

# SUSTAINABILITY

# What is sustainability?

Sustainability is a way of living that gives back as much as it uses.

In nature, it's the ability of things like forests or rivers to stay around for a long time, even when they are used by humans or animals. For example, if a forest is looked after properly and if people plant new trees and let them grow at the same speed they harvest the wood, the forest could provide wood forever.

Did you know there are forests that are over 1,000 years old? Now that's sustainability!

Did you know there are also cities that are more than 1,000 years old? By comparison, Edmonton is a very young city. Even though people have lived in this area for many years, Edmonton was officially declared a city in 1904, with a population of just over 8,000.

*How old is Edmonton now?*

Edmonton has been a city for over 110 years.

*How many people live in Edmonton now?*

According to the 2014 census, 877,926 people live in Edmonton.

Forests are like cities. Both have lots of life and provide habitat for the things that live there. The animals and people need many things like food, water, shelter and space.

*How do plants and animals in a forest interact with each other?*

*What provides a forest with food and water?*

*What provides Edmonton with food and water?*

In a forest, "waste materials" like leaves, twigs and dead trees collect on the forest floor and eventually decompose into the soil. This allows the soil to regain many of the nutrients used to grow the original plant.

People in cities tend to create a lot of waste.

*What happens to waste in Edmonton?*

*What do you think can help Edmonton to be sustainable so that one day it could celebrate its 1,000th birthday?*

# RESILIENCY

# What is resiliency?

Resiliency is the ability to withstand damage and to become strong and healthy again after something bad happens.

*Can you think of some things that are resilient?*

Trees are resilient because they have:

- roots that go deep into the ground to get water during dry seasons;
- hard bark that protects them from insects and sunburn; and
- needles or leaves that turn sunlight into food.

During a storm, tree branches will bend in the wind. Some might break if the wind is too strong, but the tree will not die from a broken branch. It still has roots to provide water, leaves to produce food and a trunk for support. It is resilient and will continue to grow.

How can Edmonton be resilient?

- We need water and food to nourish us.

*How can we make sure we always have a supply of fresh water and good food to eat?*

- We need clean air to breathe.

*What can we do to protect the air from pollution?*

- We need homes to provide us with shelter.

*What can we do to make sure our homes last a long time?*

*What would happen if there was a flood in your neighbourhood, or the power went out?*

The City develops plans and takes action so that:

- water and sewer pipes are in good working order;
- bridges are safe and high enough to avoid floodwater; and
- a public transportation system reduces traffic to keep our air clean.

Home and building owners become more resilient by:

- placing drain pipes to move water away from their building, to avoid flooding
- planting their own garden or buying vegetables from local farmers; and
- using sustainable transportation, such as walking, biking or taking public transit.

*What other actions make you or the City resilient?*



The Way We Green goal:  
Edmonton's air sustains healthy people and healthy ecosystems.

# Healthy Ecosystems: Air

Goal: Edmonton's air sustains healthy people and healthy ecosystems.

How many times do you breathe in a day? in a year? in your lifetime?

On average, people will breathe over 300,000 kg of air during their lifetime. That's about the same weight as two full grown blue whales, the biggest animal in the world!

*What could happen to your body if that air was dirty?*

There are cities around the world where the air is so polluted that it makes some people very sick.

Edmonton is located in a low-lying area, so air pollution tends to collect in and around the city. This means we must pay extra attention to keeping our air clean.

Exhaust from vehicles and smoke from backyard fire pits contribute to poor air quality, so we can help out by walking more (and driving less) and not having backyard fires when our air quality is poor.

*Can you identify some sources of air pollution in your neighbourhood?*

*What can you do about them?*

The City of Edmonton has many programs to prevent air pollution. One of them is called Be Idle Free.

Idling is when someone keeps their car turned on when they are stopped for a long time, such as waiting to pick someone up. Schools can let the City know if they want to become an Idle Free Zone.

*Do your parents idle their car to wait for passengers or to warm up the vehicle in the winter?*

Next time, remind them to turn off the car to keep our air clean. When warming up a car, a minute or less is best!



The Way We Green goal:  
Edmonton's air sustains healthy people and healthy ecosystems.



# Healthy Ecosystems: Air | Global Leadership

Do you know Andrew Ference?

He's an Edmonton Oilers hockey player and he really likes the environment – in fact, he's well known for riding his bicycle to hockey practice, driving an electric car and organizing outdoor workout sessions.

Andrew Ference is a Global Leader. He uses his fame and influence to get people involved with environmental issues. He has not only helped other players to go green, he also helped the NHL to change its environmental practices. Andrew also shows leadership on many social issues.

People pay attention to what Andrew does. Now, because of his actions, more people are paying attention to environmental issues.

In 2014, Andrew took his environmental leadership to another level by helping the City of Edmonton declare Clean Air Day with Mayor Iveson. He even rode his bike to the event.

*Do you think you have to be famous to be a leader?*

*Can you name someone you know who isn't famous but leads people to do something good for the city or for other people?*

*What can you do to set a good example, to show you care about the environment and, specifically, about clean air?*

*Who do you consider to be a Global Leader?*





The Way We Green goals:

(1) Water quality in the North Saskatchewan River sustains healthy people and ecosystems. (2) Edmonton's water supply meets its needs.

# Healthy Ecosystems: Water

Goals: (1) Water quality in the North Saskatchewan River sustains healthy people and ecosystems.  
(2) Edmonton's water supply meets its needs.

## Water Quality

Where does our water come from?

Edmonton gets all of its drinking water from the North Saskatchewan River. It is treated at the E.L. Smith and Rossdale Water Treatment Plants so that it is safe to drink, and then moved through underground pipes to our homes and buildings across the city for us to use and enjoy.

Where does the water in the river come from?

The river fills with water from snowmelt and rainfall upstream of Edmonton, and melting glaciers in the Rocky Mountains.

Where does our water go after we use it?

Water that goes down the drain is moved by a different set of underground pipes to be treated at the Gold Bar Wastewater Treatment Plant. Water that we use, such as for flushing the toilet, washing our hands and brushing our teeth, is carefully cleaned before it is returned to the North Saskatchewan River.

When it rains in Edmonton, the water moves quickly into the sewers, creeks and eventually, the North Saskatchewan River. On its way, it can pick up loose soil and debris. Trees and shrubs will stop the soil and debris from entering the river, helping to keep the river clean. Debris in the river can be harmful to fish and other aquatic animals.

*What can you do to help keep Edmonton's water clean?*

## Water Conservation

It may seem like there is a lot of water, but that's because we don't think about it very often. Instead, we expect it to be delivered to our homes and schools and fitness centres across the city. However, it takes a lot of equipment and energy to treat water and move it through pipes for us to use, so wasting it is not a good idea.

*What are some ways you conserve water?*

Did you know, compared to other cities across Canada, Edmontonians use less water? We use an average of 195 litres per person per day, compared to the Canadian average of 250 litres per day. Keep on conserving!



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# Healthy Ecosystems: Water | Student Leadership

Here in Edmonton, we are lucky. If we want water, all we have to do is turn on a tap and clean, drinkable water is pumped to us.

Finn Case is from Edmonton and when he was in Kindergarten, he learned that not everyone in the world has access to clean drinking water. People in Africa often have to walk more than 5,000 steps just to get a bucket of water – and most times, that water isn't even clean!

*How far would you have to walk right now if you needed a drink of water?*

Finn decided to do something about it. That year, he and his class raised \$77 towards building a well for a village in Uganda. Not satisfied with that amount, he has continued his fundraising efforts through Ryan's Well Foundation, which was started by a boy much like Finn.

Finn has raised over \$35,000 to build three wells for villages in Uganda, as well as washrooms and hand wash stations.

*What can you do to conserve water in Edmonton?*

*What could you and your classmates do to help others who do not have clean water to use?*



The Way We Green goal:  
Edmonton is full of nature – a place where in the course of everyday life, residents experience a strong connection with nature.

# Healthy Ecosystems: Land

Goal: Edmonton is full of nature – a place where in the course of everyday life, residents experience a strong connection with nature.

Here in Edmonton, it seems like we have a lot of land, but it is what we do with that land that matters most.

The City must deal with many land issues such as:

- deciding if lands will be used for farming or building houses;
- if the city should add more houses to where there are already houses, or if it should grow out, around the edges of the city;
- how much land should be left undeveloped and protected as natural habitat;
- making sure land is not polluted from the way it is used; and
- making many other decisions when people ask to develop lands in Edmonton.

Have you heard about the Blatchford Redevelopment? This is an amazing example of using a piece of land in the middle of the city to develop a brand new, sustainable community.

Blatchford will be built on land that used to be an airport, and will one day be home to 30,000 citizens! The new community will be designed so that people can walk or take the LRT to move around and be close to schools, hospitals and shopping. The homes in Blatchford will use very little energy, even in winter!

When deciding how the city will grow and where new homes will be built, it is also important to preserve wetlands and other natural habitats so that wildlife (such as plants, fish and birds) can continue to live here.

*Can you name any plants or animals that live in a wetland?*

*Are there any natural areas or wetlands where you live?*

*Have you visited a natural area? What did you see?*

An area is said to be biodiverse when there are many different types of plants and animals living in that area.

**Bio** means life.

**Diversity** means variety.

**Biodiversity** means the variety of life on earth.

Wetlands are often described as being as some of the most biodiverse ecosystems on earth!

Did you know, Edmonton's River Valley is the largest urban park in Canada? It has more than 160 kilometers of maintained pathways and 20 major parks.



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# Healthy Ecosystems: Land

Heather works with the City of Edmonton. She also loves birds and creating biodiversity in her backyard.

Heather enjoys spending her free time making beautiful bird boxes that give birds a safe place to make their nest. She makes these nesting boxes out of wood scraps and paints them using leftover paint from the Eco Station.

By doing this, Heather is creating a habitat where birds may not have been able to live and this creates a more diverse ecosystem.

*What else, in addition to a nesting site, does a bird need to make an area their home?*

You can create biodiversity in your yard or community by making it friendlier for animals. This might include building bird boxes, planting native plants or helping your parents build a pond.

*What does it mean to naturalize your yard?*

It means replacing some or all of the lawn with plants and shrubs that are found in nature in the area. These are often called native plants.

Plants native to Edmonton need little water because they are used to our climate and weather patterns. They require less work than a lawn that needs to be mowed and watered.

A naturalized yard provides birds and small mammals with the **habitat** they need: food, water, shelter and space.

*How do you appreciate nature?*

*What sort of things can you do, or what do you already do, to conserve nature?*





The Way We Green goal:  
Edmonton generates zero waste.

# Solid Waste

Goal: Edmonton generates zero waste.

Have you ever been to the Edmonton Waste Management Centre? It is one of the best waste management facilities in the world!

Edmonton produces 230,000 tonnes of waste each year. That's the same weight as 33 male African elephants! All of that goes to the Edmonton Waste Management Centre to be sorted, recycled and turned into compost.

*Why are reducing, reusing and recycling important?*

These words are important because they are the three Rs of waste management.

By reducing our waste, reusing what can be reused and recycling anything that we can't reuse, we are helping to create a more sustainable way of life.

*Is one of these actions more important than the others?*

(hint: think about the order of the 3 Rs)

Even though Edmonton is a leader in managing waste, we have a long way to go to reduce the amount of waste we produce in the first place.

*What can you do to help reduce waste?*

*Have you ever wanted to recycle something but there was no blue bag or recycle bin around? What did you do?*

*Think of an item in your home that is no longer being used. Now try to think of how that item might be reused for an entirely new purpose. Will you have to bend it or cut it, or can you use it just like it is, but for something else?*



The Way We Green goal:  
Edmonton generates zero waste.

# Solid Waste | City Leadership

Edmonton's Waste Management Centre is a world-leading waste processing and research facility. It includes recycling, composting, landfill gas recovery and waste-to-biofuels technology.

But it wasn't always this way. Edmonton started curbside recycling in 1988 when citizens like you and me pressured the City to manage waste differently. A few City leaders also saw that recycling was a great opportunity for Edmonton.

Over time, Edmonton began adding new services and new technology, making it a leader in managing waste in an environmentally friendlier way.

*Did you know that the Waste Management Centre recycles old paper and turns it into brand new paper?*

*Did you ever think you could fuel a car using garbage?*

Edmonton is now turning garbage into fuel that one day may run your car. This amazing process occurs at the Waste-to-Biofuels Facility, where garbage is burned in a special machine that creates fuels.

*What happens to your old computers, phones and televisions?*

These, and other electronic items, are known as e-waste, or electronic waste. They shouldn't go in the garbage. Instead, they should go to an Eco Station. From there, they will end up in a sorting area at the Waste Management Centre and separated into piles for reusing, recycling and special handling because they contain hazardous materials.

*How can we ensure the Waste Management Centre doesn't become overrun with garbage?*

Answer: Practice the 3 Rs – Reduce, Reuse and Recycle.

*Which R do we need to practice the most?*

Answer: Reduce.

fresh



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.

# Food

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.

This City goal has many big words!

**resilient food system** – Like many other cities, Edmonton relies on shipments of food by truck, rail and air, to keep store shelves stocked. Some food is shipped from across the ocean! This goal is about helping Edmonton to redesign its food system so that we are more supportive of local farmers selling their food directly to citizens through markets, and also by encouraging citizens to grow food in their own yards or community gardens. That way, if a truck that is shipping food breaks down, or if a crop in another country is flooded out or affected by drought, citizens will still be able to buy and grow food locally.

**cultural sustainability** – By eating foods that we grow closer to home, we help to maintain a local culture to our foods. What food do you think of when someone says Edmonton? What foods make you think of Florida? China?

**financial sustainability** – By buying food from local farmers, we keep more money in this local area, enabling farmers to have more money to spend here. By growing our own food, it means we don't have to spend as much of our money on food and have more money to spend on other things.

**social sustainability** – Food has a way of bringing people together. Think about a big family gathering, or the number of people you see at a farmers' market or a food festival. People are attracted to food in many ways, and happy people help to keep our city vibrant.

**environmental sustainability** – When food travels across long distances, it means that fuel is burned (in the plane, ship, train or truck). When we burn fuel, we contribute to air pollution, and also emit more greenhouse gases into the atmosphere. Growing food locally contributes to a healthier environment.

Locally grown food has a number of benefits:

- it supports local farmers;
- it promotes food sustainability in Edmonton;
- it reduces transportation costs; and
- it reduces how far food travels, which reduces pollutants from vehicle emissions and burning fossil fuels like gasoline and diesel.

The City is taking leadership on this issue because many people showed up at City Hall to tell City Council that food sustainability means a lot to them. Councillors must make very difficult decisions when it comes to food. Do they preserve farmland for farmers, or do they provide spaces for community gardens, or do they encourage citizens to grow food on their balconies or in their yards?

*What can City Council do to encourage citizens to buy or eat locally grown food?*

City Council decided that the City should have a food strategy to help guide their decisions.

The City's food plan, *fresh*, was developed to ensure that we always have access to healthy, local and fresh food.

You can help Edmonton become sustainable by growing fruits and vegetables in your backyard and encouraging your parents to buy from local farmers' markets.

*Does your family or school have a vegetable garden?*

*Have you ever grown something you could eat?*

*Have you ever eaten something fresh from a garden?*



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# Food | Community Leadership

*Do you have a fruit tree in your yard? Or rhubarb or raspberry plants?*

**Fruits of Sherbrooke** was started by a group of friends who noticed that in their neighbourhood of Sherbrooke, there were a lot of fruit trees, fruit bushes and rhubarb plants that were unused and whose fruit just rotted in the summer and fall.

They thought “Why are we buying fruits at the grocery store if there is so much in our backyards?” They decided to do something about it and Fruits of Sherbrooke was born.

They collect or “rescue” fruits from the backyards of people who either can’t pick their own fruit or are unable to eat all the fruit their plants produce. They turn the “rescued” fruit into jams, preserves, sauces and many more yummy treats. This way, the fruit doesn’t go to waste.

It’s a wonderful program because the fruit they use would normally end up being trucked to the Edmonton Waste Management Centre.

**Operation Fruit Rescue Edmonton** (OFRE, pronounced “offer”) started after several citizens noticed that many people had fruit trees but, for whatever reason, did not pick the fruit. This meant a lot of fruit rotted on the ground, or was raked up, bagged and put out as garbage.

Now OFRE will send volunteers to private residences to pick fruit when the homeowner requests it.

- One quarter of what the volunteer picks is given to the homeowner.
- One quarter goes to Edmonton’s Food Bank or other local, charitable organizations.
- One quarter goes to the volunteer fruit pickers.
- One quarter goes to OFRE for processing and preserving.

In addition to collecting fruit, OFRE also organizes canning and preserving events during the harvest season.

To volunteer with this organization, please visit [operationfruitrescue.org](http://operationfruitrescue.org).

*Has food ever gone to waste in your home?*

*What are things you can do to make sure food is not wasted?*





The Way We Green goals:

- (1) Edmonton's sources and uses of energy are sustainable.
- (2) Edmonton is resilient to disturbances, including climate change, that could affect its energy supplies and distribution system.
- (3) Edmonton is a carbon-neutral city.

# Energy and Climate Change

- Goals: (1) Edmonton's sources and uses of energy are sustainable.
- (2) Edmonton is resilient to disturbances, including climate change, that could affect its energy supplies and distribution system.
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The City takes energy and climate change very seriously. Scientists explain that weather is different from climate.

**Weather** is the current or short-term state of the atmosphere. Weather includes temperature, precipitation, humidity and wind. It might be warm and sunny in the morning, but cloudy and cool in the afternoon. This is weather, which can change often.

**Climate** is the average weather over a long period of time. Edmonton generally has cold winters, so we would say that it has a cold winter climate.

**Climate change** is the long-term change in weather patterns over a long period of time. Weather pattern changes might include droughts, floods, strong winds or heavy snowfalls that seem to be unusual.

We often talk about energy when we discuss climate change. That's because most of Edmonton's energy is produced by burning **fossil fuels**.

Fossil fuels are fuels formed from dead prehistoric plants and animals. The most common forms are coal, petroleum (crude oil that is used to make gasoline and diesel) and natural gas. These fuels are finite and cannot be replaced.

When fossil fuels are burned, **greenhouse gases** are released. Greenhouse gases absorb and trap heat in the atmosphere, making the planet a comfortable temperature.

The concern is that we are putting too many greenhouse gases into the atmosphere, causing a warmer climate on Earth than would naturally occur.

The City wants to reduce the amount of greenhouse gases we produce and is taking action in a number of ways.

The City is testing out an electric utility car, it lends bicycles to City staff for attending meetings instead of driving and it is expanding the LRT system to provide citizens with more choices to move around the city.

It is also in the process of converting all street lights to LEDs, which use a lot less power than regular bulbs and last much longer.

The new energy plan, *Edmonton's Community Energy Transition Strategy*, calls for a number of actions, such as more solar energy and supporting electricity from green sources, such as wind or solar, for City buildings.

In all these ways, Edmonton is taking action to reduce its greenhouse gas emissions.

Sometimes the word "carbon" is used instead of the word greenhouse gas. That is because carbon dioxide is an important greenhouse gas, produced when fossil fuels and wood are burned. By planting more trees, Edmonton is removing even more carbon from the air.

*How often does your family bike, walk or take the LRT somewhere instead of taking the car?*

*Have you ever planted a tree?*



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# Energy and Climate Change | Business Leadership

Manasc Isaac is an architectural firm in Edmonton. Their goal is to design new buildings that use as little energy as possible, and in some cases, the buildings make more energy than they use. They also help to make old buildings more energy efficient, so they use less energy.

These are some of the ways that Manasc Isaac conserves energy in their office building in downtown Edmonton:

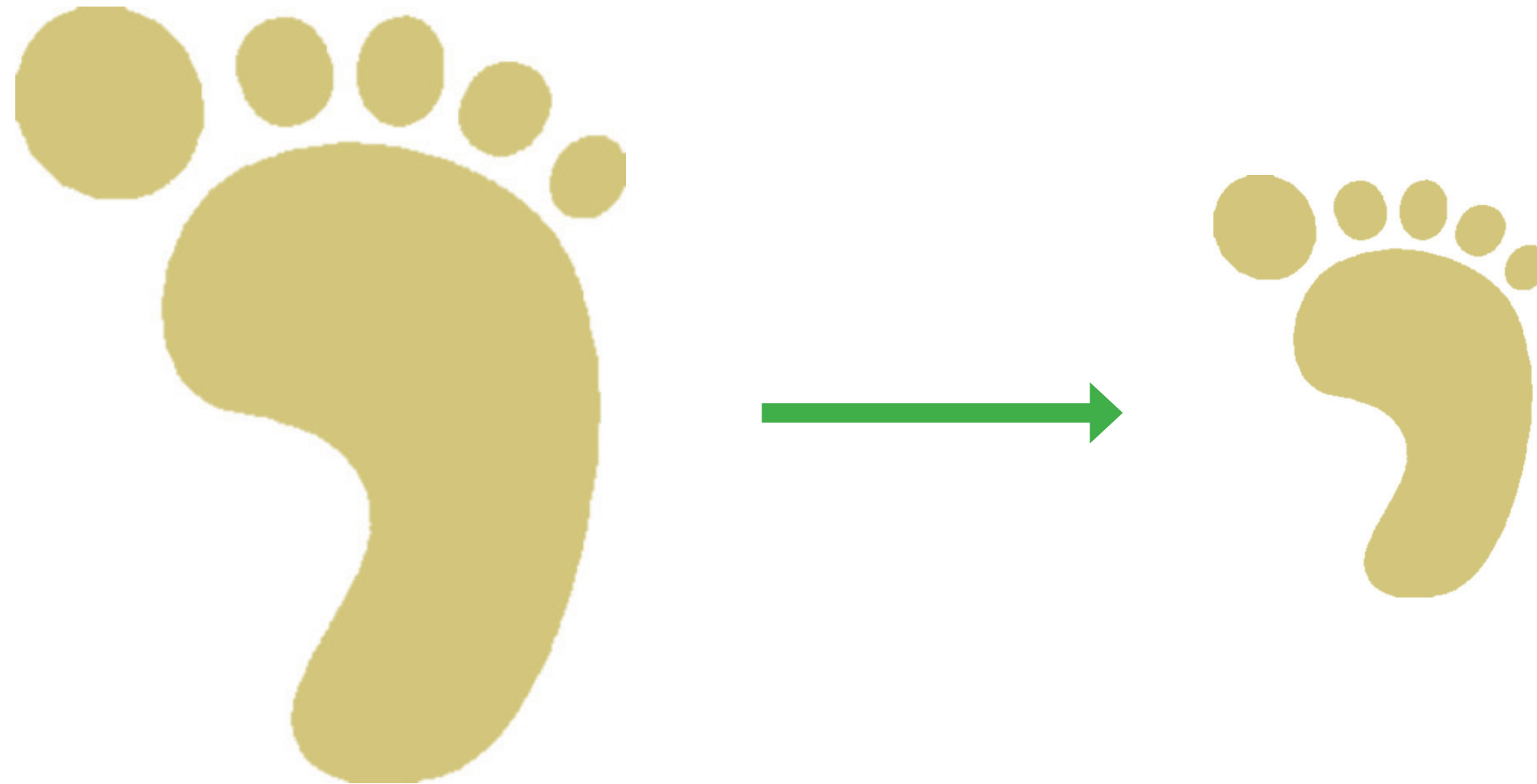
- solar panels on the roof generate electricity;
- LED lighting reduces energy use;
- Energy Star-rated appliances use less energy;
- herbs and vegetables are grown on the roof and used by their chef to prepare healthy lunches for staff and guests, reducing the need to transport food to the office;
- free bus passes are provided to staff who request one;
- bicycle storage and full showers are available on site; and
- the office Smart Car is available for staff who need to visit construction sites or attend meetings.

We need energy for many things, from turning on the lights to cooking dinner to heating our homes.

It's good practice to use as little energy as you can; this is called "energy conservation". You can conserve energy by turning off lights when you are not in the room or by turning off appliances, televisions and computers when you are not using them.

Wearing a sweater instead of turning up the heat, or walking or riding a bicycle instead of riding in a vehicle also helps to conserve energy.

*What ways can you conserve energy in your home?*



The Way We Green goals:

- (1) The City of Edmonton strives for sustainability and resilience in all it does.
- (2) Edmontonians' lifestyles contribute significantly to the city's sustainability and resilience.

# A Foundation for Success

Goals: (1) The City of Edmonton strives for sustainability and resilience in all it does.

(2) Edmontonians' lifestyles contribute significantly to the city's sustainability and resilience.

The City of Edmonton is working towards being greener, and many green actions are listed in its environmental plan, *The Way We Green*. More recently, City Council approved a community energy transition strategy, which will help move our city into a more energy sustainable future.

Our success relies on the actions of its citizens. That includes you!

How big is your footprint?

Everyone in the world has a footprint—not just what is left behind when you go for a walk, but an **ecological footprint**.

An ecological footprint is a way of measuring the sustainability of a person's lifestyle. It compares that person's use of resources with Earth's ability to supply those resources.

*What kind of resources do people use?*

Examples include:

- food
- air
- water
- trees (for building homes and making products such as paper)
- fossil fuels (like coal and oil for electricity and power, and to make products such as plastic)
- minerals (like iron, nickel, etc. for manufacturing products)

Ideally, we should have an ecological footprint of 1.8 hectares or less. This means that the Earth has enough space and resources to provide for every person in the world.

Edmontonians have an ecological footprint of 7.62 hectares per person. This means that if every person in the world lived the way people in Edmonton do, we would need at least four planet Earths to provide for all our needs!

*Can you think of some ways you could reduce your ecological footprint?*

Some examples are:

- taking shorter showers;
- using the dishwasher and washing machine only when they are full;
- turning off the lights;
- unplugging devices when not in use (including chargers!);
- taking transit, biking or walking instead of driving;
- buying locally grown food;
- keeping water in the fridge instead of running the tap; and
- printing double-sided.



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# A Foundation for Success | Personal Leadership

This is Lise Robinson. Growing up in Lafond, Alberta and later living in Cold Lake First Nations, Lise learned from a young age the importance of living a sustainable lifestyle.

Lise grew up on a farm and believes that whenever we take things, we should also give back. Her parents and grandparents before her lived sustainable lifestyles, which they passed on to their children.

Living sustainably doesn't have to be complicated. She recommends using everything you have, including eggshells. Instead of throwing her eggshells out, Lise puts them in her garden, providing her plants with many nutrients. Lise also does not like to waste anything. If she has extra food that could be enjoyed by others, she will donate it to a local homeless shelter.

*What do you do with extra food? Have you ever thought about donating what you don't need?*

Lise also seeks to conserve in other areas of her life. She keeps a jug of water in her fridge and takes the LRT to work instead of driving. She says she appreciates the different transportation options in the city, including the many cycling and walking trails, because it makes our city much greener.

*What are some changes you could make to your life to be more sustainable?*

Education is also an important part of Lise's life. She thinks the sooner children can be introduced to living green, the better it will be for the Earth. Lise chose from a young age to pass her love of sustainability on to her children, and her son is now studying the uses of herbs in medicine. She reminds students to "not take more than you need and leave something behind for others, which is a good way to live green."

*Do you ever take more than you need?*

Lise tries to always pass on what she doesn't need. Living on Treaty Six territory is a privilege, one that provides us with clean water and air. These are sacred elements that we all need to thrive. Being mindful of this is how we can all make a difference in being greener and treating our Mother Earth with the respect she deserves, for we all are sustained by her.

*How can you be mindful of the way the Earth sustains us?*