are safe. In 2014, the City of Edmonton has been able to recover and reuse around 96% of the sand collected in the Spring Sweep program.

ROAD SAND RECYCLED PER YEAR

Percentage



Going Bagless

Debbie C., a Master Composter Recycler, tried grasscycling for the first time this year. She'd already been using grass in her compost and as a garden mulch, but found she could only use a small volume of the clippings she produced.

"I always thought you needed to live in a warm and humid climate to grasscycle," she says, "so I jumped at the chance to find out if it could be successful in Edmonton's cooler, drier climate."

Debbie decided to experiment and grasscycled on only half of her lawn. That side appeared more lush, required less water and had fewer weeds popping up. She also noticed that she saved a lot of time by not having to change and empty the bag. And of course, she didn't have to drag it to the curb.

Will Debbie be going bagless again next year?

"Definitely," she says. She'll also be repeating her experiment and using the results to convince others to make the change as well.

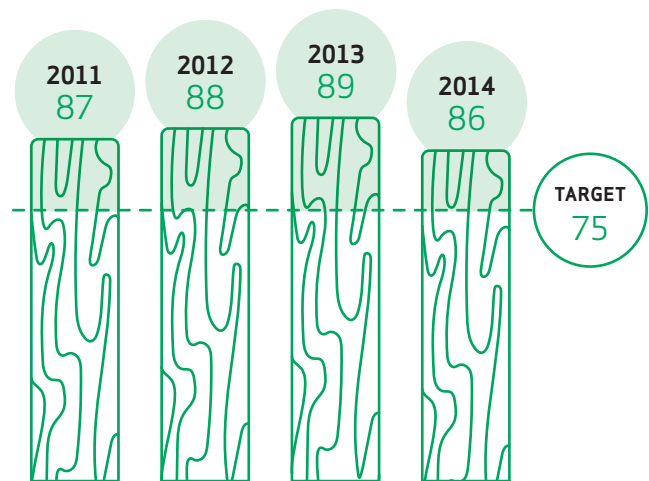


Construction Waste Recycled From LEED City Buildings

In 2014, the City exceeded its target of 75% of construction waste being recycled from City of Edmonton building projects that are striving for LEED certification. Construction Waste Recycled is calculated by dividing the tonnes of construction waste that is taken into recycling or reuse facilities by the total tonnes of construction waste produced during the construction of the City project. In 2014, the amount of construction waste recycled from all building projects totaled 79% while the construction waste recycled from LEED building projects reached 86%.

CONSTRUCTION WASTE RECYCLED FROM LEED CITY BUILDINGS

Percentage



SUSTAINABLE LIVING AND FOOD



THE WAY WE GREEN GOAL:

Lifestyles of Edmontonians contribute significantly to the city's sustainability and resilience.

THE WAY WE GREEN GOAL:

Edmonton has a resilient food and agriculture system that contributes to the local economy and the overall cultural, financial, social and environmental sustainability of the city.

The City is a Buzz

The City of Edmonton was busy pilot testing an urban beekeeping project in 2014. As a result of the 2014 pilot project, in April 2015, the Animal Licensing and Control Bylaw was officially changed to allow urban beekeeping within the City of Edmonton following a successful pilot. The pilot also gave insight into the types of questions citizens have about urban beekeeping, many of which hope to be answered in the campaign.

"Food and urban agriculture are the focuses of fresh and urban beekeeping is an important component of having a successful urban agriculture movement," says Hani Quan, Principal Planner with CITYlab. "Fresh is all about helping to create a resilient food and agriculture system that contributes to the local economy and the environmental sustainability of our city. Urban beekeeping ties in because it can help improve pollination for plants, which in turn helps to improve the overall biodiversity of our city" says Hani.

Learning About Local Food

Something different is growing in the schoolyard at Jasper Place High School (JPHS). Led by teacher, permaculture designer and master gardener Dustin Bajer, the JPHS permaculture program allows students to grow local food in an ecologically sound way.

This program focuses on hands-on learning. Students gain experience in aquaponics (growing fish and plants together in tanks), indoor herb propagation and managing a food forest.

The food produced by the permaculture program is used by the school's culinary arts program.



ECOLOGICAL FOOTPRINT

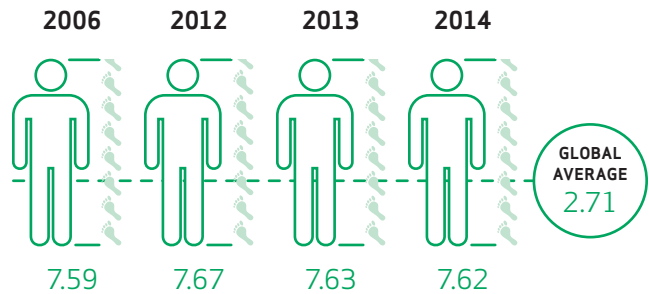
Ecological footprint is an indicator of the relative sustainability of a person's lifestyle. Edmontonians consume resources from outside our city boundaries, and the extraction, production and transportation of those resources have impacts both inside and outside our city boundaries.

In 2014, it is estimated the average Edmontonian's ecological footprint was 7.62 hectares per capita. This is almost three times larger than the average global footprint, and 4.5 times larger than the global biocapacity (what the Earth can regenerate and absorb each year). In 2014, the total footprint area for Edmonton's population of 877,926 would be 6,689,796 hectares.

In 2014, Edmonton's geographic area was 69,998 hectares, meaning we have enough area to produce or absorb approximately 1% of our ecological footprint within city boundaries.

AVERAGE ECOLOGICAL FOOTPRINT

Hectares per capita



WHAT IS SUSTAINABLE LIVING?

Sustainable living is a way of life where an individual uses physical, natural and social resources in a way that the resources are available or replaceable for others to use in perpetuity. One indicator of sustainable living is our ecological footprint. It has been estimated that the Earth has a global biocapacity (what the Earth can regenerate and absorb each year) of 1.7 global hectares per person. One indicator of sustainable living would be a footprint equal to or less than Earth's biocapacity of 1.7 global hectares per person.

The World Wildlife Fund reports on Earth Overshoot Day - the approximate date when we have used more natural resources than the planet is able to produce in a 12 month period. In 2014, Earth Overshoot Day was August 19, meaning that for the remaining 4 months of the year we were living on resources borrowed from future generations (i.e., not sustainable living).



Farmers Markets

Through *fresh: Edmonton's Food and Urban Agriculture Strategy*, the City of Edmonton has committed to strengthening farmers markets by supporting the development of new markets as well as sustaining existing markets. Farmers markets are incredibly valuable activities that simultaneously contribute to a number of key goals, including local economic development, healthier residents, vibrant and attractive places, social connectedness and greener cities. In 2014, there were 16 markets in Edmonton, a number that has grown steadily in recent years.

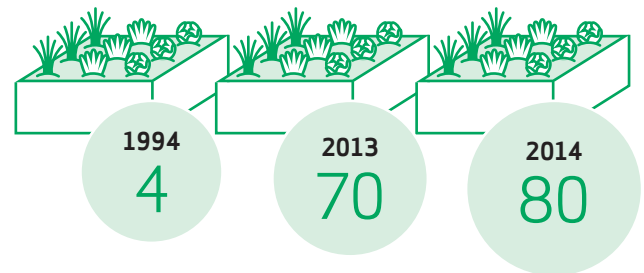
EDMONTON'S FARMERS MARKETS
Markets



Community Gardens

A community garden is a growing space that a group of people have come together to nurture, develop and sustain. The key feature of a community garden in the Edmonton area is that they are inclusive, meaning any member of the public may join the community garden. There are 80 community garden sites now operating throughout Edmonton promoting locally grown food, healthy and active lifestyles and safer, more socially connected communities. The environmental benefits of community gardens include a reduction in food miles, improved air quality, increased species habitat and storm water management.

EDMONTON'S COMMUNITY GARDENS
Gardens



A report printed on GARBAGE and
powered by RENEWABLE ENERGY?!?

This report is printed on paper made
from 100% post-consumer waste and
through the support of wind-powered technology,
reducing our carbon footprint.

*Join us in reducing Edmonton's footprint,
one step at a time.*

If you have any feedback or comments you would like to share,
please send them to thewaywegreen@edmonton.ca.

City of Edmonton, Sustainable Development
8th floor, HSBC Bank Place
10250 - 101 Street
Edmonton, AB T5J 3P4
Phone: 311 (in Edmonton) / 780-442-5311 (outside Edmonton)

edmonton.ca/Green Annual Report

The logo for the City of Edmonton, featuring the word "Edmonton" in a white, sans-serif font on a dark blue background.