

2015

EDMONTON'S REPORT ON THE ENVIRONMENT

supporting the way we green



Edmonton



edmonton.ca/GreenAnnualReport





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The purpose of Edmonton's Report on the Environment is to keep citizens informed about the larger state of the environment within the city boundaries and the City of Edmonton's corporate environmental performance. This report contributes to informed decision making amongst City administrators and citizens alike.

Check out the green measures on the Citizen Dashboard at
<https://dashboard.edmonton.ca/green>



MESSAGE

from Mayor
Don Iveson



Edmonton's Annual Report on the Environment showcases the progress being made towards the City's goal of becoming the nation's leader in setting and achieving the highest standards of environmental preservation and sustainability. This report contributes to informed decision making amongst City administrators and empowers citizens to take action to improve Edmonton's environment and reduce their own ecological footprint.

Many human activities have the potential to adversely impact the environment. Everything from industrial development to energy use to urban growth and transportation may adversely affect air, land, water and biodiversity. As such, the environmental impacts of these activities must be measured, evaluated and reported if they are to be effectively managed. Understanding the state 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.

This report keeps citizens and decision makers informed about the larger state of the environment within the city boundaries and the City's corporate environmental performance as it relates to environmental management.

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. We all have a part to play in continuing to improve our environment.



MESSAGE

from the City Manager

Our Annual Report on the Environment presents a good opportunity for us to reflect on the progress we have made towards our goals in The Way We Green, the City's environmental strategic plan.

In many areas we are making good progress. The community has made excellent progress in increasing the number of solar panels that are adding local electricity to the Edmonton area and more Edmontonians are purchasing electric and hybrid vehicles, which helps reduce our community greenhouse gas emissions. But we still have more work to do to improve air quality and move towards becoming a carbon neutral city.

As our city grows and takes on a denser urban form, it is important to keep track of how the environment is responding. Our environment provides us with the basics of life including air quality, water

purification, carbon storage and food. Environmental monitoring and data tracking can help us better protect the environment, and ultimately our health and well-being.

While it is sometimes difficult to track meaningful trends year to year, in 2015 we saw a number of environmental improvements: more hectares of priority natural areas were preserved, the Contaminant Reduction Index (which measures the volume of pollutants entering our river) improved, and there are more air quality monitoring stations in the Alberta Capital Airshed just to name a few. Environmental conservation and protection is a shared responsibility of the government and citizens, and by working together we can ensure a healthy environment for today and into the future.



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. The Way We Green's two main focuses are :

SUSTAINABILITY our society's ability to endure over a prolonged period as an integral part of Earth's natural systems

RESILIENCE the capacity of our city to withstand and bounce back intact from environmental disturbances

Reporting on The Way We Green is dynamic and adaptive. What the City of Edmonton currently reports on is not final or exhaustive in character; the report needs to be regularly refined as scientific knowledge improves, programs are developed, policies shift and data availability increases. Edmonton's Report on the Environment includes both community and City operations measures.

The City of Edmonton is committed to environmental sustainability and effective environmental management. To do this we need, and have, many tools. The Way We Green is the City of Edmonton's environmental strategic plan, outlining 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. 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 overarching strategy on the environment. Supporting the strategy are detailed initiatives and plans focused on specific environmental challenges that Edmonton faces, such as those listed on the next page.

+ ENERGY TRANSITION STRATEGY
+ 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...

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 Envisio, 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. 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.

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

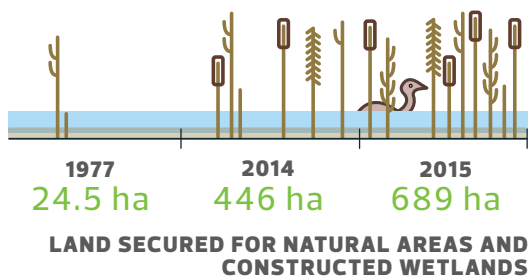


NATURE AND BIODIVERSITY

THE WAY WE GREEN GOAL

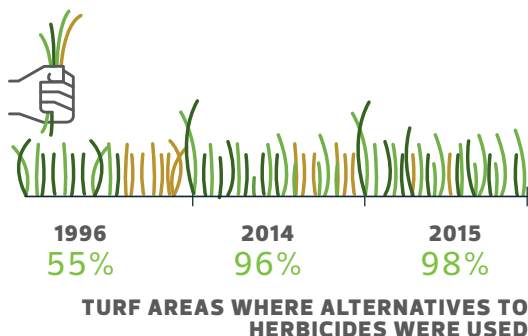
Edmonton's communities are full of nature – a place where in the course of everyday life residents experience a strong connection with nature.

LANDS SECURED FOR NATURAL AREAS AND CONSTRUCTED WETLANDS



Constructed wetlands are an integral component of Edmonton's stormwater 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.

HERBICIDE 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 used to control weeds.



TREE PEST MONITORING PROGRAM

Insect management programs have been protecting Edmonton's trees since the 1970's. Today's version is Edmonton's Tree Pest Monitoring Program. The program is comprehensive and has several components and specialized programs like the monitoring of invasive exotic species, native pests, elm bark beetles, and disease surveying.

As the pests in Edmonton have changed throughout the years, the program has also grown and developed. Significant environmental changes like the massive migration of the mountain pine beetle from British Columbia to Alberta in 2006 resulted in enhancements to the existing program. Mike Jenkins, a Biological Services Technician for the

City, speaks to the team discovering mountain pine beetles in the river valley this year, explaining "This is the first ever detection of mountain pine beetle within Edmonton. The overall numbers are still very low, but monitoring has been intensified and pheromones intended to move the beetles away from city trees will be deployed."

Pest monitoring programs are often the first, and most significant line of defense against pests like the mountain pine beetle. The example of the mountain pine beetle goes to show the vital role that programs like the Pest Monitoring Program play in protecting Edmonton's greenest asset.



NATURALIZATION RESEARCH PROJECT

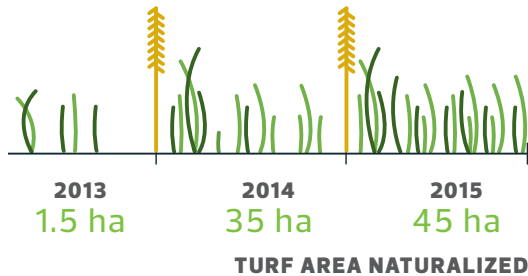
The Naturalization Research Project was a partnership from 2014 – 2016 between the Department of Renewable Resources at the University of Alberta and the City of Edmonton to study the effects of naturalization on living and non-living habitat.

Naturalization uses plant species that are native to a region to manage urban green spaces. This style of landscaping comes with many benefits including increased habitat for beneficial birds and insects, reducing maintenance time and costs for green spaces over the long term, as well as reducing stormwater runoff and soil erosion. Native plants also tend to become established and flourish sooner than their non-native counterparts.

The lack of research done around naturalization can make it difficult to get started and successfully manage these green spaces. This report provides valuable information to the City and other Edmontonians about naturalization, what practices are required to make the process successful and which native plant species will flourish in Edmonton. This research will become even more important as more naturalized spaces are created and maintained within our city. One area where the research results are already being applied is at Terwillegar Recreation Centre, where in summer 2016, recommended soil amendments from this research were used in an area where volunteers planted over 1600 native wildflowers during a special event – Planting for Pollinators.

To access results of this research, visit
www.edmonton.ca/naturalization

NATURALIZATION



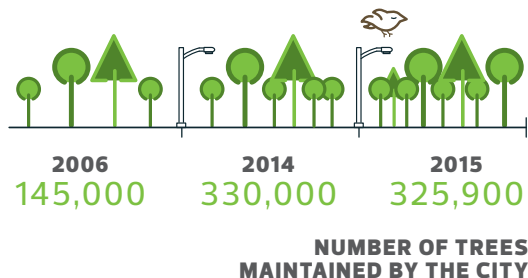
In 2015, the City continued the process of naturalization. Naturalization is a landscape management technique that allows the landscape to become more natural by planting trees, shrubs and wildflowers that are found naturally in Alberta.

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.

CITY-MAINTAINED TREES



The inventory of City-maintained trees continues to be kept up. 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.



ALBERTA WEED SPOTTER APP

The Weed Spotter App (the App) is a perfect example of utilizing technology to make something that is usually a massive undertaking into a community effort. Invasive plant species are an issue for any community and Edmonton is no exception. The App allows any person with an iOS device to identify and report noxious or invasive species of weeds regulated by the Alberta Weed Control Act. City staff use photos and a GPS location to follow up on any noxious or invasive weeds reported through the App. The City no longer has to be the only eyes on the ground, but instead has 8000 people who've downloaded the app so far and are helping out. The App was co-developed with the help of an Athabasca

University masters student, and with financial support from the City and the provincial government and has already proven a valuable tool to protect Alberta's gorgeous green spaces.

The App is user-friendly, walking users through plant identification and enables citizens to be involved in maintaining Edmonton's green space. The App already has one success story with the Common Barberry, found as an ornamental plant on the University of Alberta campus. When an App user reported the weed in the river valley, the City vegetation management team quickly removed it.

GOT STUMP?

Got Stump is an Edmonton based company offering services in stump and tree removal, tree pruning and trimming, and land clearing. As a local business, Got Stump is passionate about community investments and maintaining Edmonton's green natural green space.

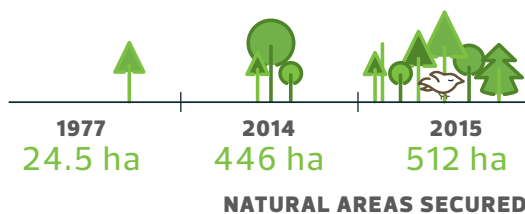
The organization has always been environmentally conscious in their operations. As a company Got Stump takes purposeful steps to green their operations like using organic materials whenever possible. Examples include biodegradable products for chainsaw bar oil and grapeseed oil as hydraulic fluid. They also work to reduce their driving distances and fuel consumption on a company-wide scale. To learn more about Got Stump and their sustainability initiatives visit <https://gotstump.ca>.

As a tree removal and stump grinding business Got Stump decided that a great way to give back to their community was to partner with the City initiative Root for Trees. The partnership has developed over a couple of years. For every stump over 16 inches wide that is ground and every tree removed Got Stump donates 10% to the Root for Trees program. Organizations like Got Stump are instrumental in helping Root for Trees meet their goals of planting an additional 16,000 trees in Edmonton each year.

For more information on how corporations can get involved with stewarding the urban forest please visit the Root for Trees Sponsorship page:

www.edmonton.ca/city_government/initiatives_innovation/sponsors-volunteers.aspx

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, 512 ha of tableland natural areas have been secured. In addition, 2,467 ha of river valley natural areas have been secured.

NATURE AND BIODIVERSITY “DID YOU KNOW”?

69,000 of the trees maintained by the City are elm trees, making this the largest population of Dutch Elm Disease free elms in the world!



WATER

THE WAY WE GREEN GOAL

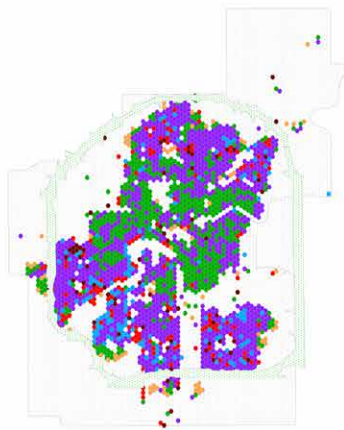
Water quality in the North Saskatchewan River sustains healthy people and healthy ecosystems. Edmonton's water supply meets its needs.

ALBERTA RIVER WATER QUALITY INDEX

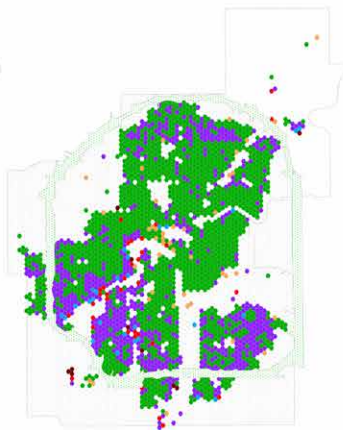


The Alberta River Water Quality Index was developed as a way to summarize physical, chemical and biological data into a simple descriptor of water quality. The index provides a simple snapshot of annual water quality conditions in major rivers of the province, such as the North Saskatchewan River. The 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. Index ratings for the North Saskatchewan River for the past three years have been somewhat lower than

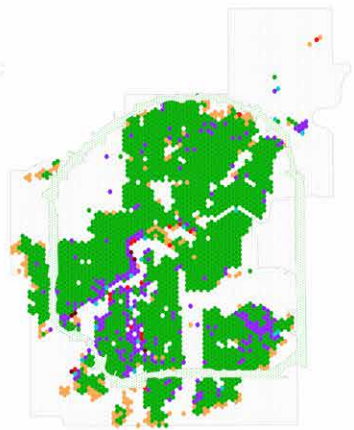
they have been in recent history. This was due to the fact that in these years, sampling coincided with large precipitation and runoff events, which resulted in exceedances in nutrient and bacteria guidelines. In 2013/14, however, the monitoring site upstream of Edmonton rated excellent with only a few exceedances of nutrient guidelines. Downstream at the monitoring site, July sampling coincided with a rainfall event. This combined with the additional bacteria guideline exceedances and pesticide detections, resulted in a rating of 'Fair' at the site.



2002 Average
Residential Consumption



2009 Average
Residential Consumption



2015 Average Residential
Consumption

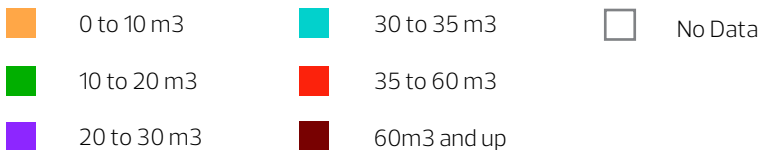
EPCOR HEXAGON MAPPING PROGRAM

As one of Alberta's largest utility providers, EPCOR is a significant source of water use information within Edmonton. The organization has used historical residential water consumption data to create its hexagon mapping initiative. Hexagon mapping provides a visual representation of water usage trends by area. EPCOR averages the water demand of Edmonton customers within a hexagonal area that is approximately two by two city blocks. The data is then mapped and used to compare water usage within Edmonton. The detailed information regarding

residential water usage trends allows stakeholders to understand who is using water, where, when and how much.

Water usage in Edmonton has historically been lower than the national average due to our relatively short summers and continues to decrease due to the continued installation of high-efficiency fixtures and appliances. The hexagon mapping initiative monitors this trend and supports purposeful water conservation outreach, contributing to goals in The Way We Green.

MONTHLY AVERAGE CONSUMPTION PER HEXAGON



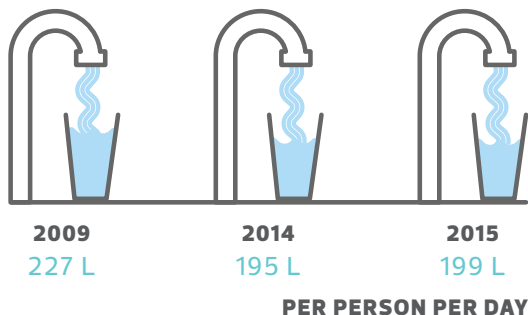
IVOR DENT PARK

As a 138 acre site that is home to 24 sports fields, you can imagine the undertaking that maintaining the Ivor Dent Sports Park is on a day to day basis. To take advantage of a natural water supply and to reduce reliance on the City's potable water supply Ivor Dent Sports Park has created a uniquely sustainable irrigation system, the first stormwater reuse system of its kind within City of Edmonton operations. The closed system features four stormwater management facilities inside the park that

collect then reuse rainwater to irrigate the grounds. These facilities manage stormwater, both for water quantity and water quality, to ensure proper and safe surface irrigation.

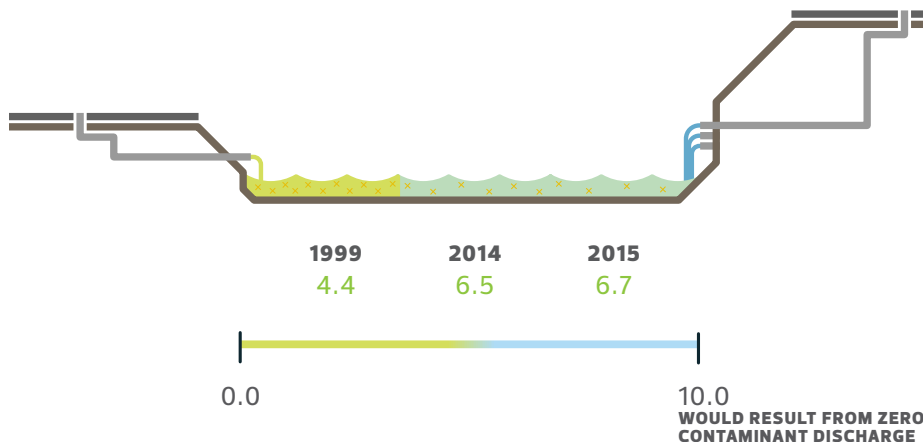
The Ivor Dent Sports Park stormwater reuse system is truly a leader in sustainability as it sets an example for other City of Edmonton facilities that are looking at similar irrigation systems. This type of water conservation also contributes to goals identified in The Way We Green.

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 a well established metering program, public education, rate setting methods, and relatively short summers. Water use per person continues to stay relatively low due to the continued installation of high efficiency toilets and clothes washers.

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 into 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.



AIR QUALITY

THE WAY WE GREEN GOAL

Edmonton's air sustains healthy people
and healthy ecosystems.



CLEAN AIR DAY MOSS BENCH INSTALLATION

Environment Week in Edmonton is a whirlwind of activities celebrating a sustainable Edmonton and Environment Week 2015 was no different. A major event on the Environment Week calendar is Clean Air Day, an annual event that falls on the Wednesday of Environment Week. On June 3rd, Mayor Don Iveson officially proclaimed Clean Air Day in Edmonton. The proclamation was made in front of City Hall to a crowd of citizens and City Hall School students who enthusiastically chanted "We care about clean air!"

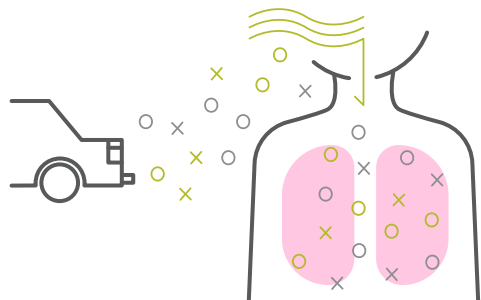
The other star of Environment Week was 'green art' designed to celebrate clean air. Three public art installations were created to raise awareness of Clean Air Day and to contribute to improving Edmonton's air quality. The public art consisted of a moss bench and two moss bicycles placed around

downtown as visual reminders of Edmonton's commitment to clean air and the steps Edmontonians can take to support air quality. The public art was also practical since moss is a plant with the ability to absorb air pollution and improve air quality.

"The City is very committed to improving Edmonton's air quality and we are actively working with our regional partners to develop innovative programs to do so," said Mayor Don Iveson. "These art installations are an original way to engage Edmontonians and illustrate practical things people can do to help improve our air quality." The installations were a huge hit with the public.

CANADIAN AMBIENT AIR QUALITY STANDARDS

PM2.5 MANAGEMENT RESPONSE LEVELS



MANAGEMENT LEVEL	RED	ORANGE	YELLOW	GREEN
PM2.5 ANNUAL CONCENTRATION THRESHOLD (MICROGRAMS/CUBIC METER)	10.0	6.4	4.0	N/A
PM2.5 24 HOURS CONCENTRATION (MICROGRAMS/CUBIC METER)	28	19	10	N/A

RED
Actions to reduce concentrations
to the threshold level

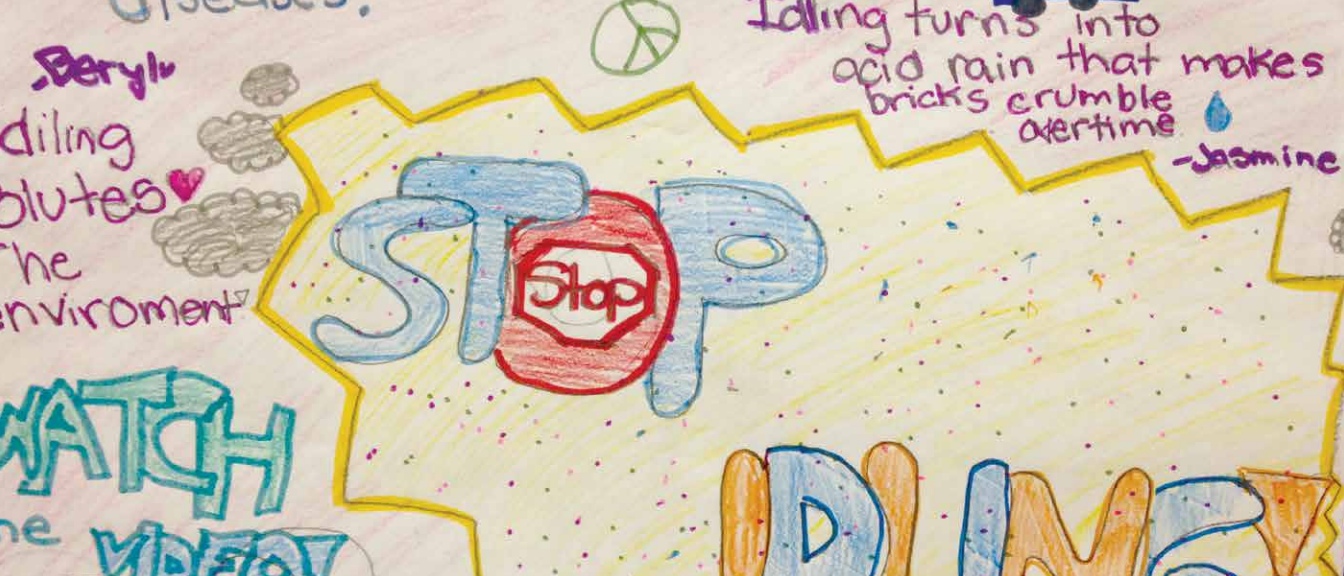
ORANGE
Actions to prevent CAAQS exceedance

YELLOW
Actions to prevent air quality deterioration

GREEN
Actions to keeping clean areas clean

Many sources and factors impact Edmonton's air quality. 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 (PM2.5) – 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, and implementation of

the response plan is ongoing. The City of Edmonton is working on 26 actions in that plan, such as the expansion of the LRT network. In 2015 the federal government replaced the standards for PM2.5 and Ozone with the new, more stringent Canadian Air Quality Standards. The new standards have lowered short-term limits and introduced long-term exposure limits to further protect both our health and our environment. In 2015 the three monitoring stations used to evaluate these trends were all in the "orange" level".



CLEAN AIR RESPONSIBLE SCHOOLS

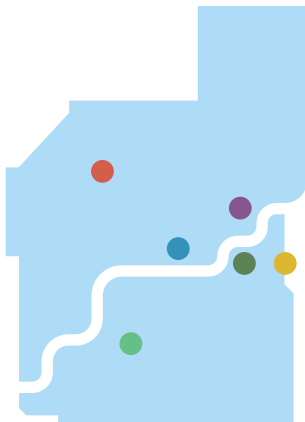
Students truly are our future. Educating children about environmental sustainability is vital for advancing their role as environmental stewards and engaged citizens.

Clean Air Responsible Schools, also known as CARS, is a program that educates elementary school children in Alberta about air quality, greenhouse gas emissions and climate change. Presented by Inside Education and the Alberta Capital Airshed, CARS educates elementary school children about air quality and excites them about taking action in their schools and communities. This year's pilot program worked with 25 classrooms of Grade 5 students in

Edmonton and Calgary schools. The students were educated about the link between vehicle idling and air quality and then challenged to create a campaign to educate their parents, other students, bus drivers and other stakeholders about how responsible vehicle idling can help air quality around their schools. The students learned, researched by taking air quality samples and contributed to their communities through environmental activism.

The hands-on, student-led and citizen science based program received rave reviews from students and teachers alike.

YEARS AIR QUALITY MONITORING STATIONS WERE PLACED



2015 **ARDROSSAN**

2010 **WOODCROFT**

2005 **EDMONTON SOUTH**

1979 **BEVERLY**

1979 **GOLDBAR**

1976 **EDMONTON CENTRAL**

1972 **EDMONTON EAST**

Edmonton's ambient air quality monitoring network is operated by the provincial government and various industrial operators. In 2015 the Alberta Capital Airshed added another stationary air quality monitor to its network in Ardrossan, Strathcona County. This brings the total monitoring stations in

the region's network to seven. The stations monitor various pollutants such as: Carbon Monoxide, Particulate Matter, Nitrogen Oxides, Ground Level Ozone, Sulphur Dioxide, Hydrogen Sulphide, Methane and Total Hydrocarbons, depending on the station.

AIR QUALITY "DID YOU KNOW"?

The Air Quality Health Index (AQHI) is an information tool for the public that relates air quality to people's health on a simple 1 to 10 scale. The risk categories and numbers imply a continuum of health risk due to outdoor air pollution. The higher the number, the greater the risk and your need to take precautions.

For more information visit

www.aep.alberta.ca/air/air-quality-health-index/default.aspx



ENERGY AND CLIMATE CHANGE

THE WAY WE GREEN GOAL

Edmonton's sources and uses of energy are sustainable.

Edmonton is a carbon-neutral city.

Edmonton is resilient to disturbances from climate change.

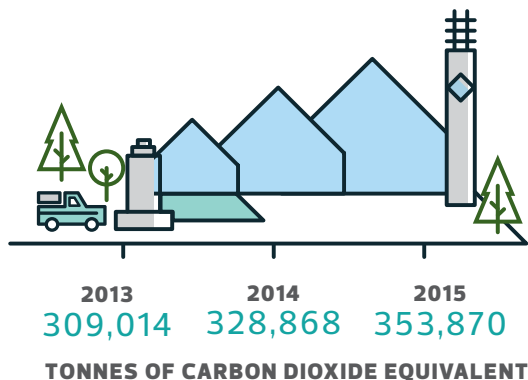
ECOCITY EDMONTON AT HILLVIEW SCHOOL

EcoCity Edmonton is a grant program designed to support community sustainability projects within our city. This year Hillview School partnered with NAIT's Alternative Energy Program to take advantage of the EcoCity Edmonton grant to pilot a solar panel and environmental education project in the school. Staff and students from NAIT designed a solar photovoltaic (PV) array that they then installed on the roof of Hillview School. The solar system captures solar energy that is used to power the school. Twelve solar modules were installed and are capable

of producing up to 60% of the power an average homeowner uses in a year.

This collaboration between NAIT Alternative Energy Program and Hillview School is an excellent use of the EcoCity grant as it was designed to inspire community organizations to get environmental programs off the ground. This project provides Hillview School with an alternative source of energy, reduces their greenhouse gas emissions while also educating their students about renewable energy solutions.

CITY OPERATIONS GREENHOUSE GAS EMISSIONS



The amount of greenhouse gases that are produced as a result of City of Edmonton operations from every department show the City's relative contribution in Edmonton's overall carbon footprint. This includes emissions generated from the use of vehicle fuels, city owned landfills, natural gas and electricity. 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 2013, when renewable energy certificate purchasing began. City operations produced approximately 2% of total community greenhouse gas emissions in 2015.

ENERGY USED PER PERSON IN EDMONTON



2008
57,334



2014
57,318



2015
52,331

KILOWATT HOURS

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. Energy used per person in Edmonton decreased in 2015. The main areas of decrease was natural gas for heating homes (possibly due to the warm winter) and a reduction in diesel fuel sold in Edmonton.

ALTERNATIVE ENERGY SITES



2014
215

2015
276

SITES

Micro-generation sites are sites that generate less than 1 megawatt (MW) of electricity, and produce this electricity using renewable energy sources. This can include solar panels, wind, biomass, or fuel cells. Micro-generation sites can also be an indicator of the increasing diversity of our energy system, contributing to the goals in Edmonton's Community Energy Transition Policy.



QUEEN ELIZABETH OUTDOOR POOL SOLAR PANEL PROJECT

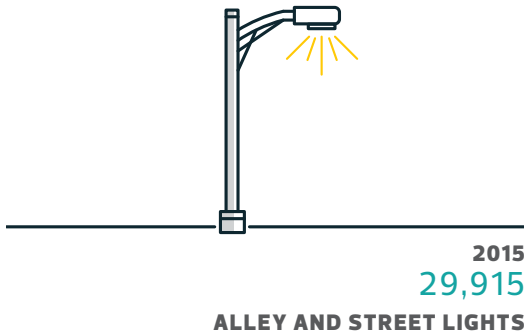
Edmonton has one of the highest rates of solar potential in Canada; therefore, more and more businesses and homes are taking advantage of solar power as a renewable resource. Solar PV systems are an excellent investment to reduce reliance on traditional energy sources while saving energy costs and reducing greenhouse gas emissions.

With that knowledge in mind the team at the Queen Elizabeth Outdoor Pool saw an opportunity to take a step towards sustainability. This year 200 solar panels were installed on the roof of the Queen Elizabeth Outdoor Building. The panels generate about 50,000 kilowatt-hours of electricity each

year, which is about 40% of the energy that the pool uses annually. A separate set of solar panels was installed to heat the water in the pool. These solar PV systems avoid, on average, 34 tons of greenhouse gas emissions per year!

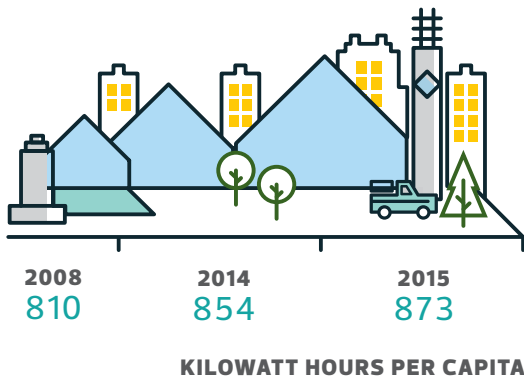
By taking advantage of Edmonton's solar potential, the Queen Elizabeth Outdoor Pool is setting an example for all City of Edmonton operations and beyond. The data collected from the solar PV system throughout the year will provide the City valuable insight regarding the installation and maintenance of solar PV systems on other City buildings in the future.

LED STREET LIGHTING



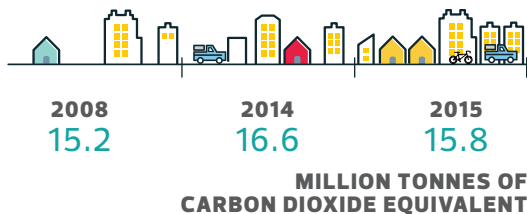
Light-emitting diodes (LEDs) light bulbs are more energy efficient than other types of light bulbs, designed to have a longer lifespan, lower maintenance costs, and recognized energy savings. Conversion from the conventional street lighting to LED technology will result in power consumption reductions, contributing to the goals identified in Edmonton's Community Energy Transition Strategy.

TOTAL ANNUAL ENERGY USED IN CITY OPERATIONS PER CAPITA



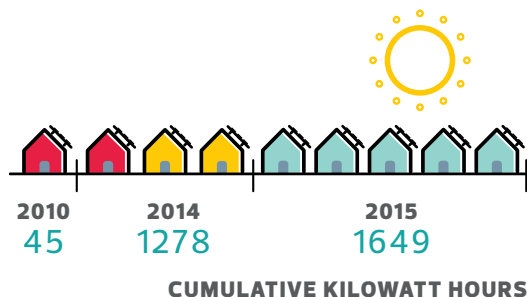
The total amount of energy used by the City of Edmonton operations provides information on the relative contribution of City operations to the overall energy footprint of our community. This includes vehicle fuels (gasoline, diesel, propane, natural gas), natural gas heating for buildings, electricity use for buildings, street lighting and transportation. This value does not include the fuel consumption for anything related to transit vehicles, transit buildings, or police vehicles. Energy use in City operations has increased in response to the exceptional growth the city has seen in recent years.

COMMUNITY GREENHOUSE GAS EMISSIONS



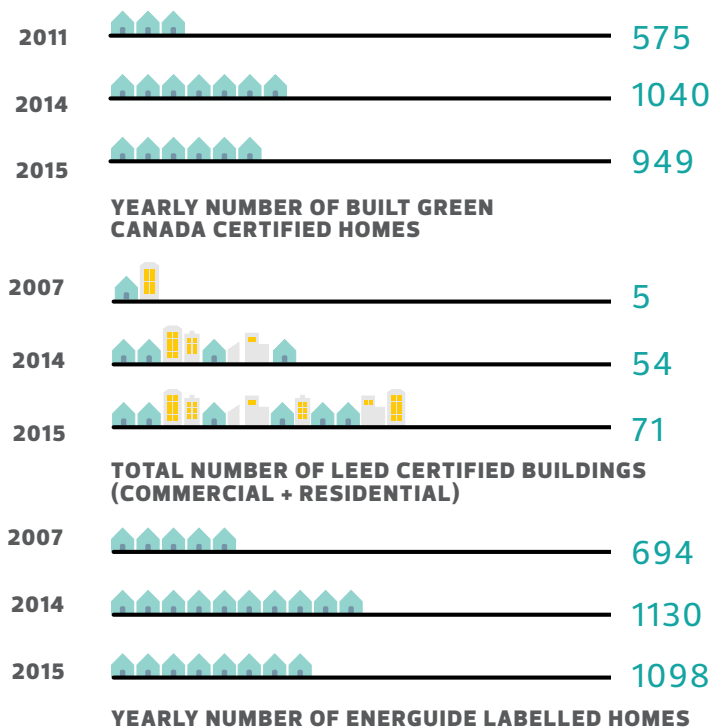
The City monitors greenhouse gas trends to know Edmonton's relative contribution to climate change. Climate change is currently largely being driven by human emissions of CO₂ and other gases that contribute to the atmospheric greenhouse effect. The total amount of greenhouse gas emissions is derived 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.

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 Edmonton's Community Energy Transition Policy. It can also be an indicator of the increasing diversity of our energy system. As solar PV becomes more affordable, installations are increasing at an accelerated rate.

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 measurable sustainability improvements in the residential and commercial markets.



LAND MANAGEMENT AND TRANSPORTATION

THE WAY WE GREEN GOAL

Edmonton is a carbon-neutral city

WALKING, BIKING AND ACCESSIBILITY INFRASTRUCTURE

	ON STREET BIKE ROUTES	SHARED USE PATHS	SIDE WALKS	CURB RAMPS	BUS STOPS
					
2013	19.3 KM	1.4 KM	/	/	/
2014	8.0 KM	1.0 KM	/	/	/
2015	3.6 KM	0.5 KM	1.8 KM	124	40

The City is looking at new kinds of bike lanes for Edmonton's future. Quality cycling infrastructure that connects people to the places they want to go encourages cycling as a safe and healthy alternative for traveling around the city. The City has heard from the public that they would like to see more protected bike lanes in Edmonton. And that's exactly the type

of cycling infrastructure the City is exploring in core areas of the city like on 102 Avenue and 83 Avenue. Thirty-one percent of the trips Edmontonians make in their vehicles could be travelled by bike in 13 minutes or less. The goal is to make these trips easier and more comfortable.



WHAT THE B*KE ENGAGEMENT PROGRAM

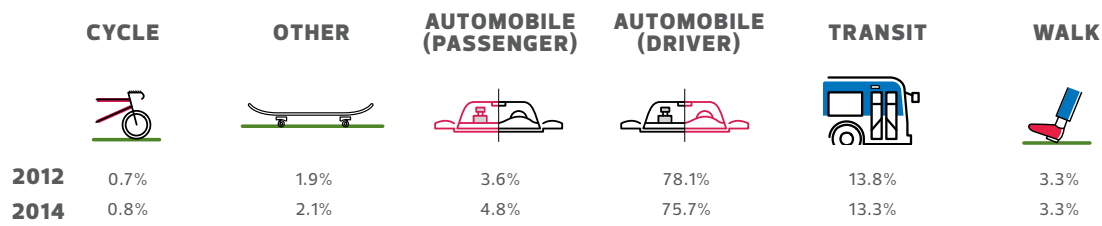
what the b*ke?!

Where are cyclists found in the City of Edmonton? In the near future 102nd Avenue downtown and 83rd Avenue on the south side will be major hubs of cycle transportation. What the B*ke was a campaign designed to restart the conversation about bike lanes in Edmonton, considering the good and the bad to take real steps toward improving cycling infrastructure in Edmonton.

What the B*ke answered the age-old questions of why cycle and what's the purpose of cycling infrastructure? The campaign also invited public opinion

on the development of 102nd and 83rd Avenues as major cycling routes. As Edmonton grows and develops, it is important to move citizens more efficiently throughout the City. Creating well designed and executed cycling infrastructure that is approved by Edmontonians goes a long way to ensuring the paths will be used for years to come.

TRANSPORTATION MODE SPLIT



NOTE

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

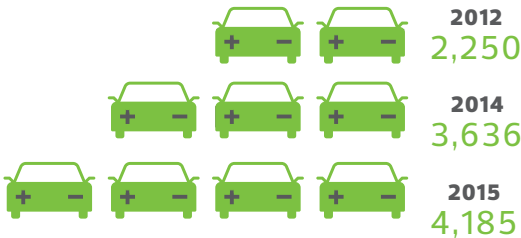
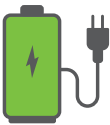
all residents aged 12 or older. For comparability purposes, the 2014 data shown here includes only those residents who identified as "Employed" (full time or part time).

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 favourably in this measure. Prior to 2012, the data on the commute to work was updated every five years using the Federal Census and National Household Survey. Data is now available every two years through the Edmonton Municipal Census allowing for a greater ability to track trends.

Mobility shift from single passenger vehicles to public transit, cycling, and walking can contribute to reductions in greenhouse gases and conservation of non-renewable resources. Over the years, increased environmental awareness and an expanding transit network has lead to an increased availability of more sustainable and active modes of transportation. In the next several years, Edmonton will continue to see significant infrastructure investments, providing citizens with more travel options in support of a change in the mode split.

EV CHARGING STATIONS/ ELECTRIC AND HYBRID VEHICLES REGISTERED IN EDMONTON

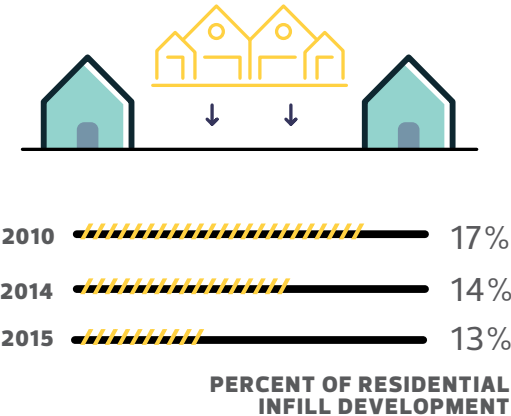
2015
8
**PUBLIC CHARGING
STATION LOCATIONS
IN CITY LIMITS**



**ELECTRIC AND HYBRID VEHICLES
REGISTERED IN EDMONTON**

Electric vehicles are typically healthier for the environment than traditional combustion engine vehicles. Because electric vehicles use an electric motor instead of burning fossil fuels, they improve local air quality, reduce greenhouse gas emissions, and save the operator money on fuel. However, sometimes emissions generated from production of batteries for electric vehicles can be greater than emissions generated for production of gas vehicles, but these differences do tend to be cancelled out as the vehicle is run. In addition, with a carbon-intensive electricity grid, there can be debate on how much cleaner electric vehicles are than gas vehicles "cradle to grave". That being said, it should be noted that technology is continually improving these points.

INFILL



Residential infill is the development of new housing in established neighborhoods. 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 development use land and resources efficiently, which accommodates growth and change with a lower environmental impact.

Edmonton set a target in The Way We Grow to have 25% of new residential development be infill. This 25% target is not representative of the entire infill program, as not all established neighborhoods are included in this target. 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. In particular, Evolving Infill is focused on neighborhoods significantly developed before 1995.

LAND MANAGEMENT AND TRANSPORTATION “DID YOU KNOW”?

In 2015, over 430,000 pedestrians and 370,000 cyclists used the High Level Bridge. This amounts to an average annual daily volume of 2,200 pedestrians and cyclists. By comparison, approximately 22,000 vehicles use the bridge every week day.

MAIN STREETS

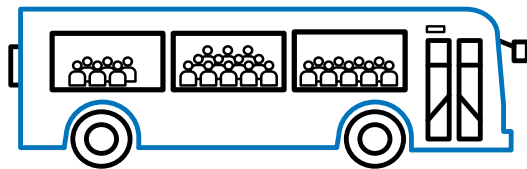
Did you hang out on main street when you were a kid? The concept of a shared community space where people walk, shop and spend time seems like a throwback to a generation past, but the City of Edmonton is working to connect the tradition of Main Streets with the sustainable future of our City. Main Streets are almost universally recognized as the core of a community's cultural, social and economic life. This project creates significant places for people and transportation.

Main Streets are pedestrian priority streets designed to attract citizens and improve the

typical experience walking down Edmonton's streets. These streets will buffer pedestrians from traffic and widen existing sidewalks creating an urban space that can be enjoyed by all. The streets also contain elements of a beautification project with street furniture, landscaping and inviting store-fronts utilized to beautify the neighborhood.

A brand new guideline designed in 2015 will be the main reference point used when creating Main Streets. Creating shared and usable spaces for pedestrians, cyclists, and transit users moves Edmonton toward a more sustainable future.

TRANSIT RIDERSHIP



2005
76

2014
102

2015
99

TRANSIT RIDERSHIP PER CAPITA

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 per capita means that more people are taking transit and implies that a greater proportion of daily trips are being made by transit.

The decreases over the past two years may be linked to two main factors:

- 1) Population growth has increased at a faster rate than the growth in transit services hours, particularly in the outer areas of the city where there is limited introduction of new services; and
- 2) Unfavorable economic conditions and increased levels of unemployment.

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.

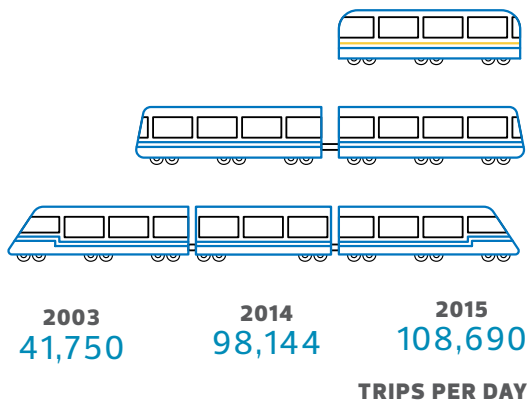
The City launched a Brownfield Redevelopment Grant in 2011 to provide assistance to property owners, interested groups and developers intent on improving the use of former refueling site brownfields. Response to the program has continued with more than 25 brownfield redevelopment projects completed or in progress through the support of the program since 2011. In 2015 the program was the recipient of the Canadian Urban Institute's Brownie Award, the Minister's Award for Municipal Excellence and the FCM Sustainable Communities Award.

The grant funding is 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. A Phase IV grant is available to assist with interim uses (park, solar installation, other) for sites that will be in long term remediation. 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. 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.

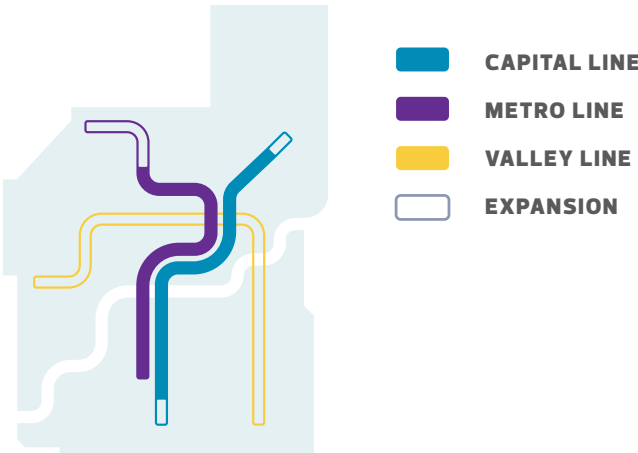
Some of the brownfield redevelopment projects include, 4 multi-story, mixed-use facility including below-market housing; a two tower condominium complex in the downtown area; rental accommodation and a healing garden. The total value of the grants linked to various redevelopment projects completed or underway is just over \$8,000,000. The value to the communities of the redevelopment is far greater than the investment.

LRT RIDERSHIP



The City aims to continue its expansion of the LRT network. One of these expansions includes the Southeast to West LRT (Valley Line), that will be a low-floor urban line that will run from Millwoods to Lewis Farms, crossing through downtown. The future line runs a total length of 27 km and its route has been approved by City Council. Public input helped shape the route, stop/station locations and other details during the Concept Planning phase. City Council has approved a funding strategy for the Valley Line, starting with the \$1.8 billion Millwoods to Center West leg.

In 2015 the Metro Line, extending from Century Park to NAIT, was opened and contributed to an increase in LRT ridership.





WASTE

THE WAY WE GREEN GOAL

Edmonton generates zero waste

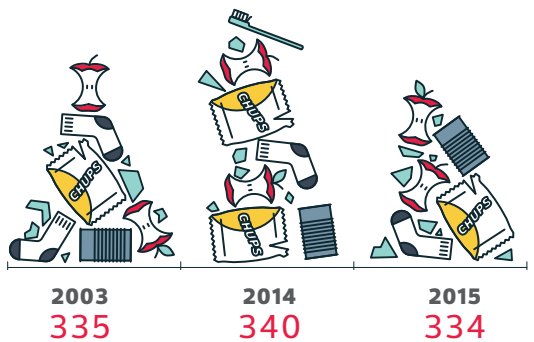
DIVERTED FROM LANDFILL



DIVERTED WASTE FROM LANDFILL

Residential Waste Diversion measures the percentage of residential waste kept out of the 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 the landfill. Diversion facilities include the recycling facility, the composting facility and the waste-to-biofuels plant.

WASTE PRODUCED PER PERSON



KILOGRAMS PER PERSON PER YEAR

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.



U OF A'S ECO MOVE OUT SPRING CLEAN UP

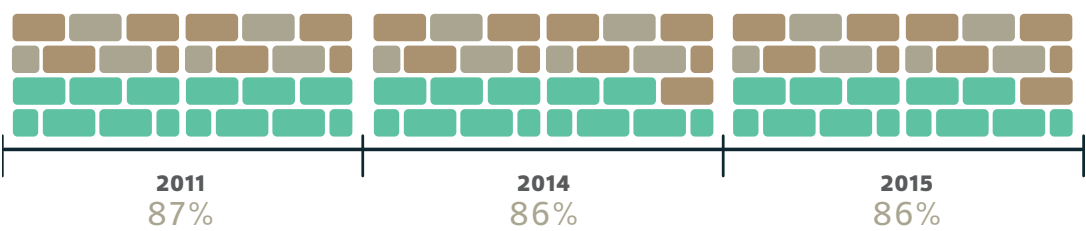
Prior to 2011, each residence at the U of A coordinated their student move out process independently. Eco Move Out, led by the Office of Sustainability, was the first coordinated effort to reduce, reuse and recycle materials students have leftover from their year of living in residence. This program has been instrumental in bringing the U of A campus together to reduce the environmental impact of move out day.

Eco Move Out is a significant undertaking each year with more and more waste diverted to organizations that can reuse or recycle the materials. They take in everything you could find in a dorm room including clothing & household items, electronics, non-perishable food, toiletry items, frozen food, furniture & appliances, organic material and mattresses. The majority of items collected are recycled or reused

with the program continually seeking ways to improve their waste diversion rate.

The Office of Sustainability works closely with Residence Services to communicate with students about Eco Move Out including drop-off times, locations and what items can be reused or recycled. Many organizations benefit from partnering with the program each year including Goodwill Industries of Alberta, the Campus Food Bank, the Mustard Seed & YESS. Over their four years in operation Eco Move Out has diverted over 43,000 KG of waste from local landfills and plans to continue doing so for years to come!

CONSTRUCTION WASTE RECYCLED FROM LEED BUILDINGS



CONSTRUCTION WASTE RECYCLED



RECYCLED CONSTRUCTION WASTE



REGULAR CONSTRUCTION MATERIAL

Conserving resources during construction and throughout the operation of a building is key to building green. Green buildings protect and restore biodiversity while improving the economy by promoting renewable energy technology. Since January 2008, all new City-owned buildings and major renovations have been designed and constructed to meet Leadership in Energy and Environmental Design (LEED) Silver Standard as a minimum, and to be formally LEED Certified.

In 2015, 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 2015, the amount of construction waste recycled from all building projects totaled 79% while the construction waste recycled from LEED buildings reached 86%.



THE AMAZING RACE

When CTV's The Amazing Race Canada brought contestants to Edmonton in May of 2015, the producers wanted to showcase the best and brightest Edmonton had to offer.

Perhaps the most notable stop of the day was at the Edmonton Waste Management Centre (EWMC). As a collection of advanced waste processing and research facilities, the EWMC is a unique place where waste is transformed into useful resources. CTV producers worked with staff members at the EWMC to create challenges that would leave the four remaining teams as tired, sweaty and uncomfortable as possible. Considering all of the different processes happening throughout the EWMC, finding a challenge for The Amazing Race Canada contestants was an easy feat.

The contestants competed on the sorting lines at the Materials Recovery Facility and at the e-waste recycling facility. After a quick safety and training session, they sorted the fast-moving recyclables into various bins and extracted the monitors from computers for recycling. Critical processes at the Edmonton Waste Management Centre include composting, sorting recyclables, processing electronic waste, recycling construction waste, and more. The Landfill Gas Recovery System produces 4.8 megawatts of electricity annually through the conversion of landfill gas. The EWMC is also home to the largest aerobic co-composting facility in North America, which turns organic wastes into compost.

The processes at the Edmonton Waste Management Centre are integral to Edmonton's sustainability goals, keeping waste out of landfill and reducing Greenhouse Gas emissions.



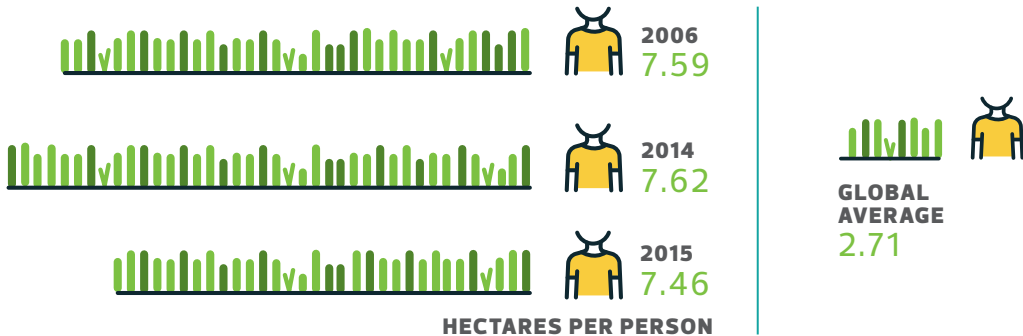
SUSTAINABILITY AND FOOD

THE WAY WE GREEN GOAL

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

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.

ECOLOGICAL FOOTPRINT



Ecological Footprint measures the resources Edmontonians consume and the waste they produce, compared to Earth's ability to provide these resources and absorb the waste. This measure is calculated by considering all of the biological materials consumed and all of the biological waste generated nationally per person, utilizing the Global Footprint Network's calculation methods.

The measure is representative of the relative sustainability of Edmontonians' lifestyles. Edmontonians consume resources from outside the city boundaries, but the extraction, production and transportation of those resources have impacts both inside and outside the city boundaries.

The ecological footprint measure puts a number on some of the environmental impacts of Edmontonians' consumption. It demonstrates whether Edmontonians are living within their ecological means, noting that living beyond their means will affect their long-term quality of life.

Edmonton's ecological footprint in 2015 was 7.45 hectares per capita. The decrease from 2014 results

can be attributed to a decrease in direct energy consumption (energy associated with shelter and transportation).

Overall, Edmonton's ecological footprint has remained relatively constant. Edmonton's ecological footprint can be compared with national and global footprint averages, as well as the global biocapacity of Earth (what Earth can regenerate and absorb each year).

One indicator of sustainability would be reflected by a global footprint equal to or less than Earth's global biocapacity of 1.7 global hectares per person. Edmonton's ecological footprint is almost three times larger than the global average and 4.5 times larger than the global biocapacity. The main drivers of Edmonton's high ecological footprint are Edmontonians' average consumption practices (which are related to wealth) and the use of fossil fuels (55 per cent of Canada's ecological footprint is related to carbon). This measure is impacted by how environmentally sustainable Edmontonians' lifestyles and choices are.



RIVER CITY CHICKEN COLLECTIVE

If you pay attention to changes in Edmonton you probably heard the 'clucking' around the City's new pilot project involving some egg-celent feathered friends. The Urban Hens Pilot Project was approved in 2015 with 19 licenses given to interested hen keepers. This was made possible in part due to efforts of the River City Chickens Collective, a citizen group that strongly advocated for urban hens, and worked collaboratively with the City of Edmonton to inform the city to allow a pilot project and opening the gate for urban hens.

Urban hen keeping isn't a new thing. In many places around the globe, it is common to see hens being kept in cities. However, Canadian cities have only recently began to embrace this trend. In Edmonton, hen keeping is also well supported by fresh: Edmonton's Food and Urban Agriculture Strategy. A list of other Canadian cities, including Red Deer, Victoria, Vancouver, Niagara Falls, and Brampton

have already allowed citizens to keep hens, and Edmonton is following in their footsteps to include hens in the urban landscape.

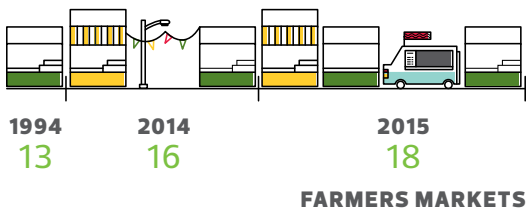
The pilot project demonstrated its success with hen keepers enjoying fresh eggs, taking a step towards increasing food resiliency as well as education in self-sustainability. The pilot was so well received that the decision was made in the spring of 2016 to expand the pilot, extending it for another year, and increasing the number of available licenses in the city from 19 to 50. Calm and friendly with gregarious personalities, hens can also make great pets for the right owners. However, keeping any animal requires careful consideration and research. The River City Chickens Collective has been an important local source of expertise, education, and support for aspiring hen keepers offering advice on breeds, housing and keeping hens happy and healthy.

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 82 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 stormwater management.

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 2015, there were 18 markets operating in Edmonton, a number that has grown steadily in recent years.

HOME\$AVERS EVENT

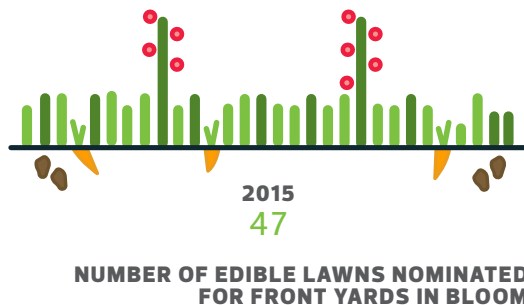
The Home\$avers Event presented by The City in partnership with EPCOR and RONA is Edmonton's biggest annual energy saving sales event. Products designed to promote a sustainable lifestyle are deeply discounted. For some products, the Home\$avers event is the only time that they go on sale.

Edmontonians line up at RONA's South and North locations hours before the 7 am opening time to secure their eco-friendly products. The sale's favorite items included the smart thermostats, EPCOR sponsored rain barrels, LED light bulbs, low flow shower heads and more. Every year the sale attracts more interested citizens with 2015 being the most popular event yet. These energy-efficient

products have a noticeable effect on household energy use levels, but the combined impact of all of these energy efficient products has the most significant impact. The majority of the 3,232 energy-efficient sale products were purchased the day of the sale. If all of these products are utilized, potential savings include \$42,636.24 in utility costs and avoid the release of 363.10 tons of CO₂ emissions throughout the year. That's the equivalent of planting 36,310 trees!

The Home\$aver Event goes to show that every small step toward a sustainable future makes a big difference!

EDIBLE LAWNS



An edible front yard is a yard that incorporates edible fruit, flowers and leaves into its design. This can include everything from vegetables and grains to fruit bearing trees, berry bushes, and even mushrooms. Edible front yards contribute to biodiversity and help pollinators, while also contributing to our urban agriculture and sustainable food. Why mow it when you could eat it?



URBAN BEEKEEPING

YEG Bees is a group of local beekeepers who have been involved in Edmonton's urban beekeeping scene since its inception. The group promotes urban beekeeping in Edmonton through education and outreach with interested community members. Anyone looking into an urban hive within Edmonton can start with advice from YEG Bees and their experienced members.

Urban beekeeping is a concept that intrigues many people, but the fact that it's not very common in Canada leads to a lot of questions from interested citizens. Groups like YEG Bees demonstrate the importance special interest groups play in kick-starting sustainability initiatives. In recognition of the potential value of urban beekeeping, in April 2015 City Council passed an amendment to the Animal Licensing and Control Bylaw to permit beekeeping in the city, and this was in large part due to the work from YEG Bees and involved community members.

Bees play a major role in pollinating flowering plants and are the major type of pollinator in many ecosystems that contain flowering plants. Estimates report that one-third of the human food supply depends on pollination by insects, birds, and bats, most of which is accomplished by bees, especially the honeybee. Studies have shown that urban settings are beneficial for honeybees as there are a variety of flowers and gardens around while fewer pesticides are sprayed in these areas. Wherever honeybees are kept, the surrounding flower and food production benefits from their pollinating activities. Another advantage of urban beekeeping is helping friends and neighbors 'bee informed' about the benefits of beekeeping while 'buzz'tin' bee myths.

There's been a ton of buzz in Edmonton with urban hives popping on the roofs of buildings downtown with locations including Grant MacEwan's downtown campus, the Shaw Conference Centre, Fairmont Hotel Macdonald, and Manasc Issac Architects. The trend of urban beekeeping promises to continue growing in Edmonton and beyond.

EDIBLE FRUIT BEARING TREES



2015
29,210

EDIBLE FRUIT BEARING TREES

51 SPECIES OWNED AND
MAINTAINED BY THE CITY OF EDMONTON

An edible fruit bearing tree is a species of tree that bears fruit that is consumed or used by humans, typically right from the tree or after freezing. These trees provide several environmental benefits including: providing shade and relief from the heat island effect, improving air quality, absorbing and filtering water, creating wildlife habitat and contributing to biodiversity, while also contributing to our urban food supply.

BEE KEEPING LICENSES



2015
29

BEE KEEPING LICENSES

Bees are the most important pollinator of our fruits, vegetables and flowers. Urban beekeeping, the practice of keeping bee colonies within urban areas, helps to increase the number of these important pollinators. Bee numbers are on the decline and urban beekeeping is necessary to strengthen bee populations.

SUSTAINABLE LIVING AND FOOD “DID YOU KNOW”?

Similar to other Canadian cities, Edmonton'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, Edmonton residents, on average, are using over five times more than their 1.7 hectare share of the global bioproductive space.

The Way We Green sets the framework for how Edmonton can become a world-class environmental leader. Each of us, as citizens, has a role to play to make Edmonton a sustainable city. Now that you are more aware of the State of Edmonton's environment, how will you contribute to its improvement?

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

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