ATTACHMENT 1

PARTNERSHIPS DRIVING

REDUCTION
REUSE
RECYCLING
RECOVERY

UPDATE TO SM4RT LIVING

THE YORK REGION WASTE MANAGEMENT MASTER PLAN

WASTE MANAGEMENT
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york.ca/waste

York Region


HOW WILL YOU INSPIRE
PEOPLE IN YOUR COMMUNITY
TO STRIVE FOR
A MORE SUSTAINABLE
FUTURE

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1. Introduction

A plan that supports sustainability

This document updates the SM4RT Living Plan, York Region's Waste Management Master Plan. First developed for York Regional Council endorsement in 2013, the master plan commits to "4Rs" in waste management in York Region that:

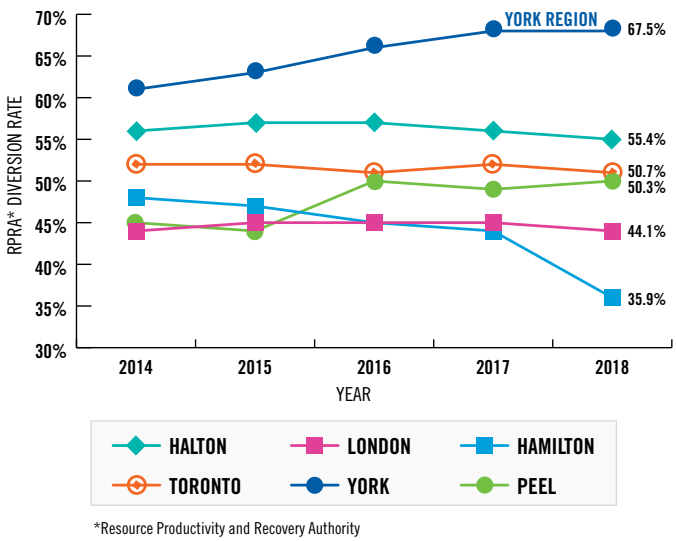
- **Reduce** the amount of waste generated in the Region
- **Reuse** items instead of discarding them
- **Recycle** as many materials as possible into new products
- **Recover** energy from waste that cannot be managed in other ways

These objectives gave rise to the master plan's alternative title, the SM4RT Living Plan, which is widely used in public education efforts.

The master plan was originally developed with a 25 to 40 year time horizon to extend from 2039 to 2054. The initial plan outlined specific actions for the first five years, at which time progress would be assessed and an update prepared. With this update, the plan now extends to the years 2044 to 2059 and outlines actions for the next five years.

This Master Plan is built on York Region's leadership in waste management. The Region has ranked first among large Ontario municipalities in diversion rate since 2012, and has placed first among all Ontario municipalities. Chart 1 shows the performance of the Region against its peers in southern Ontario.

Chart 1: Verified Provincial Diversion Rates Large Urban Municipal Category (2013-2018)



*Resource Productivity and Recovery Authority

From its inception, the master plan combined successful diversion programs with efforts to prevent waste. This approach reflected the reality that the Region had already implemented the most cost-effective waste diversion programs. Going forward, the best way of containing costs and achieving environmental benefits would be to reduce the amount of waste produced.

This update takes the same balanced approach. As well as reducing operating costs, combining cost-effective diversion with prevention leverages and extends the life of waste management infrastructure. It also engages the community – whether residents, local municipalities or non-profit partners – in innovative programs to prevent waste.

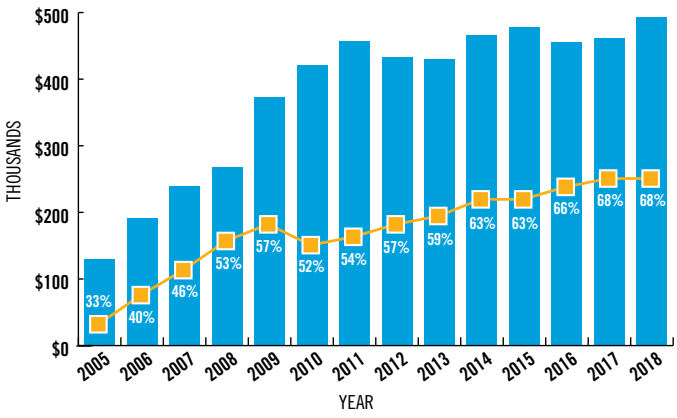
When it was developed, the SM4RT Living Plan's emphasis to prevent waste put York Region and its nine local cities and towns at the forefront of waste management thinking among governments in Canada. Since then, other municipalities and the federal and provincial governments have moved in the same direction.

A major reason for focusing on prevention is the growing cost and complexity of waste diversion. The blue box and green bin programs were initially highly successful at diverting recyclables and organic waste respectively. But it has become hard if not impossible to find end markets for many blue box materials in recent years. With a new provincial framework moving responsibility for the blue box to producers, the Region must now focus on ensuring a smooth and fair transition while also managing cost pressures.

Once blue box transition is achieved, the Region will remain responsible for green bin organics and other waste that does not go into the blue box. The green bin is at present the most costly curbside waste stream to process. Opportunities to divert other household waste, for example mattresses, are limited by lack of end markets and/or high costs compared to the small increase in diversion rate that might be achieved.

A Regional analysis (Chart 2) shows that over the past 13 years, the cost of increasing the diversion rate by one percentage point has gone from $129,000 to $494,000:

Chart 2: Cost per percent of diversion

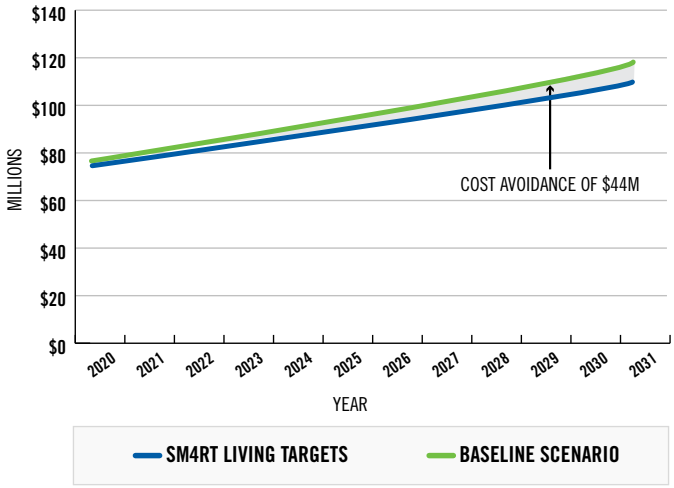


This underscores that trying to increase diversion beyond existing programs is not likely to be economically sustainable in the long run.

Conversely, reducing the tonnage of waste that must be processed is already bringing cost savings. Implementation of the SM4RT Living Plan is approaching cost neutrality. This means enough money was saved by reducing tonnage below the 2014 baseline level to pay the costs of the program, which are roughly $1 million a year.

These savings are expected to grow, as the graph below shows, without requiring significant additional program costs. Achieving the 2031 garbage and green bin aspirational targets set out in this update has the potential to result in over $40 million dollars in total avoided costs for the Region and local towns and cities.

Chart 3: Forecasted cost avoidance from implementing SM4RT Living Plan



People, organizations and businesses across society are also coming to realize that preventing waste is essential to a healthy and sustainable future. This has led to a strong focus on the concept of the circular economy – one in which resources are used and reused continuously, not used once and discarded.

This update builds on and strengthens the Region's initial commitment to preventing waste and reflects the move toward a circular economy. It also responds to a rapidly changing legislative landscape as provincial and federal governments address critical issues in waste management. To support financial and environmental sustainability for the Region, it sets out specific actions in the next five years to reduce long-term costs of waste management operations and infrastructure.

Visionary goal, mission and objectives

This update to the SM4RT Living Plan includes the following visionary goal:

This goal, which grew out of discussions and engagement during the development of the update, explains the desired outcome of SM4RT Living in a way that is simple and easy to grasp. It also reflects the reality that waste is a global concern. Its costs are measured not just in dollars, but in environmental, climate and health pressures in Canada and around the world.

Underlying this goal, conversely, is the recognition that by aspiring to ensure nothing goes to waste, we create a world that is wealthier in many different ways: not just in material resources, but also in environmental health and social well-being.

In pursuing the visionary goal, the Region and its nine local municipalities will take as their mission:

Leading the way through partnering, innovating and inspiring change.

The efforts of the Region and local municipalities will be guided by three main objectives:

1. Successfully navigate legislative changes
2. Use resources and infrastructure more strategically to achieve SM4RT Living
3. Inspire people across the region to embrace SM4RT Living and advance the circular economy

The first two objectives are driven by what might be considered the traditional role of municipalities in delivering waste management. Objective one involves successfully navigating a constantly changing landscape of mandates, policies and statutes, while objective two speaks to the importance of doing more with fewer resources by delivering services and using infrastructure as efficiently as possible.

The third objective is somewhat different. It recognizes that to achieve the plan's vision, the Region and its local municipal partners need the help of everyone in the community. Change is already happening as people consider how they can use resources more wisely, and the role of York Region and the local municipalities is to ignite further action. This is in line with the goal area of Vision 2051: transcending traditional ideas or solutions through innovation and creativity.

Each objective has several action areas associated with it. Together, the visionary goal, objectives and action areas constitute the workplan for the next five years of the SM4RT Living Plan. The workplan appears as Chapter 4 of this document, starting on page 36. Chapter 5 speaks to measuring and reporting on progress while Chapter 6 explains how it will be implemented in a rapidly changing world.

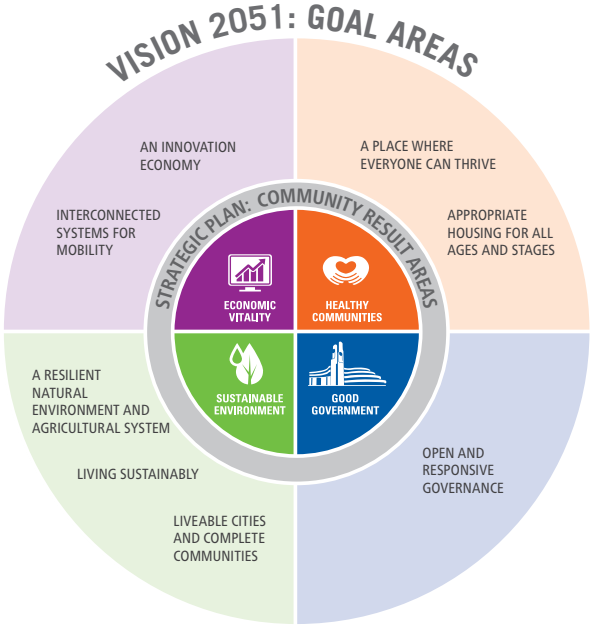
SM4RT Living and Vision 2051

Vision 2051 establishes the Region's long term vision and sets the foundation for all Regional strategies and initiatives. The 2019 to 2023 Strategic Plan: From Vision to Results represents the Region's commitment to making progress in four priority areas: economic vitality, healthy communities, sustainable environment and good government.

While at present SM4RT Living most clearly supports sustainable environment and good government, this update shows how it can also support the other two goal areas.

Economic vitality: Jurisdictions across Canada and around the world are embracing the circular economy. The circular economy is not just as a way of tackling waste management problems, but to expand local economies with new activities and connections, for example through linkages among agriculture, nutrition and prevention of food waste.

Healthy communities: There is a natural connection between SM4RT Living and health. Buying local produce, meal planning, growing food and preparing meals from scratch are all well-recognized as benefiting personal health. These practices also help to reduce waste by creating a more mindful attitude to food and nutrition. Beyond physical health, the sense of connection created by SM4RT Living initiatives like Repair Cafés shows the potential for its role in building stronger communities. The update to the plan will investigate the links between SM4RT Living goals and other Regional initiatives around healthy communities and social well-being, and look for ways that waste prevention programs can enrich people's lives and trigger their creativity.



Waste is part of a global picture

Increasingly, how waste is generated and managed is understood to be part of a bigger picture that involves the health and sustainability of the earth's land, air, water and communities:

- Lightweight plastics like bags, straws and packaging materials easily get into waterways – every year, for example, an estimated 10,000 tonnes of plastic enter the Great Lakes. Plastics in the environment harm wildlife and gradually break down into tiny particles that can end up in drinking water. In the world's oceans, plastic debris makes up the bulk of immense "garbage patches" trapped by currents.
- The Canadian government is planning to ban select single use plastics starting in 2021, as part of Canada's commitment under the 2018 Ocean Plastics Charter.
- Wasted food and discarded clothing account for an increasing share of garbage. Wasted food alone costs Canadian households more than $1,500 a year on average. Clothing is often discarded after only a few wearings, and once in the garbage, its economic value is lost.
- Waste also has huge implications for climate change. The United States Environmental Protection Agency has estimated that roughly 42% of all greenhouse gas emissions in the USA are caused by the production and use of goods. Waste items like food in landfills produce methane, which is as much as 30 times more powerful than carbon dioxide as a greenhouse gas. The Region's Climate Change Action Plan recognizes the importance of reducing waste and includes a number of actions in support of this goal.

Waste generation around the world is accelerating as are the problems it creates. Population growth, rising incomes and the spread of what is called the throwaway society are all contributing factors. In a report entitled *What A Waste,* the World Bank noted that global waste production is growing faster than population and that it could increase by as much as 70% by 2050. Numerous other global organizations, including The United Nations Environment Programme,

Conservation International and the World Wildlife Fund for Nature are urging and supporting action to reduce garbage because of its environmental, climate change and health impacts.

Building on success, addressing new challenges

Successful initiatives and actions carried out through the initial SM4RT Living Plan have started the Region on a path to less waste and greater sustainability. The Region had a waste diversion from landfill rate of 94% in 2018 and has consistently ranked first in waste diversion among peers in the large urban category since 2012. The average waste generated per resident has continued to decline from 328 kilograms in 2014 to 299 kilograms in 2018.

At the same time, however, waste management faces new and evolving challenges from the local to the global level, as Chapter 2 outlines. This Plan aims to address these challenges as it continues to inspire change at the household, business and community level.

> "Solid waste management is a critical—yet often overlooked—piece for planning sustainable, healthy, and inclusive cities and communities for all."
>
> World Bank, *What A Waste, 2018*

Service delivery depends on key partnerships

The Region relies on several important partnerships to deliver waste management services:

- The nine local cities and towns manage residential curbside collection of source-separated organics (the "green bin"), blue box recyclables, yard waste and garbage. In some cases, local cities and towns manage collection services for multi-residential buildings as well as from business improvement areas (BIAs).
- Local cities and towns deliver waste to Regional facilities. Most blue box materials are sorted at the Region's materials recovery facility. In addition, the City of Markham operates four municipal recycling depots. Other waste streams are transferred to contractor for processing.
- The Region provides waste and diversion drop-off depots at its Community Environmental Centres and the Georgina Transfer Station for residents and small businesses. York Region also operates Household Hazardous Waste depots in Markham and East Gwillimbury.
- Community partners, such as NewMakeIt and the York Region Food Network, work with the Region on innovative programs that combine waste prevention efforts with community building, such as Repair Cafés, composting and food preparation workshops and lending libraries for tools, sports equipment and small kitchen appliances.
- Several charitable organizations collect clothing and other textiles for resale, often in partnership with the Region and local cities and towns.
- Through the Ontario Food Collaborative, a group initiated by the Region in 2014, municipal waste and public health professionals share knowledge and resources to support and advocate for food waste prevention and food literacy.
- The Region co-owns the Durham York Energy Centre in Clarington, which generates energy-from -waste from materials that cannot be recycled or reused and has contracted with owners of other energy-from-waste facilities to use a portion of their capacity.

The Region is mandated by the provincial government to deliver waste management services and provincial policies have a major impact on its activities. Federal government decisions and direction also affect waste management in the Region.

Governments, partners and municipal efforts have helped to achieve high levels of participation and diversion from landfill across the region. Improving SM4RT Living by strengthening and extending the partnership network and leveraging changes at the provincial and federal level are important elements of this master plan update.

Listening, learning and working together

Recognizing the critical role of local cities and towns in waste management, the Region continues to rely on their insights, knowledge and direct experience with households.

Local cities and towns took part in workshops with Regional staff on several occasions, focusing on:

- Waste diversion and reduction in multi-residential buildings
- Single-use packaging and litter
- Implementation planning
- Reporting and data measurement

Workshops were supplemented by working groups with Regional and local municipal staff and with one-on-one meetings with Mayors and York Regional Councillors as the update was finalized.

A partnership forum brought together a range of community partners with an interest in SM4RT Living goals. Local municipalities, conservation authorities and other external groups and other Region departments were invited to take part in the Forum, which helped to identify potential new relationships and synergies among partners and with municipalities.

Three engagement events were designed to conduct community-based research, get a glimpse into the changing dynamics of people's lives and understand ways to motivate them to make a shift in their consumer habits.

They comprised:

1. A "SM4RT Fashion Shop" at an outdoor community movie night in Richmond Hill
2. A "SM4RT Music Shop" at a Markham music festival
3. A "Jam Session" involving seniors and youth at a community hub in Richmond Hill

These sessions provided insights into people's thoughts and feelings about consumption and waste, and key outcomes are discussed in more detail in Chapter 3. Findings will help the Region, local cities and towns and community partners co-design more effective ways of engaging as this update is implemented, as discussed in Chapter 6.

Appendix A summarizes partnership and engagement findings.

What was evident at every workshop and in every conversation was an eagerness to get involved in achieving SM4RT Living goals – whether at the personal or household level, as a leader of social change, or through municipal policies, actions and partnerships. This update is intended to build on this eagerness to find solutions together.

The Region thanks everyone who gave their time and insights as the Plan was updated and looks forward to continuing to build relationships critical to its success.

2. What SM4RT Living has achieved, and what lies ahead

Leading efforts to prevent waste

SM4RT Living represents the Region's strategy for waste management over the long term, while continuously improving service and sustainability.

The first five years of implementing the SM4RT Living Plan saw the Region, local cities and towns and other partners move ahead on 32 priority initiatives. Work included piloting new programs, carrying out research, collecting data and developing policies. SM4RT Living programs helped to speed adoption of consumer trends like buying second-hand, repairing instead of replacing items, renting or sharing instead of purchasing and choosing durable products with minimal packaging.

Major achievements

Curbside Giveaway Days, where residents have an opportunity to place unwanted, reusable items at the curb for others to take, was one of the earliest successes of the plan. The frequency and reach of these events has increased from 16 events in three municipalities to 40 events hosted in eight municipalities in 2019. Residents report high levels of satisfaction with the event and good success at re-homing furniture, toys and other household items.

The Region was one of the first municipalities to create a food waste reduction program. The award-winning **Good Food Program,** launched in 2015, provides tips on planning and preparing meals, saving time and money, eating healthy and wasting less. In 2018, more than 4,300 people were engaged at 23 Good Food outreach events. Partnership and collaboration have been key to success. The program was developed in collaboration with Community and Health Services, drawing strongly on their expertise in nutrition and food safety. The collaboration has continued with program delivery, with both departments sharing materials and key messages. In 2019, the Economic Strategy division of the Corporate Services Department joined the collaboration because of the strong alignment with the Region's Agriculture and Agri-food Strategy. The three departments worked together on a series of outreach events and three successful workshops at a popular food market in the Town of Newmarket, conveying key messages about health and nutrition, local food and food waste reduction. This successful internal cross-collaboration has increased the reach of all three programs and will be expanded in 2020. Community partners have also played a major role in the Good Food program's success. Since 2016 the Region has worked with York Region Food Network to help deliver hands-on workshops for a variety of audiences. The Region recently began working with food retailers and farmers markets to educate consumers as they are shopping for food.

The Region has also been active in advocating to the provincial government to recognize the importance of reducing avoidable food waste. Recent provincial policy such as the **Food and Organic Waste Policy Statement** aligns with the SM4RT Living Plan's food waste reduction strategy. The new Canada Food Guide reflects similar messaging to the Good Food Program promoting mindfulness around eating habits and cooking more often at home.

Local cities and towns lead **textile collection programs** with over 180 municipal collection bins throughout the region. Markham has a successful program with over 7,500 tonnes of textiles collected through 147 publicly accessible bins and 63 multi-residential bins.

In 2018, The towns of Aurora, Whitchurch-Stouffville and Newmarket established a new partnership to support their programs. In 2018 more than 2,500 tonnes of textiles were collected through local municipal programs including donation bins, event days, community garage

Curbside Giveaway Days

Backyard Composter Sales

Good Food Program

Repair Café

sales and education campaigns. As of October 2019 York Region added collection bins at the Community Environmental Centres and Georgina Transfer Station. **Municipal textile programs** are available in eight York Region municipalities.

Since 2014, over 3,500 **backyard composters** were distributed to residents, diverting an estimated 356 tonnes of organics from the curbside.

York Region, Markham Public Library and York Region Makers (NewMakeIt), partnered to launch the first **Lendery** – a library of things such as household items, sporting goods and hand tools. The program reduces waste by allowing residents to borrow infrequently used items instead of purchasing them. A donation drive to build inventory for the Milliken Mills Lendery in the City of Markham allowed people to contribute to the Lendery; residents contributed 98 items to help build this community resource. To date, the Lendery in the City of Markham has 121 active members and 244 items have been borrowed from the Lendery since it launched in July 2019. The most frequently borrowed items include saws, drills and a pressure cooker. A new Lendery recently launched in Newmarket and an additional location is planned for Vaughan in 2020.

In 2017, the Region and NewMakeIt launched the **Repair Café program.** Since then, the Region and NewMakeIt have partnered with local libraries, local cities and towns and community groups to deliver the program and expand the program's reach.

Since 2017, 22 Repair Cafés have been held across the Region. Approximately 800 guests attended those events and nearly 500 household items were fixed or diagnosed at those events. The Region started the Repair Café program with the goal of inspiring community groups to host their own Repair Cafés. In 2019, Markham Public Library, Richmond Hill Public Library, and the Township of King hosted their own Repair Café events with support from the Region.

More than 8,000 students were engaged through 54 presentations on reducing waste and improving reuse and recycling efforts at school and at home.

Multi-residential building managers, superintendents and tenants reduced waste through reuse and recycling initiatives. The Town of Aurora's e-waste and battery collection pilot continued, the City of Richmond Hill updated their development standards and the City of Vaughan expanded collection services to more buildings in 2018.

"...in terms of climate benefits, waste prevention is the best management option."

U.S. Environmental Protection Agency

Waste management metrics back up the success of SM4RT Living. In 2013, the year the plan was developed, each York Region resident generated, on average, almost 330 kilograms of waste. By 2018, the average per resident had dropped to 299 kilograms, a reduction of 10%. With producers becoming responsible for the blue box, this plan moves from targeting total waste per resident to reducing green bin and residual waste, as outlined on page 38.

Through the Regional Official Plan, the Region set a goal of achieving 90% diversion from landfill by 2016, which it achieved. It continues to work toward the goal of diverting all waste from landfill that can feasibly be managed by other means.

While this update continues to take a balanced approach between ensuring the right infrastructure to process waste and encouraging waste reduction, events since 2013 have tilted the balance further towards prevention. This direction is bolstered by both economic analysis and environmental impacts:

- Costs of processing waste are rising. Projections show that meeting SM4RT Living targets for green bin and garbage would result in an estimated $44 million in savings across the Region over the 11 year period from 2020 through 2031.
- Reducing waste tonnage helps reduce greenhouse gas emissions, whether from trucks that pick up at curbside, energy needed to recycle materials or decomposition of residual wastes.

York Region was the first Ontario municipality to recognize the critical importance of waste prevention. Since then more communities, including the City of Toronto and Peel Region, have followed suit, and the Ontario government made it a key element of its new provincial framework for municipalities, as outlined in the Made-in-Ontario Environment Plan released in November 2018.

SM4RT Living has also contributed to a higher rate of waste diversion into recycling, composting and reuse. In 2013, York Region and its local municipal partners diverted 59% of the tonnage picked up at the curb, mainly through the blue box program for recyclables. By 2018, the diversion rate had risen to 68%.

This update continues strong Regional support for diversion, while describing an evolving new provincial framework that makes producers responsible for diverting waste generated by many types of products. The Region and other municipalities have long advocated for this change. As the new provincial framework is rolled out, their focus will be on ensuring a smooth transition and proper producer accountability for existing products, as well as expanding the scope of products to be covered.

NEWMAKEIT: PEOPLE SHARING SKILLS, TOOLS AND KNOWLEDGE

"We're always thinking about what we can do, not just as a physical space but as a community movement," Chair, Board of Directors, Derrol Salmon explains from the midst of the bustling NewMakeIt "makerspace" that he helped create.

Located in the Town of Newmarket – which inspired the organization's name – NewMakeIt is part of an emerging trend toward collective spaces that bring together people, tools, knowledge and skills to build a community focused on fixing, repurposing, creating and innovating. It's currently housed in a town-owned public works storage shed just east of the Town of Newmarket's downtown core.

Salmon and his co-founders had a vision of a makerspace in the Region, but weren't sure how to make it happen. By reaching out to York Region, they learned about – and successfully applied for – a provincial grant to get started.

Beyond provincial and Regional support, the founders recognize that it was really the community that made the idea a reality and helps it thrive. "It's key that it's for the community by the community," Salmon says.

NewMakeIt members share both space and resources, which include sophisticated tools and equipment for creating new products as well as carrying out repairs. Volunteers are available as mentors and to pass along skills. "We want to give (members) a sense that they're not alone in their journey," Salmon explains.

NewMakeIt has partnered with the Region to provide "Repair Cafés," events where anyone can bring in a damaged item and get help fixing it. These events have turned out to be about far more than just preventing waste. Discussing how to repair an item often leads to a conversation about its value to the person who wants to save it from being discarded.

And for volunteers, it's a chance to give back to the community and pass along skills and knowledge that also risk being lost.

The organization also works to engage youth by working with schools, so that they will also be empowered to do things themselves, whether it's repairs or new projects.

Another important aspect of its activities is nurturing start-ups and encouraging entrepreneurs to take a business idea from concept to reality. With the rise in interest in the circular economy, Salmon is looking at developing new programs with that focus. This would tap into NewMakeIt's orientation towards innovation and entrepreneurship, as well as members' interest and experience in reclaiming, repurposing and reusing materials.

METRICS SHOW GROWING SUCCESS

REPAIR café

800 PARTICIPANTS

462 ITEMS FIXED

Good Food
PLAN. PREPARE. ENJOY.

117 GOOD FOOD OUTREACH EVENTS

16,340 PEOPLE ENGAGED

TEXTILES
Clothes, shoes and more!

188 MUNICIPAL COLLECTION BINS

7,983 TONNES OF TEXTILES COLLECTED

CURBSIDE GIVEAWAY
#YRCURBALERT

137 EVENT DAYS

MOST COMMON ITEM: FURNITURE

3,500 COMPOSTERS SOLD

356 TONNES OF ORGANIC WASTE DIVERTED

TRASH BLASTERS!

54 PRESENTATIONS BY LOCAL CITIES AND TOWNS

8,612 STUDENTS ENGAGED

PROMOTION & EDUCATION MATERIALS TO 33,592 UNITS

OVER 20,000 UNITS SERVED WITH 3-STREAM COLLECTION

Provincial and federal governments are acting with impacts on municipalities

Ontario shifts costs and responsibilities from municipalities to producers

The recycling landscape in Ontario is changing in major ways. At present, municipalities are provincially mandated to deliver blue box services and must collect five standard materials including newspapers, glass bottles/jars, steel cans, aluminium cans and bottles made from PET, a type of plastic and at least two other materials such as boxboard, cardboard, fine paper, plastic film or rigid plastic. Municipalities fund 50% of the program costs with producers funding the other half through Stewardship Ontario. Producers are generally defined as companies that design, create, import and/or market consumer products and packaging.

The Ontario Ministry of the Environment, Conservation and Parks is moving ahead with a new provincial framework that makes producers fully responsible for the blue box program. Both operations and costs for blue box materials will start to move from municipalities to producers in January 2023, with all transfers expected to be complete by the end of 2025.

During transition, an important role for the Region will be ensuring that the shift is seamless for residents. The Ministry has said that Ontario residents will experience the same or improved access to blue box services under the new provincial framework and the list of acceptable materials will be consistent across Ontario.

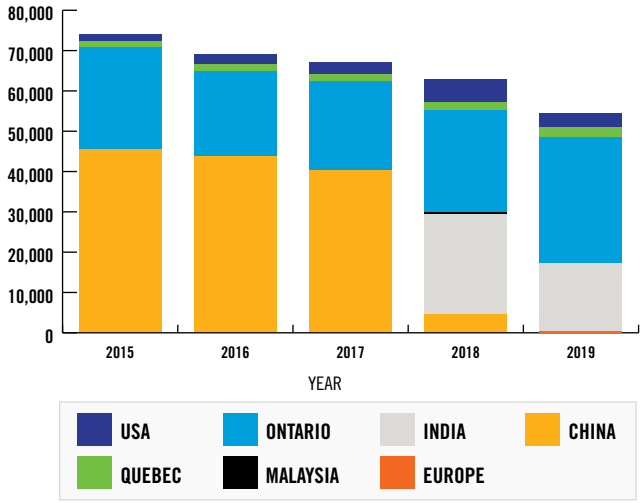
After the transition, municipal roles will change but to what extent it is not yet clear. In many jurisdictions where extended producer responsibility has been adopted, municipalities have remained involved to some degree in collecting and/or processing materials. Often it is more cost-effective, for example, for one truck to pick up the blue box and other waste, so a municipality may contract to be a service provider.

WHAT'S IN THE BLUE BOX AND WHERE IT GOES: BOTH ARE CHANGING

The goal of recycling blue box materials is to save energy and resource extraction costs. Energy savings range from 60% to 95% compared to initial production and some materials like metals and glass can cycle through the system an unlimited number of times.

In recent years, however, changes in both products and end markets have created challenges. Chart 4 shows the decline from 2015 to 2019 in the Region's recyclable tonnage:

Chart 4: All Material Marketed (Tonnes)



The make-up of the blue box is changing. The rise of digital media has reduced newsprint and other fibre. Newer, lighter-weight packaging, often mixing two or more materials such as drink pouches and coffee cups, is displacing glass, metal and heavier plastics. These materials create confusion for residents and challenges for municipal programs. They have no viable end markets and can end up contaminating bales of other materials during sorting.

End markets are shrinking, as well. In 2018, China banned imports of 24 types of recyclable material and introduced stringent new limits on contamination of paper and other fibres. Other end markets raised their standards as markets became flooded. For the Region, this has turned newsprint from a source of revenue to a cost and reducing contamination of all fibre has become a priority.

Under a new provincial framework for the blue box, these concerns should move to producers. Until then, however, the Region must continue to deal with the costs and risks.

The evolving new provincial framework is affecting several products outside the blue box program, including:

- Batteries
- Household hazardous waste
- Used tires
- Waste electronics

Producers of these items are becoming fully responsible for collecting and managing their products and packaging after consumers have finished using them, with the provincial Resource Productivity and Recovery Authority responsible for oversight and enforcement. These items were previously covered by a number of programs with varying forms of oversight.

Used tires were the first material to move to this new model on January 1, 2019. Single-use batteries will follow in July 2020, waste electronics in January 2021 and hazardous or special waste (except single-use batteries) in July 2021.

For the most part, impacts on municipalities from transitioning these materials are less significant than with the blue box transition. These materials make up a relatively small portion of waste and separate programs for them already exist. Municipal collection takes place at depots, not through mixed curbside pickup.

The Region and local municipalities will face decisions, nonetheless, about whether to continue to collect some of these materials at their depots. While drop-off at a depot is often easier for residents and reduces the likelihood of improper disposal, offering depot collection involves municipal costs. For some products, such as tires, numerous other collection points make municipal involvement less important, but in other cases avoiding the risk of improper disposal is likely to warrant continued municipal involvement.

Success of the transition to producer responsibility will depend on how change is implemented. The Region has a number of concerns, including the following:

- Currently there is no province-wide list of materials that will be acceptable in the blue box. If materials accepted in the current blue box program in York Region are not on the new list, they may end up in another waste stream.
- If producers want to continue to use problematic materials, like laminates, they must ensure that there are robust end markets where these can be recycled or reused.
- Costs of managing products not in the blue box program but nonetheless subject to producer responsibility, such as tires and electronics, belong with producers, including any costs incurred by municipalities to ensure their safe collection and disposal.
- An increasing amount of packaging for take-out foods and other products is being labelled as "compostable," but in fact will not decompose under normal processing conditions. This adds to the Region's costs, because the material is managed as residual waste at the processing facility. If producers increase the shift to "compostable" packaging to reduce their blue box tonnage under the new provincial framework, the problem will become much worse. The Region advocates for making producers responsible for these materials, including additional costs municipalities incur to process them.

All of these issues relate to the activities of producers, the mandate of the Resource Productivity and Recovery Authority, which is responsible for oversight, compliance and enforcement of the new provincial framework and the accountability of the Ministry that developed the new provincial framework. During the transition, the Region will advocate strongly for measures that protect municipalities and our taxpayers from risks, costs and responsibilities that properly belong with producers.

In the longer term, its expected is that the new provincial framework for blue box recyclables and other items will provide an incentive for producers to redesign products and packaging to reduce their costs of managing the resulting waste, especially mixed-material packaging. There is also the possibility that producer responsibility will be broadened to cover such materials as carpet, mattresses and construction and demolition materials as has happened in other jurisdictions. These changes could help speed the transition to a more circular economy.

The new provincial framework is part of a broader set of provincial waste management initiatives outlined in its Made-in-Ontario Environment Plan. The provincial plan targets two growing problems that municipalities will continue to face after the blue box transition: food waste, which it commits to address by developing a proposal to ban food waste from landfill; and discarded textiles, on which it will consult with key partners such as municipalities, businesses and the waste industry. The section headed "Growing costs and impacts strengthen the case for preventing waste" at the end of this page discusses impacts on the Region and local municipalities of these and other continuing concerns.

Although municipal responsibility is generally limited to residential waste, the Region and its local municipal partners recognize that extremely low rates of waste diversion from other sources, particularly in the industrial, commercial and institutional sectors, is a significant problem. It urges provincial action on this front so that provincial targets on waste reduction and diversion can be met and residents will no longer be confused and frustrated in their efforts to recycle in their workplace or community as easily as they can at home.

Federal focus on plastics

A focus at the federal government level is the impact of plastic waste, which creates unsightly litter and is increasing environmental concerns. In June 2018, Canada joined more than 20 other countries in adopting the Ocean Plastics Charter, which aims to create "a more resource-efficient and lifecycle approach to plastics stewardship on land and at sea." The initiative also involves more than 60 private-sector partners, including major corporations and industry associations.

The federal government has signalled that it could take further action, including a ban on some single-use plastic items starting in 2021.

See "Use, toss, repeat – or avoid?" starting on page 21 to learn the Regional approach to concerns about single-use plastics and related products.

Growing costs and impacts strengthen the case for preventing waste

Even after the blue box transition, municipalities will remain responsible for about three-quarters of all residential waste. Several factors, outlined below, are pushing up the costs and complexities of managing the remaining waste streams, making the case for waste prevention stronger than ever.

New approach to organics processing should reduce carbon footprint

More than half the food produced in Canada goes uneaten, according to Second Harvest, an agency that works to reduce food waste. Some waste, like vegetable trimmings, is unavoidable, but research has shown that most of the wasted food could have been eaten. In addition to costing the average household roughly $1,500 a year, food waste has a profound impact on municipal costs and the environment.

The municipal green bin program was introduced to keep food and other organic waste out of landfill. Two main types of technology are used to process diverted organic waste:

1. Aerobic Processing

In aerobic processing, organic material decomposes in the presence of oxygen, releasing carbon dioxide and leaving behind a dark, crumbly, soil-like substance that may be directly applied to farm fields. Modern processing typically occurs indoors and process air is treated to reduce odours before release to the environment. To further reduce the potential impact of any odours, facilities are frequently located in sparsely populated areas.

2. Anaerobic digestion

Anaerobic digestion, which excludes oxygen from the decomposition process, takes place in a contained vessel under carefully controlled conditions. It produces biogas, largely made up of methane, that can be harvested for fuel and leaves a mix of solid and liquid material called "digestate" that is rich in nutrients and has value as soil conditioner or fertilizer. Anaerobic digestion has been used in wastewater treatment for many years. Using it to process food waste is relatively new to North America although it has been used for that purpose in Europe for decades.

The Region currently contracts for green bin processing capacity at two aerobic facilities outside the Region. A smaller portion of green bin material is processed anaerobically at facilities that are also outside the Region. Trucking costs are high and the round-trip travel distances range from 260 to more than 900 kilometres.

For several years the Region has considered alternatives that would reduce the carbon footprint of managing green bin materials. Appendix B outlines a recent analysis of the options and concludes that moving to anaerobic processing makes sense. This process yields a biogas that can replace fossil fuels and because of its contained nature facilities could be closer to where organics are collected, reducing the carbon footprint of trucking. It is estimated that switching to anaerobic digestion would reduce the Region's greenhouse gas emissions by roughly 15,000 tonnes a year.

In addition, life-cycle analysis shows that contracting to process the Region's green bin organics at privately owned facilities is likely to cost less than using a Region-owned or other municipally owned facility, while providing the same environmental benefits.

A provincial policy discussion about banning organic waste from landfill has spurred major private-sector interest in developing new anaerobic processing capacity in locations close to and/or within the Region, which would provide a greater selection of facilities while reducing current trucking distances.

Based on these findings, the Region will issue a Request for Proposals, open to owners of both planned and existing facilities, in fourth quarter 2020. The contract term might be as long as 20 years to give bidders greater certainty and would include rigorous, performance-based specifications to ensure that the Region's environmental objectives are met. The earliest contract start date would be June 2022, if sufficient capacity were available by then, while the latest would be June 2024 to ensure continued capacity as existing contracts end.

The later years of the Region's 10-year capital plan include funding for the Region to build its own organics processing facility. If the go-to-market strategy is successful and once the new anaerobic digestion contracts are in place and operating, the need for these funds will be re-evaluated.

> "Global estimates are that nearly half the food produced never gets eaten. As a result, preventing and reducing food waste has become a matter of urgency around the world... Canada risks lagging behind."
>
> National Zero Waste Council,
> A Food Loss and Waste Strategy for Canada

Even with anaerobic processing, however, the green bin will remain the most costly of municipal waste streams to manage, given the almost 100,000 tonnes that require processing annually. By addressing food waste and encouraging on-site processing, for example through backyard composting, this update aims to reduce green bin waste by 15% from 2014 levels by 2031.

Success of those efforts would further support the case for contracting for third-party capacity. Ownership locks in many costs that are fixed even if processing volumes drop, while contracting for capacity can be more flexible.

In 2015, the Region entered into a 10-year agreement with Miller Waste to process leaf and yard waste collected by local municipal partners and at the Region's Georgina Transfer Station, with no annual maximum tonnage specified. The Region completed its last annual inspection in April 2019, and no significant findings or issues were identified.

The contract can be extended by mutual agreement for five years, which would take it to October 2030, after which a further extension might be negotiated. Before the current contract expires, the Region will review and evaluate available options and present a preferred option to Council for approval.

YORK REGION FOOD NETWORK: MORE FOOD LITERACY, LESS WASTE

For York Region Food Network, preventing food waste "is in our DNA," says Kate Greavette, Executive Director.

The charitable organization, headquartered in the Town of Aurora and active across the Region, has as its vision "Food for health – food for all." Through its programs it provides community gardens, cooking, preserving and other food-related workshops, access to community meals, information on food banks and locally grown foods, outreach to schools and other community resources.

To Greavette, food literacy – which can be broadly defined as food-related knowledge, attitudes and hands-on skills – is at the heart of preventing food waste. The Network works to improve literacy by teaching people to cook from scratch, helping them garden and explaining how to compost and why it's important.

"As a core value, we strive to have a positive environmental impact, prioritizing local and sustainably produced foods, regenerative agriculture, plant-based meals and waste-free practices," Greavette explains. "This means composting kitchen waste at on and off-site programs, avoiding single-use plastics as much as possible and holding waste-free events."

The Network's own headquarters feature a backyard composting barrel for food scraps generated in its commercial kitchen, and the community garden has a three-bin composting system. The organization has done workshops on composting including vermiculture (which uses worms to speed the process and can be done indoors), and is happy to lend its vermiculture set-up to schools.

All methods provide a finished product that's invaluable in improving soil texture, ability to retain water, and availability of soil nutrients. Composting also reduces the burden on the green bin waste stream, which is the most costly for the Region to process. While some of the organization's programs, especially those directly supported by York Region, focus on people living with low or moderate income, Greavette notes that a lack of food literacy is not an income issue.

In fact, research suggests that those with lower incomes frequently cook food from scratch (although many cite the challenge of finding affordable healthy ingredients). This may be because higher-income households can more readily afford prepared foods, take-out or meals outside the home, especially when time pressure doesn't allow for home cooking.

Another group that faces challenges is newcomers to Canada – not typically because of a lack of cooking skills, but because in their new environment it may be hard to find familiar food products or understand how to use ones produced here. The network helps with both issues as well as providing guidance on where to find locally grown Asian and South Asian ingredients like bitter melon and eggplant, it welcomes people of all backgrounds to workshops that focus on using local, in-season crops that might be less familiar.

Use, toss, repeat – or avoid?

Single-use items like take-out containers, plastic bags, coffee cups and "flushable" products are a growing problem for waste management, the environment and public spaces. These items often blow out of blue boxes on windy days, are tossed from vehicles, or escape from overly-full waste disposal bins, resulting in unsightly litter and contaminating the natural environment.

The new provincial framework will in theory make producers responsible for single-use products that belong in the blue box, but the transition is unlikely to resolve all concerns.

Many single-use products, like baby wipes, diaper liners and cleaning sheets, are marketed as being disposable with a flush down the toilet. Researchers at Ryerson University recently tested several such items, and found that apart from toilet paper none could be safely handled by plumbing or wastewater systems. Their study joins a growing body of empirical evidence collected by municipal wastewater operators that "flushables" can damage infrastructure and cause back-ups.

These items cannot be processed through the green bin because they typically contain materials that can't be processed as organics. As currently manufactured, they are not recyclable either. This leaves the residual waste stream – the garbage – as the only alternative to flushing. In that stream, however, they pose all the same concerns as other plastic and mixed-material items that can't be recycled.

Increasingly, mindful consumers are moving away from problematic items and materials – whether by saying no to excess packaging at the point of sale, asking quick-service restaurants to provide reusable serving items or seeking alternatives to plastic bags and other single-use items. Many retailers have picked up on those messages and now provide certain items, like straws, only if the consumer asks.

The Region and local municipalities are looking at the most effective ways of accelerating this trend. Through the waste management master plan review, York Regional Council expressed interest in exploring bans, deposit return, take-back and other similar programs.

Appendix C provides more detail on concerns around single-use plastics and litter and outlines research carried out on reduction strategies.

While banning certain items may seem like a solution, experience elsewhere has shown it to be problematic, and in some cases bans have been challenged in court. Working with businesses to encourage less waste, on the other hand, can be beneficial to customers and municipalities, as well as to the businesses themselves by illustrating their concern for the environment.

An "ask-first" approach to single-use items like straws, stir sticks, condiment packets, plastic bags and cutlery aims to cut down consumption by asking customers if they're needed instead of providing them automatically.

Some fast-service restaurants and other outlets have put "ask first" policies in place on a voluntary basis, with one local chain in the state of Oregon reporting a drop of 32,000 straws a month as a result.

A number of municipalities have introduced or are considering bylaws that make the practice mandatory. For example, ask-first bylaws came into effect in Portland, Oregon, and Berkley, California, in 2019. The City of Toronto has proposed similar measures to come into effect starting in 2021.

"Fast fashion" feeds a potential crisis

The fashion industry is now the second-largest contributor to greenhouse gas emissions in the world, second only to the petroleum industry, producing 1.2 billion tonnes a year.

A key problem is that today's clothing system is driven by "fast fashion" that promotes short-term trends and encourages constant purchases of inexpensive clothing items. The average Canadian, for example, buys 68 garments every year. Many of these are quickly discarded, often by being thrown in the garbage. In Ontario alone, an estimated 500 million tonnes of post-consumer textile waste – enough to fill the Rogers Centre three times over – end up in landfill every year, according to the Ontario Textile Diversion Collaborative.

Synthetic fibres like polyester and acrylic are essentially forms of plastic and disintegrate in a similar way, creating particles that will persist for centuries. Like food waste, natural fibres release greenhouse gases as they decompose. Both synthetic and natural fibres do additional harm if the dyes and other chemicals they contain get into soil, water or air.

Reuse avoids these environmental problems and allows textiles to be put to use again. For many charitable organizations, the resale of clothing provides much-needed revenues.

> "We simply buy too much clothing – in fact, 60% more today than we did 20 years ago, and we keep our clothes for half as long."
>
> Ontario Textile Diversion Collaborative, 2019

Many of the actions in the initial SM4RT Living Plan focused on encouraging clothing donations and swaps and textile-related activities will continue in this update.

CORNERSTONE: REUSING OLD TEXTILES TO BUILD NEW LIVES

"It's about becoming part of the community and creating a place where people can feel safe." That's how Controller, Patty Trudel of Cornerstone to Recovery describes the organization's mission. Because the charity, headquartered in the Town of Newmarket, is largely funded by textiles donated within the Region, its work also supports diversion of material that would otherwise go into the waste stream.

Cornerstone's focus is recovery from addiction, including alcoholism and opiate addiction. Through a residential centre that houses up to 10 men and a community centre and wellness facility, it provides counselling and life skills training and employment-readiness programs, including the Regionally-funded STEPS Training and Employment Preparation Program.

Residential centre guests take part in the physical work of harvesting the centre's hay and caring for its flock of chickens, with plans to potentially add a small herd of sheep. At times they also help out with loading or unloading trailers of donated clothes and other textiles. Trudel says that this is all part of a gratitude program that teaches guests the value of work and giving back to community. Cornerstone would like to add a women's residence in future based on the same concept, possibly with a garden its guests could tend.

Cornerstone's activities depend largely on funding received through the sale of textiles that are collected in 80 bins in 68 locations, most of which are in York Region. The organization partners with local municipalities, the Region and other charitable organizations such as Diabetes Canada. Bins are placed in strategic locations, including shopping malls, and provide Cornerstone with roughly 1,000 tonnes of textile materials a year.

After collection from the bins, the textiles are sold to Value Village, a retail chain for previously owned clothing and other items, which buys only from charities. Cornerstone has agreements with two Value Village stores in the Region that promote its bins and their locations.

Higher-density growth makes collection more complex

As the Region's communities welcome new growth over the next decades, the shift towards urbanization and higher population density will continue:

- The opening of an extended subway line to the City of Vaughan has triggered construction of several new high-rise developments.
- The provincial government has announced its support for extending the other arm of the subway through the cities of Vaughan, Markham and Richmond Hill to end near Highway 7 and Yonge Street, which is expected to bring similar development.
- Population density is also rising elsewhere along corridors and in urban centres identified in the Region's Official Plan.
- Seniors are the fastest-growing demographic in the Region's population and many are choosing to downsize into more compact homes, often in multi-residential buildings.

From 2011 to 2019, apartment units were the fastest-growing dwelling type in the Region, increasing by 50.3% to reach a total of 18,990 units. While the increase was below the initial SM4RT Living Plan forecast of 68.4%, it outpaced growth in detached and semi-detached units, which increased by 9.0% and 12.0% respectively over the same period.

Higher-density development unquestionably brings many environmental benefits, most notably by making it easier to reach services by transit or walking. There is also evidence that more densely populated areas generate less waste per household, mainly because living spaces are smaller.

Conversely, however, higher-density development can make it more complicated to deliver services, including waste management. Concerns include limited storage within the household for various waste streams, lack of chutes for recyclables and organics, inconvenient access to recycling bins, insufficient disposal containers, lack of messaging and limited enforcement of recycling requirements.

The Regional Official Plan works to address some of these concerns by requiring all new multi-unit

residential buildings to incorporate the ability to collect three waste streams (garbage, recyclables and organics) and committing to work with local municipalities to require existing multi-unit residential buildings to participate in three-stream waste collection. While this is helpful in new construction, not all existing buildings can be retrofitted to offer chutes for garbage, recyclables and organics.

The initial SM4RT Living Plan also recognized these challenges and included several measures aimed at improving the quantity and quality of materials collected for recycling. The Region is also piloting the potential use of under-sink food waste grinders in multi-residential or high-density settings where it is difficult to collect organics through the green bin program. An academic partner was retained in late 2019 to test the feasibility of this approach and assess overall environmental impacts, including on waste diversion and wastewater, with completion expected in 2021.

In developing this update, the progress on the 2013 SM4RT Living Plan initiatives was assessed and data from waste audits at a range of buildings was analyzed.

The analysis showed that diversion performance can vary significantly from one building to the next, and variations may reflect challenges with capture rate, contamination or both. Design features and set-up of the building, as well as resident behaviour all come into play in the results. Nonetheless, several best practices for the owners/managers of multi-residential buildings emerged. These all support the overarching goal that diversion from waste should be as convenient for residents as garbage disposal:

Partners delivered 33,592 waste education materials to almost 20,000 units.

- Educate new residents about recycling/diversion programs
- Distribute recycling information to each resident
- Ensure recycling information is readily available
- Where feasible, provide a three-chute system
- Provide adequate space for waste recycling/ diversion containers
- Provide in-unit recycling storage containers (bags or small boxes) for each household

Because supportive and engaged building superintendents and owners are key to the success of diversion, a crucial municipal role is training building staff and owners on how to promote and operate programs, and turning them into recycling and reuse champions.

Multi-Residential Diversion/Reduction in York Region is included in this document as Appendix D.

New waste management technologies and approaches are constantly emerging, some of which are much easier to include at the design stage of a building than as a later retrofit. New and Emerging Initiatives and Technologies in Waste Management, which appears as Appendix E to this plan, provides details and pros and cons of several approaches.

With further intensification on the horizon, local cities and towns – especially the three largest cities, in the south – will have greater opportunities to assess and implement new multi-residential solutions.

In particular, new high-density development at the new subway terminus in The City of Markham could provide an opportunity to explore automated waste collection. Using air suction technology waste can be transported through underground pipes from buildings to centralized collection points, cutting down vehicle traffic and space needed for in-building storage.

Sharing lessons learned and embedding standards for waste diversion and material storage and collection in the approval process for new multi-residential developments are key aspects of ensuring greater success.

As the northern municipalities continue to urbanize, with the building of more multi-residential buildings, there is a considerable knowledge base that the three southern cities can share. This should support consistency of approaches, design standards, data collection and sharing, performance measures, enforcement and other issues across the Region which is also an important part of improving outcomes.

Focusing resources on key priorities

Using data to drive improvements and greater efficiency

Data is an essential component of the SM4RT Living Plan. Collecting, analyzing and sharing data is crucial to understanding current conditions, using evidence to support better operating and capital investment decisions and determining if actions are moving the waste management system in the desired direction. Robust evidence also helps to focus advocacy efforts with the federal and provincial governments and shows residents how much waste they produce and how it is being managed.

While the existing system of data collection represents a good start, advances in technology are making it easier and less costly to collect and manage much more information. For example, sensors on vehicles and

collection bins can record the weight of containers and how full they are during pick-ups, the time of pick-ups, location of vehicles and whether drivers are following required operating procedures. In waste processing facilities, information can be collected on vehicles entering the facility, such as plate number and time of entry, and on waste composition through automated sorting mechanisms.

Radio Frequency Identification (RFID) technology is in use for some of these purposes in some of the local municipalities. The Region and local cities and towns have looked at using the technology for measuring waste collection frequency and weights at multi-residential properties, but there appear to be ongoing challenges with existing technologies.

Advances of these types potentially offer an opportunity to rethink how data is managed and success measured, which is in tune with development of a digital strategy for the entire Environmental Services department. The new strategy aims to leverage data to make better decisions in order to use resources more efficiently, drive more effective collaborations and meet rising community expectations.

In the case of waste management, staff have already leveraged cloud-based software to automate creation of several reports, for example monitoring how tonnage moves between waste facilities or how prices for blue box materials are changing. This has reduced the time needed to produce the reports, freeing up staff to identify and respond more strategically to trends and issues. It also reduces the risk of errors and provides data in more user-friendly and accessible ways that can be shared with local municipalities through a secure platform.

The Region and local municipalities will continue to build and apply understanding of how collecting, combining and analyzing data efficiently from all sources can improve seamless operations.

The changing landscape calls for closer coordination

Local city and town staff have deep knowledge of their communities' unique circumstances and attitudes, which is essential to SM4RT Living.

This update has discussed several specific areas where achieving the best outcomes will depend both on that local expertise and on close coordination and collaboration with other municipalities and the Region. These include, for example, taking steps to reduce contamination in blue box materials, helping to ensure a smooth transition to the new producer responsibility framework, addressing single-use items and other problem materials, improving performance in multi-residential buildings and getting maximum value from data collection and analysis.

The initial SM4RT Living Plan created a structure for collaborative decision-making and sharing of ideas and information. The Region and local municipalities have collaborated on several fronts, including advocacy submissions to the provincial government. They also work together through a Strategic Waste Policy Committee and a working group on blue box challenges.

This renewal builds on these collaborations with the aim of bringing greater efficiency and effectiveness to the integrated waste management system.

Ensuring capacity for residual waste

The Region's Official Plan sets the goal of diverting at least 90% of waste from landfill by 2016, which has been achieved. In 2019, 94% of waste was diverted.

Diversion is being achieved in accordance with the "4Rs" waste management hierarchy, which places highest priority on the first three elements (reduction, reuse, and recycling), while making use of recovery of energy only for residual waste, which refers to materials that cannot be managed by other means.

There are four main sources of residual waste:

1. Household garbage picked up by local municipalities from the curb (and in some cases from multi-residential buildings) and delivered to the Region's Material Recovery Facility. This is listed as "Municipal Curbside Collection" in the table below.
2. Waste delivered to public drop-off depots, including Community Environmental Centres and the Georgina Transfer Station, that cannot be recycled or reused. This waste typically contains a high percentage of bulky and/or non-combustible material that is not readily suited to producing energy-from-waste.
3. Non-recyclable materials that are removed from the blue box stream at the Material Recovery Facility.
4. In 2018, this included some baled paper that could not be recycled owing to disruptions in end markets and was used to generate energy, which is included as the fourth line of the table below.

The Region currently manages residual waste through incineration at energy-from-waste facilities or, for items that can't be processed that way, through landfill disposal.

The Residual Waste Processing Plan appears as Appendix F. It indicates that the Region's annual maximum capacity at the three energy-from-waste facilities with which it contracts is 133,000 tonnes. This includes capacity at the Durham York Energy Centre, which it co-owns with the Region of Durham. In addition, it has contracted for a maximum of 70,000 tonnes of annual capacity at two privately owned landfill sites and up to 78,000 tonnes at a site owned by the City of Toronto. The first term of the Durham York operating agreement ends in 2036, while all other contracts expire between 2020 to 2028.

The Durham York facility processes up to 140,000 tonnes of residual waste a year, split between York Region with 30,000 tonnes and Durham Region with 110,000 tonnes. The facility can produce up to about 14 megawatts of electricity for the provincial grid, enough to power 10,000 homes, while recovering recyclable metals from the ash.

York and Durham Regions are applying to allow for processing of up to 160,000 tonnes a year without an increase in the facility's size. This change might allow for an increase in York Region's annual capacity, although it would not increase the guaranteed minimum annual processing rate of 140,000 tonnes.

In developing this update to the SM4RT Living Plan, the Region considered options for securing long-term processing capacity to maintain its goal for diversion from landfill. The Region's contract with Covanta Niagara expires in September 2023, which creates a need for additional capacity in less than four years. Analysis considered timing for expansion of Durham York Energy Centre and securing additional contracted capacity.

2019 York Region Residual Waste Tonnage by Source

Source	Tonnes Collected	Percentage of Total
Municipal Curbside Collection	**101,853**	**67.2%**
Public Drop-Off Depots	**27,291**	**18.0%**
Material Recovery Facility Residue	**18,055**	**11.9%**
Blue box managed through energy-from-waste	**4,311**	**2.8%**
Total	**151,510**	**100.0**

A number of factors influence the timing of the Durham York facility expansion. The approvals process is expected to be a lengthy (8-12 years), requiring approvals under the Environmental Assessment Act and the Environmental Protection Act. Having sufficient tonnage to make the expansion viable is also critical. Energy-from-waste facilities are designed to operate at or near full capacity to maximize electrical generation efficiency. The Durham York facility was designed for future expansion to an annual processing rate of 250,000 to 270,000 tonnes per year. The impact of blue box transition on residual waste tonnages required to support DYEC facility expansion will be assessed over the near to medium term.

The Region will need to secure additional contract capacity to serve as an interim bridge until the Durham York facility expansion can be implemented. Regional analysis in Appendix F concluded that a Request for Proposals should be issued in the fourth quarter of 2020 to secure up to 120,000 tonnes of annual processing capacity at privately owned energy-from-waste facilities (in addition to the Region's minimum 30,000 tonnes of annual capacity at the Durham York facility).

The recommended contract structure is an initial term of 12 years, beginning in September 2023 at the end of an existing contract and ending in January 2036 to coincide with the end of the first term of the Durham York contract. The request for proposals for EFW capacity will be structured with optional term extensions to provide flexibility on the implementation plan and timing for the expanded Durham York facility.

The Region's operating experience has shown, however, that it is advisable to maintain landfill capacity for some residual waste dropped off at depots that cannot readily be converted to energy, plus roughly 10% of the remaining residual waste stream to reflect maintenance outages at energy-from-waste facilities.

Taking these factors into account, a Request for Proposals is recommended to secure up to 40,000 tonnes of landfill capacity to manage non-recyclable materials that are not suitable for recovering energy from waste. The contract would run from June 2025 through January 28, 2046 to align with other contracts.

The updated plan includes a commitment to contract for these residual capacity needs as a priority.

3. Achieving the SM4RT Living future

Tapping into partnerships and engagement

Developing this update served as a reminder of the importance of partnerships in achieving SM4RT Living goals. Ways of adapting and expanding existing initiatives like the Lendery, a library of things were part of the conversation and potential new partnerships around local food and with faith communities were identified.

There is both a need and an opportunity to get the community excited about SM4RT Living. Throughout the engagements undertaken during the review and update, people showed an eagerness to learn how to be more mindful consumers and better stewards of the earth, whether by repurposing household items as toys, "shopping at home" to rediscover and renew old clothing or taking up backyard composting. There was a hunger to have more systems in place to expand these choices – like places to make new toys out of broken ones or new clothing from old.

The updated plan focuses on ways to leverage that eagerness. This needs to involve not just the Region and the local cities and towns, but especially community partners. The updated plan therefore proposes a fund and other measures to help support community partners. The Region will also work on innovative and unique ways to spark thoughtful conversations around waste.

> "Besides preventing waste, the most important outcome is the mentality shift that opening a device and attempting to fix it can bring."
>
> Janet Gunter, co-founder of the U.K. Restart Project, quoted in The Guardian, 2013

Community-based research

In developing the update, research into how best to engage people in the community resulted in several key learnings for SM4RT Living:

- People want to reduce waste, but other goals, like more family time, reducing costs and finding more social connections are also important. Events and ideas that combine several goals will be more successful than those that focus on waste management alone.
- People want to get involved in projects not just to meet their needs, but also to learn something new. This gives them a sense of ownership.
- People will try something new if everyone is in the same boat and there is no "expert" in charge. In this situation, initial awkwardness quickly segues into a buzz of collaboration and new ideas.
- Although many residents' lives are busy and full, others lack social connections. People need ways and means to get to know each other.
- With the right environment and tools, people from all disciplines can co-create dynamic new ideas that tackle significant issues in as little as two hours and feel a real desire to act on them.

While there are significant accomplishments to leverage and new opportunities to cultivate, there are also challenges that need to be addressed.

First, the kind of change that SM4RT Living is focused on is often difficult to achieve and it can be hard to tell how quickly, if at all, it is happening. Many people know intellectually that waste prevention is critical to the health of their children and their children's children, but it is all too easy to feel overwhelmed or helpless. People's lives are busy and complex with many demands on their time and attention and even getting their attention – let alone a commitment to act – is difficult.

In addition, media claims about the value of recycling programs have led to a degree of public skepticism. The evidence, however, shows that there is value in recycling. Recycling aluminum cans saves 95% of the energy needed to make new ones. For steel and tin cans, the figure is 60 to 74%; for paper it is about 60%. Recycling plastic saves about one-third of the energy compared to making products from virgin materials.

In most cases, as well, materials can cycle through the production system numerous times.

Another challenge is how deeply consumer patterns are embedded in modern lifestyles. It was suggested through the community engagements that over-consumption may be driven to some extent by a lack of deeper meaning in people's lives or as a way of combatting social isolation or stress. It may also reflect marketers' skill at tapping into a deep-seated human desire to be associated with items that are novel or unique.

While consumerism plays a role in generating waste, traditional waste education will not be effective in addressing it, especially if it comes with a message of guilt. This plan focuses on novel ways of communicating with residents to open their minds to new possibilities. For example, the Fashion Shop presented new shopping options that were trendy and fun, and the Music Shop presented new knowledge around up-cycling and giving existing belongings new life by "shopping at home."

> "Whether we buy them, own them, or order them in restaurants, we want to be associated with unique things .... We desire to feel special and different from others. ... much of marketing activity revolves around [this] need."
>
> Marketing professor Utpal Dholakia, writing in Psychology Today magazine, 2018

ENGAGING THROUGH MUSIC, FASHION AND A 'JAM SESSION'

Dressing up as a musical era, explaining how to turn a T-shirt into a bracelet, bringing together seniors with at-risk youth to make strawberry jam: these aren't the traditional ways that municipal staff engage with residents.

But a shift in waste management – from just picking up waste at the curb to reducing what's put out for collection – calls for strategic and innovative ways of connecting with residents, building their input into decisions and getting them to think differently.

In developing this update, the Region carried out three events with those aims:

- The Music Shop, at the Markham Music Festival in June 2019, was designed to inspire people to re-think how to entertain their children (and themselves). Families were invited into a fun and colourful York Region tent decorated with fabrics and pillows. Once inside, they created musical instruments from common household items and then played them together. Staff – who dressed to match their own favourite musical period – engaged with visitors about what they had repurposed and why it was important to them. The event inspired the notion of "shopping at home" and provided a take-away on how to make instruments from recycled materials.
- The Fashion Shop, at a soccer field hosting a Richmond Hill Moonlight Movie in August 2019, provided a pop-up venue displaying beautiful fashion pieces, including zero-waste items made from scrap material. The purpose was to get two-way conversations going about consumption and fashion. Each visitor could pick a "trend card" hanging from a display tree and their responses showed strong community openness to trends such as on-line clothing swaps, malls selling only recycled items and ways to create new fashion items from existing pieces. The event also offered the chance to repurpose T shirts into bracelets or bags.
- The Jam Session, at a Richmond Hill community hub in September 2019, deepened the Region's understanding of the diversity of its communities. The event was hosted by 360°kids, a youth-focused community organization that operates a centre in the facility. It brought together young people from their Every Bite Matters program, which provides preparation for culinary jobs and seniors living in the complex and got them making strawberry jam together. This very hands-on engagement opened the way to meaningful conversations around food, waste and renewal.

All three events were designed to gather input and clarify information in ways that reach deeper and are more nuanced than polling or surveys. Participants indicated that they valued the chance to have a meaningful conversation instead of just providing survey data.

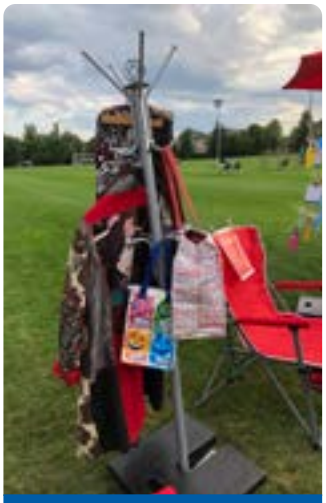
By going to community spaces to reach out directly to residents, using a "customer-first" and inclusive approach and telling the SM4RT Living story in a meaningful and transparent way, innovative engagements like these:

- Give the Region insights into residents' concerns and needs
- Foster better understanding among residents around their role in preventing and managing waste and their ability to make change happen
- Help build support and trust for SM4RT Living

These engagements depend on a process that seeks input from participants in designing how they participate, provides the information they need to participate in a meaningful way and includes the promise that stakeholder contributions will influence decisions.

Ultimately, the goals of engagement are developing knowledge that will improve decision-making and communicating back to participants on how their input affected decisions. This provides a new model for engagement in the updated SM4RT Living Plan.

Music Shop



Fashion Shop

Jam Session

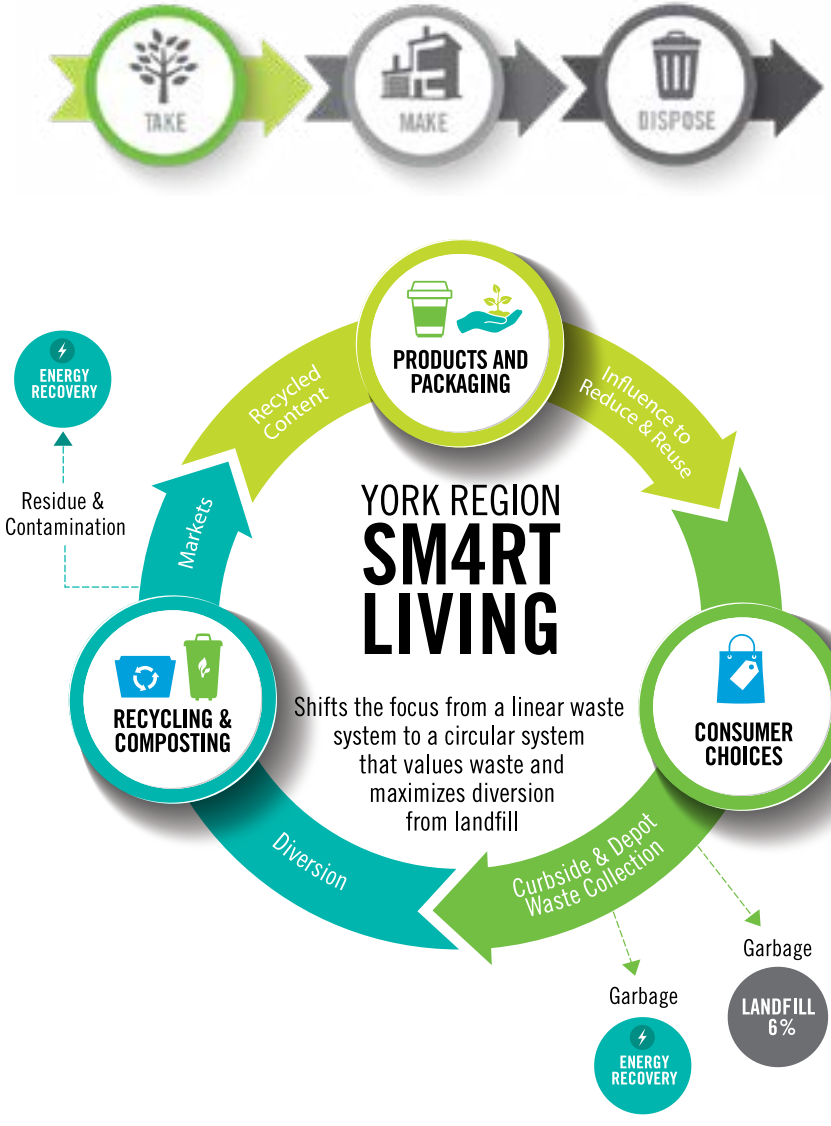
Towards a circular economy

Increasingly, waste is seen as the final stage of a centuries-old linear industrial process in which resources are extracted, processed into products, distributed to end users and then discarded – a process that is ultimately unsustainable.

This has led to a focus on what is called the "circular economy," where resources are continuously recaptured and reused.

At its most basic, a circular economy can be defined as lengthening product life, including making a product easier to repair. It also leverages the idea that reuse, refurbishment and reconfiguration give a product more than one life as it cycles continuously through the economy. The objective of a circular economy is therefore to maximize value at each point in a product's life. Appendix G, Initiating a Circular Economy, provides additional details.

A circular economy also seeks to turn outputs from one process into inputs for another and, in doing so, reduce the consumption of virgin materials and the generation of waste. Recycling materials from a product is seen as a less valuable activity, because of the related energy needs and distances materials often travel to be processed.



CIRCULAR ECONOMY EXAMPLES

Rent frock Repeat is a Toronto-based all-occasion clothing rental subscription service that grew from a special event dress-rental business. Subscribers anywhere in Canada create an on-line style profile and every month receive clothing items that can be worn unlimited times during the month, with items they want to keep available to buy at a discounted rate. Items are swapped out monthly or, depending on the subscriber's plan, mid-way through the month. The inaugural 500 spots were subscribed almost immediately after the service was launched.

Wonderwear, based in the City of Vaughan, is a weekly service that delivers clean cloth diapers and picks up soiled ones. Unlike traditional flat cloth diapers, its products are contoured, sized to age and provided with snaps for speedier changes. The brand's website notes that an estimated 95% of parents in Canada buy only disposable diapers, resulting in the discarding of 1.7 billion disposable diapers each year.

Redefined Finds is a retail store in the Town of Whitchurch-Stouffville offering a regularly changing gallery of restored furniture pieces that have been "upcycled" using the store's sustainable line of paints. It also offers workshops and studio space where customers can work on their own small pieces of furniture using the store's brushes and stencils and guidance from its staff.

Nature's Emporium, a region-based chain of natural food stores, sells many products in bulk and allows containers to be refilled. All of the products sold by Zero Waste Bulk, a retailer in Waterloo, are in bulk or unpackaged. They include food staples as well as toiletries and cleaning products. The Bare Market in Toronto offers a range of goods, including toiletries, containers and do-it-yourself ingredients, in bulk or without packaging.

Foodsmiths, a retail store in Perth, Ontario, sells items from bins as well as "fill stations" that allow customers to refill containers with products ranging from olive oil to laundry detergent.

Algramo, a Chilean company with a social and environmental mission, grew out of the experience of its founder, who found as a university student that buying products in small packages at local stores, as people in the developing world must often do, raises the price and results in plastic packaging waste and litter. He stresses that "we want to show that sustainability … must be for everyone." The company has installed bulk product vending machines in more than 2,300 shops where customers refill containers with everything from lentils to shampoo. The base price is about 30% less than for prepackaged goods, and a code on the reusable container gives an additional discount on future purchases. Algramo has recently taken the concept one step further with the trial of a travelling mobile unit.

ChopValue, a Vancouver-based company, collects used bamboo chopsticks from local restaurants and turns them into home decor, household items and furniture. Started in 2016 by a doctoral student at the University of British Columbia, the company currently collects 350,000 chopsticks a week from about 300 sources in the Vancouver area and has expanded to Victoria, Montreal and Los Angeles. Its products are estimated to have diverted more than three million chopsticks from the waste stream.

Lunapads International is a women-owned, social-mission-driven business based in Vancouver that offers a range of products to replace disposable menstrual pads and tampons. Lunapads helps customers divert 20 million pads and tampons from the North American waste stream every year. Similarly, Divacup, based in Kitchener, offers a silicon cup that replaces disposable products. Since its founding by a mother and daughter in 2003, the company has expanded into 22 countries world-wide.

Several major chains in Canada are adopting practices to encourage sustainability. Bulk Barn allows customers to bring refillable containers to their stores. A&W uses non-disposable mugs, plates, cutlery and other serving items for in-store customers and was the first quick-service restaurant chain to join the National Zero Waste Council. Recipes Unlimited, which owns such chains as Swiss Chalet, Harvey's and East Side Mario's, has phased out plastic straws. Starbucks has redesigned the lids of its cups to eliminate the need for a straw. Sobey's removed plastic bags from its stores in early 2020. H&M allows the drop-off of used clothing (of any brand) at its stores and in return provides a discount card on the next purchase. Montreal-based Lole has a similar program for coats.

Gerrard Street Headphones, a start-up based in the Netherlands, illustrates two key building blocks of the circular economy. Their products are easy to take part to repair or upgrade because the design is modular, components are durable and standardised, and no glue is used. As well, the company offers headphones as a subscription rather than a purchase. Included in the monthly fee is a guarantee that if the product is damaged or an upgrade is available, the customer can return the old headphones for a replacement.

Rock Rose, a Scottish distillery is introducing a fully recyclable pouch for its premium gin. The brand is known for its collectable hand-signed ceramic bottles, and with the new pouch consumers are encouraged to keep the bottle and refill it. The pouch weighs 65 grams compared to 700 grams for a bottle, has been designed to be mailable, and offers significant savings over the cost of a new ceramic bottle. Empty pouches can be returned postage-paid to the distiller for recycling.

> "... solutions for dealing with trash – how to minimize it and how to use it – are driving innovation and the development of new products and materials."
>
> Natalie Atkinson, The Globe and Mail

The Ellen MacArthur Foundation, which focuses on sustainability initiatives, says the circular economy is based on three principles:

- Design out waste and pollution
- Keep products and materials in use
- Regenerate natural systems

While the concept of the circular economy has been around for several decades, a confluence of factors is now driving greater interest:

- Global demand for consumer goods is growing. The Brookings Institute estimates that by 2030, the global middle class will reach 5.3 billion people, almost double the level fifteen years earlier. This will drive much greater demand for consumer goods as well as food, water and energy.
- Supply constraints are likely. Most easily reached reserves of non-renewable resources have already been extracted and finding new sources is increasingly costly and risky.
- Consumer attitudes are changing. Many consumers, especially millennials (those born between 1981 and 1996), want to reduce environmental impacts of products and services they use. Younger consumers are also open to having access to services, not necessarily owning the asset that provides them.
- New technology is enabling the circular economy. More sophisticated ways of collecting and using data – whether on manufacturing processes, city planning, municipal services or consumption patterns – are helping to reduce waste, plan cities that use fewer resources and offer products and services more closely tailored to consumer needs.

Moving to a circular economy will shift the way the economy and companies within it operate. Design of products, sourcing of materials, product distribution and post-consumer service will all change profoundly. Collaboration along the entire supply chain is essential.

Employment patterns will change too with a greater focus on working with existing products and materials as opposed to extracting resources to create new ones. It is expected that the shift will create jobs in what is called the "inner circle" of the new economic model – repairing, reconfiguring and refurbishing products. Unlike most traditional resource-extraction jobs, these can be located near where products are used.

The circular economy is closely tied to a low-carbon future. It avoids the huge energy costs of extracting raw materials and transporting them to factories, consumers and, ultimately, landfill or other residual disposal. It values inputs like wood and other biomaterials that absorb and store carbon dioxide as they grow and can be easily repurposed. Where possible, energy used in industrial processes comes from renewable sources. For all these reasons, many see the circular economy as an important mechanism for achieving global climate targets.

At the individual and household level, moving to a circular economy may result in numerous benefits including healthier building materials, less air and water pollution from resource extraction and less waste from packaging and products.

What the circular economy will look like in York Region, how it will affect economic activity at every scale, how it intersects with extended producer responsibility and what it will mean for municipal waste management are all important questions that the Region and its partners will address as a priority in the early years of this plan. The answers will help to shape actions to put the Region on the course to a circular economy future that aligns with its needs and characteristics.

What's the difference between buying a service and buying a product... and why does it matter for the circular economy?

One of the biggest contributors to waste, experts say, is that most assets aren't used very productively because they are often idle. For example, a typical family car provides only about 5 to 8% of its potential service because it's sitting in the driveway or a parking lot most of the time.

Younger consumers are increasingly aware of the financial costs and environmental impacts of owning a little-used asset compared to buying the service it provides. Ride-sharing, vacation house rentals and even clothing subscription services are burgeoning businesses that target that demographic.

CIRCULAR ECONOMY - WHAT MUNICIPAL GOVERNMENTS ARE DOING

The City of Guelph and surrounding County of Wellington successfully applied for a Smart Cities grant to help fund an ambitious "50x50x50 by 2025 project" to create Canada's first circular food economy. The goals are to increase access to affordable, nutritious food by 50%, create 50 new circular businesses and collaborations and increase circular economic revenues by 50% by recognizing the value of "waste." The initiative plans to leverage local expertise, big data and cutting-edge technology – and reach all its goals by 2025.

The City of Toronto was a finalist and the only city to reach the runner-up level in the 2019 Circular Awards, sponsored by The Circulars, an initiative of the World Economic Forum and the Forum of Young Global Leaders. It aims to become the first municipality in Ontario with a circular economy. Its solid waste management department piloted an artist-in-residency as an innovative way of engaging residents. A new procurement framework is designed to leverage the city's purchasing power to drive waste reduction, economic growth and social prosperity through a circular economy approach.

New York City joined forces with the Ellen MacArthur Foundation, fashion brands, collectors, recyclers and resale companies in a campaign encouraging New Yorkers to keep clothes out of landfills. The Department of Sanitation created an online interactive map showing over 1,100 collection points across the city, allowing New Yorkers to easily find their local drop-off point. The campaign was successful in raising awareness about existing clothing collection infrastructure: compared to the same time period in 2018, collection volumes increased by 583 tonnes across a number of city collection points.

Belo Horizonte, Brazil's third largest city, had a challenge with electronic waste generation, youth unemployment and digital exclusion that put low-income communities at a disadvantage. To tackle all three problems, the government established a computer reconditioning centre where citizens from low-income communities receive extensive training to restore equipment. The refurbished equipment goes on to support over 300 "digital inclusion sites" where local residents have free access to computers and the internet as well as varied training opportunities in basic digital literacy. Since its launch in 2008, the program has restored 7,000 products, diverted 165,000 kilograms from landfill and helped Belo Horizonte earn the title of Brazil's most digitally advanced city in 2011.

The City of Venlo in the Netherlands decided in 2007 that all new city buildings would be designed using "cradle to cradle" principles. Cradle to cradle design makes it possible to recoup some of the original capital investment, as materials can be disassembled and sold back to manufacturers. In designing Venlo City Hall along those lines, careful attention was paid to material choices and energy-saving technologies. The new city hall has played a key role in updating the City's image. Traditionally associated with agriculture and logistics, Venlo is now increasingly linked with innovation and circular economy opportunities that are attracting both businesses and skills.

The London, England, Waste and Recycling Board created the Advance London program to support local small and medium enterprises. The program offers support tailored to companies' individual activities and includes exploring new circular economy markets, revenue streams and business models. By the end of 2018, Advance London had helped 112 companies with tailored advice and held a range of brokerage events and training workshops. One in three companies secured grant, equity or loan funding within 18 months of first receiving advice. The program also helped to facilitate 20 product-market collaborations which by the end of 2018 had generated five new circular products or services.

The City of Vancouver's Economic Commission is supporting circular economy initiatives in central industrial areas. In one area known as the Flats, it is advancing cradle to cradle design by connecting local leaders to their peers, both locally and internationally, to share ideas, build capacity, and innovate; enabling the transition by removing barriers, like lack of space and knowledge, to the deconstruction and reuse of materials; and identifying policies that can help spur the shift to a more circular economy.

Circular Glasgow is an initiative of the Glasgow, Scotland, Chamber of Commerce. Building on Glasgow's role in ushering in the industrial revolution, the initiative aims to make the City a leader in the new circular economy. A tailored program of support is designed to help Glasgow businesses measure their current levels of circular activity and inspire them to consider and implement circular ideas. The Glasgow initiative aligns with the goals of Zero Waste Scotland, which aims to make the entire country's economy circular.

The City of Copenhagen, Denmark, is home to a new energy-from-waste plant that was designed to include a park and ski slope. Its architect, Bjarke Ingels, says that the building reflects the Danes' love of design that combines enjoyment with utility – or what he calls "hedonistic sustainability."

> "[The circular economy] is not just about recycling. Recycling is the least value-capturing loop ...."
>
> Eric Hannon, partner, McKinsey & Company

4. Building on success: The updated master plan

VISIONARY GOAL:

A world in which nothing goes to waste.

MISSION:

The local municipalities and the Region lead the way through partnering, innovating and inspiring change.

The SM4RT Living Plan: Objectives and Actions

Objective 1	2020	2021	2022	2023	2024
Successfully navigate legislative changes This is about responding flexibly and using legislative changes to continually improve SM4RT Living.	Region and local municipalities leverage existing framework for collaborative decision-making to navigate legislative changes				
	Region and local municipalities ensure compliance with changing legislation (e.g., Food and Organics Waste Policy Statement and Resource Recovery and Circular Economy Act), including reviewing Official Plan and bylaws				
	Local municipalities and Region together explore legal mechanisms to ensure producers manage their waste as required in the Region				
	During the transition to full producer responsibility, Region and local municipal partners continue to monitor and address blue box contamination and Region ensures the Materials Recovery Facility performs as needed				
Objective 2	**2020**	**2021**	**2022**	**2023**	**2024**
Use resources and infrastructure more strategically to achieve SM4RT Living This is about focusing efforts, innovating and improving coordination to create a more seamless, cost-effective system and do more with available resources	The Region and local municipalities leverage technology to improve data collection, analysis and information sharing from facilities and operations, in support of greater efficiency and more strategic decisions				
	Region and local municipalities maintain leadership in waste diversion by researching and sharing best practices, approaches and technologies, particularly for multi-residential buildings		Local municipalities take the lead in testing and applying new approaches and sharing lessons learned		
	Local municipalities include standards for waste diversion and material storage and collection in the approval process for new multi-residential developments				
	The Region contracts for anaerobic processing capacity to diversify its portfolio and inform future investment decisions				
	Region and local municipalities work towards consistent messaging and education to reduce food waste, including promoting backyard composting to help manage SSO pressures and costs				
	Local municipalities and Region apply best practices and tools to work towards consistency in waste collection services, messaging, enforcement and performance monitoring				
	Region works with other Ontario municipalities to standardize record-keeping and data reporting across the province to provide consistent evidence for advocacy positions				
	Region secures long-term contracts to recover energy from residual materials				
Objective 3	**2020**	**2021**	**2022**	**2023**	**2024**
Inspire people across the Region to embrace SM4RT Living and advance the circular economy This is about the value of partners and pioneers in igniting the uptake of SM4RT Living and the circular economy across our communities	Region and local municipalities celebrate and encourage grassroots community initiatives that align with the SM4RT Living philosophy				
	Region improves support for partnerships, including establishing a $100,000 Circular Economy grant program that would help community partners, new social enterprises and businesses advance SM4RT Living Plan goals				
	Region identifies and promotes how SM4RT Living connects to broader Regional initiatives around healthy communities and social well-being and builds linkages where appropriate				
	Through strategic partnerships, the Region and local municipalities support opportunities for residents to repair, share, reuse and repurpose items				
	Region and local municipalities work to implement an "Ask First" voluntary program across the Region to reduce single-use items, and show leadership by reducing consumption at their own facilities		Region and local municipalities assess results of "Ask First" program, review federal and provincial policies if available, and determine if a mandatory approach is needed		
	Region and local municipalities advocate for provincial and/or federal policies and legislation that advance the circular economy				
	Region researches, consults and shares findings to build understanding of the circular economy in York Region and how it connects to SM4RT Living		Region encourages residents, not-for-profit groups, businesses and others in York Region to move to the circular economy		

5. Measuring and reporting

Measuring progress and using results to drive better outcomes are essential for continuous improvement.

The Region currently provides two reports on waste management performance:

The Balanced Scorecard, which reports on progress on the SM4RT Living Plan, is submitted to York Regional Council each year. The scorecard includes metrics on key elements of the waste management system, including waste generation rate, pilot program tracking, and outreach efforts. It summarizes progress toward the goals set by the Region and local municipalities, including the 2031 goal of reducing waste generation to 289 kilograms per capita. It also compares waste generation by type (blue box, household organics, leaf and yard waste and other recyclables, as well as residual waste) by local municipality.

The Annual Solid Waste Diversion Report is required as a condition of the Durham York Energy Centre's Environmental Compliance Approval. It provides York Regional Council and the Ministry of the Environment, Conservation and Parks with information about the amount of overall material collected and processed. It reports on household hazardous waste, electronic equipment and all other diversion programs, including results from the Region's Community Environmental Centres. The report also includes information about promotion and education efforts.

In preparing the updated SM4RT Living Plan, the Region and its partners looked at current targets, data tracking and reporting systems and approaches, as well as the evolving landscape for waste management.

The Data Measurement Report, which is included as Appendix H, concluded that with the move to producer responsibility for the blue box program, the focus of reporting should shift towards the two key streams – green bin (organics) and residual waste – that will remain as mandated municipal responsibilities.

- For the green bin, the proposed new target is 71 kilograms per resident by 2031, down 15% from the baseline of 84 kilograms in 2014.
- For curbside residual waste, defined as materials outside the blue box or green bin, the proposed new target is 66 kilograms per resident by 2031, which would be a 20% reduction from the baseline of 82 kilograms in 2014.

These targets are closely aligned with the actions in this updated plan, which will make it much easier to connect trends in garbage and green bin materials to the action plan. While the focus of reporting will shift to these two key indicators, the Region and its local municipal partners will continue to prepare and use additional metrics. An important effort going forward will be to refine the data underlying these metrics to support their use in improving performance.

Review of current reporting suggested a need for more context around the different circumstances of each local municipality and how these affect performance. As a result, reporting will group local municipal partners by population density and provide separate analyses of each city and town. This information will be included in future annual reporting.

The Balanced Scorecard, which reports on progress on the SM4RT Living Plan and the Annual Solid Waste Diversion Report including tonnage reporting will become one combined report as of 2020.

The review also suggested that climate change impacts and the role of waste in producing greenhouse gases warranted more attention in reporting. The Region will report annually on greenhouse gas emissions and recycling efficiency. Measures of financial efficiency, which help to ensure the best use of resources, will also appear every year.

The provincial Resource Productivity and Recovery Authority will be responsible for tracking and reporting on producers' performance on blue box and other recycling programs. Municipalities undoubtedly will use this information to assess how effective the new provincial framework is, and whether improvements are needed.

The review concluded that reports should be aimed at their main target audiences of Regional and local councils and residents, as well as community partners and the federal and provincial governments.

6. Staying flexible and sparking change

This update represents a refinement of the initial SM4RT Living Plan to focus in on achieving progress with the available resources and doing more with less. It recognizes that many parts of the current landscape for waste management are in flux, driven by new and emerging legislation and regulations, rising resident expectations, growing climate concerns and changing markets around the world for recyclables and waste.

As the updated plan is implemented, the Region and its partners will use adaptive management to maintain focus on achieving progress. They will monitor results, constantly scan the environment for changes and seek to understand the full trajectory of trends. These activities will fine-tune the plan and its implementation as circumstances dictate so that efforts continue to be cost-effective.

Where legislation is concerned, directions in this plan have been based on assessing both the probability of a change and the impact the change would have. Fortunately, because the Region and local cities and towns are already leaders in waste management, impacts in most cases are not expected to be major. For example, the Region and its partners have already undertaken many activities prescribed in the recently released provincial Food and Organic Waste Policy Statement. Nonetheless, legislative requirements provide an opportunity to assess current policies and practices and look for opportunities to improve SM4RT Living.

Growth and demographic change have given rise to significant differences across and within the nine local cities and towns and will continue to do so: new technological thinkers alongside traditionalists, communities that mix families and retirees, high-energy urban attitudes in the midst of laid-back rural living. These contrasts and the different ways municipalities are dealing with growth (and growth in waste) underline the divergences that implementation of the SM4RT Living Plan must take into account.

"You might think, 'It's too big!' 'It's too scary!' 'It's too late!' Not true. Small changes lead to big changes, and the more people make them, the greater the impact."

In its "100% green issue" in April 2019, Chatelaine magazine quoted a Canadian psychologist Nancy Prober, who advises that the best way to treat "eco-anxiety" is to take action. The magazine listed several options to reduce individual impacts on the climate. Ranking high are reducing food waste, shopping smarter, and recycling better – all elements of SM4RT Living.

Yet in talking with the local municipalities and others, there were two clear factors that most Regional residents appear to have in common: commitment to family and love of nature and the environment. By tapping into these characteristics, which cut across demographic factors, the Region and its partners can make the undeniable case for change in waste generation and empower people to make it happen.

This will be achieved most effectively through forms of social engagement that are novel, get people thinking in new ways and inspire them to act. Some examples are outlined in the sidebar on page 30.

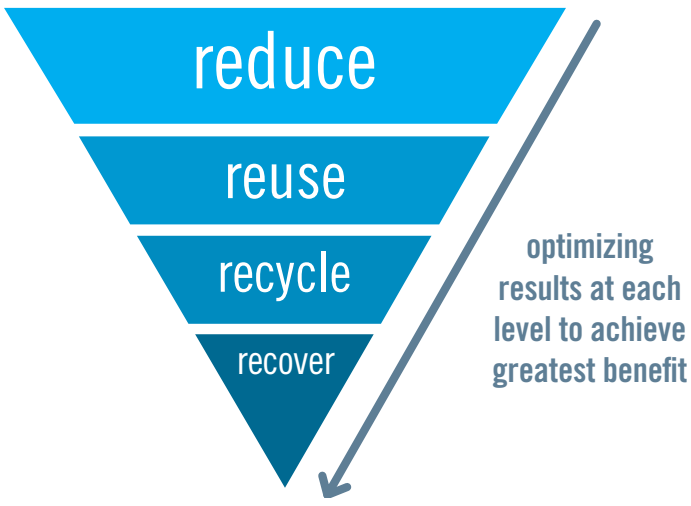
7. Conclusion

Waste is a complex topic, one that is tied to resource extraction, manufacturing and agricultural processes, consumption patterns and decisions about when something is no longer wanted or needed and what happens to it then. Waste management has traditionally started at the "what happens to it then" stage, but it is increasingly concerning itself with all the earlier steps.

In many ways, this evolution parallels the One Water initiative that York Region is pioneering in the water and wastewater sector. Growing from recognition that the world's water resources are finite, One Water builds on efforts to reduce water use and seeks to make the best possible use of every source of water, including reuse, to reduce the burden on the natural environment and the Region's processing infrastructure.

SM4RT Living reflects exactly the same recognition that there are limits to the resources that go into producing the plastic bags, electronic equipment, clothing and other products that are proliferating around the world and that disposing of them involves environmental, financial and even social costs that are not sustainable.

While this updated plan does deal with the need to continue processing the waste that is left after reuse, organics processing and recycling, it also looks to – and encourages – a different future, one in which the full value of resources is understood and protected in an economy of constant renewal.




IT STARTS WITH YOU
AND YOUR COMMUNITY
AND THE ASPIRATION
TO BE PART OF A SOLUTION FOR
CHANGE

Waste Management
17250 Yonge Street, Newmarket ON L3Y 6Z1
1-866-665-6752
york.ca/waste

03 2020

Appendix A Summary: Partnerships and Engagement: From Waste to Well-being

Purpose:

- Conduct engagement and research with residents, community and municipal partners to understand important issues influencing consumer and lifestyle choices
- Explore and recommend novel approaches to inspiring the change needed to reach the goal set out by the SM4RT Living Plan
- Gather insights on successes and challenges from the first five years and build York Region's capacity to support future work

Key Findings:

Research into how best to engage people in the community resulted in several key learnings for SM4RT Living:

- People want to reduce waste, but other goals, like more family time, reducing costs, and finding more social connections, are also important. Events and ideas that combine several goals will be more successful than those that focus on waste management alone.
- People want to get involved in projects not just to meet their needs, but also to learn something new. This gives them a sense of ownership.
- Although many residents' lives are busy and full, others lack social connections. People need ways and means to get to know each other.
- With the right environment and tools, people from all disciplines can co-create dynamic new ideas that tackle significant issues in as little as two hours, and feel a real desire to act on them.
- The Region can strengthen partnerships and drive greater innovation with a mentorship approach that supports and learns from partners rather than taking a leadership role

Recommended Actions:

1. **Innovative research and engagement:** Incorporate ideas from waste and wellbeing into creative engagements that can be used to share the concepts of SM4RT Living and the connection to broader social issues
2. **Stakeholder Advisory Group:** The Stakeholder Advisory Committee that participated in shaping the SM4RT Living Plan provided a diversity of perspectives and expertise to the plan. The review and update identified opportunities to re-establish that group as a vehicle to support implementation in the community.
3. **Strong partnerships:** The Review and Update identified the need to broaden and deepen the range of partnerships supporting the plan. Shifting the Region's role from leading partner into mentoring, facilitating and supporting other groups to develop and delivery projects aligned with SM4RT Living as well as their own priorities is recommended. Internal processes and staff skill development should be aligned to support this shift.

Link to Objectives:

- **Objective 3:** Inspire people across the Region to embrace SM4RT Living and advance the circular economy.

Appendix B Summary: Long Term Source Separated Organic Waste Processing Plan

Purpose:

- This Processing Plan has been prepared to ensure that processing services for source separated organic waste (SSO) can continue to be provided to York Region's residents in a cost effective and environmentally sustainable way for the next 25 years.
- Builds on a Feasibility Study conducted through consultant services by Region staff that evaluated several processing methods for SSO and determined that anaerobic digestion (AD) was the preferred technology option for the Region's feedstock.
- This Processing Plan considers various methods of implementing CH2M Hill's recommendations and identifies a preferred methodology to deliver AD processing services.

Key Findings:

- Eight analysis scenarios were used to assess alternate strategies for transitioning from the Region's current aerobic composting contracts to a long term solution using AD technology.
- Total lifecycle costs, GHG emissions, and other performance metrics were calculated for each scenario over a 20 year operating period from 2026 through 2045 to quantify the effects of key decisions such as contracted service delivery versus Regional ownership, facility location, facility size, and timing of phased construction.
- Study concludes that procurement of long-term contracts with privately owned AD facilities provides the highest overall value to the Region.

Recommended Actions:

- It is recommended that the Region issue a request for proposals (RFP) in 2020 to secure contracted AD processing capacity for all of the Region's SSO no later than 2024.

Link to Objectives:

- **Objective 2:** The Region contracts for anaerobic processing capacity to diversify its portfolio and inform future investment decisions.

Appendix C Summary: Single-Use Plastics and Litter Reduction Strategies Report

Purpose:

- Review relevant government and industry responses to single-use plastics and litter.
- Summarize and identify the problem, approaches to managing single-use plastics and litter.
- Make recommendations for how York Region can better measure and report on progress on its waste reduction and diversion initiatives moving forward.

Key Findings:

- The following strategies could be used to identify the root causes of litter within the Region:
  - » Gather waste collector feedback to identify where more infrastructure is needed.
  - » Gather information from bylaw enforcement staff and roads crews to identify litter 'hotspots' and possible causes.
  - » Initiate a hotline/online reporting through the Region or local municipal partner websites or app for members of the public to use to report litter 'hotspots'.
- Policy measures aimed at reducing the use of a specific material or package may inadvertently lead to the increased consumption of an alternative that is also problematic.
  - » Regulatory measures taken by other jurisdictions include: community led initiatives; industry led initiatives; material targets; disposal bans; by-request bylaws; and materials bans.

Recommended Actions:

- Demonstrate local level Environmental Stewardship through green procurement options and reduction of single-use plastics within municipal buildings. Provide and incentivize staff and visitors with options to use reusable containers over single-use packaging.

Recommended Actions *continued:*

- Actively participate and align policies with neighbouring municipalities to tackle single-use items to maximize opportunities for harmonization and consistent policymaking.
- Supporting businesses and community groups on waste reduction initiatives.
- Conducting research to better understand the underlying causes of litter in York Region specifically.
- Investing in infrastructure improvements to address those causes, where appropriate, and monitoring impact.
- Actively monitoring the impacts of policies implemented in other jurisdictions to gain insight and ensure policies being considered are designed to minimize substitute effects and do not sacrifice upstream environmental benefits.
- Continuing to consult with businesses and other stakeholders to understand the potential impact of the mandated policy options discussed above to inform policymaking.
- Develop positions and advocacy strategies related to mandatory take-back programs, disposal bans, deposit return, material targets, by-request bylaws, and materials bans.

Link to Objectives:

- **Objective 1:** Successfully navigate legislative change.
- **Objective 3:** Inspire people across the Region to embrace SM4RT Living and advance the circular economy.

Appendix D Summary: Multi-Residential Diversion/Reduction in York Region Memo

Purpose:

- Summarize the current issues/challenges affecting multi-residential buildings and recommend next steps informed by initiatives and best practices observed in other jurisdictions.

Key Findings:

- High variability in diversion performance across audited multi-residential buildings will require customized solutions to address structural and behavioral issues.

Recommended Actions:

- Build on data collection to isolate building specific issues and provide appropriate support.
- Integrate existing RFID weights collected from multi-residential into the existing database.
- Track performance on a geographical basis to identify problematic routes.
- Conduct site visits at buildings with high waste generated per unit.
- Consider revising waste audit categories to focus on problematic materials; vary criteria for building selection e.g. demographics, income, maturity of recycling program, infrastructure; conduct detailed analysis to identify material-specific capture rates.
- Develop new promotion and educational material based on 2019 audits; deliver digitally through social media.
- Develop guidelines and standard forms for staff to determine adequacy of bins and promotion and educational material; coordinate visits with local municipalities at buildings with low capture rates.
- Work with local municipalities to harmonize information and provide a consolidated and easily accessible online toolkit.
- Conduct pilot where in-unit totes are delivered to 2019 audited buildings; consider providing in-unit totes to all multi-residential buildings.

Recommended Actions *continued:*

- Target clean loads of fibre based on end market restrictions; consider facilitating a direct relationship between a cardboard buyer and multi-residential buildings.
- Facilitate working group to include Region staff, local municipalities and multi-residential stakeholders to encourage residents to participate in waste diversion; prepare appropriate supporting materials.
- Determine current financial impacts from low capture and high contamination rates; develop draft financial incentive model and solicit feedback from local municipalities.
- Review effectiveness of current design standards for waste management; consult key stakeholders to present minimum design standard requirements for multi-residential; draft bylaws to enforce non-compliance based on other municipal experiences.
- Train superintendents on communicating diversion programs.
- Consider technology to improve storage and collection e.g. solar powered trash compactors, food waste grinders, underground storage systems.
- Compactor/bin monitoring for on demand pick-ups.
- Promote recycling rewards programs.

Link to Objectives:

- **Objective 2:** Region and local municipalities maintain leadership in waste diversion by researching and sharing best practices, approaches and technologies, particularly for multi-residential buildings.
- Local municipalities include standards for waste diversion and material storage and collection in the approval process for new multi-residential developments.

Appendix E Summary: New and Emerging Initiatives and Technologies in Waste Management

Purpose:

- Conduct a jurisdictional and market scan of new and emerging technologies and initiatives within the waste management industry.
- Summarize findings and identify whether the technology is ready to be implemented for York Region, or be monitored as the technology or initiative is still developing.

Key Findings:

- Applicable technologies and initiatives for York Region were based on its ability to meet one or more of the Region's five key priorities: *Reducing GHG emissions; Increasing cost savings; Increasing overall waste diversion; Decreasing contamination within waste streams; and Aligning local policies with provincial and federal policies.*
- With the proliferation of complex materials to be managed, the Region has to consider technologies and initiatives along the entire waste management supply chain.

Recommended Actions:

- **Using Data to Maximize Diversion:** Immediate focus on data collection at different waste sources to better understand the composition and capture rates; ensure producer responsible material are not inadvertently flowing through municipal waste streams.
- **Cart Based Collection:** Collaborate with local municipalities to consider assessing the impacts of switching to cart based collection; assess the impacts of the blue box transition on residual waste and green bin programs.
- **Electric Trucks:** Monitor findings from the US and other municipalities using electric trucks
- **Autonomous Collection Trucks:** Monitor technology trials and potential impacts on transfer stations.

Recommended Actions *continued:*

- **Underground/Automated Waste Collection Systems:** Consider a study to determine if this system would be appropriate for the Langstaff Development as a model for future developments in York Region.
- **Public Space Green Bin Collection:** Immediate implementation due to low cost and alignment with existing green bin grogram.
- Study Solar Compacting Garbage Bins and identify underserviced areas for its use.
- Monitor end market developments for Construction, Renovation & Demolition Waste.
- **On-Site Organics Management:** Evaluate existing technology and potential applications to address food and organic waste at municipal sites.
- **Mixed Waste Processing:** York Region should actively participate in discussions with Durham Region, and other municipalities to support mutually beneficial investments and advancements.
- **MRF Robotic & Artificial Intelligence Technology:** Continue to monitor as this technology was designed for MRFs, but as the blue box program transitions, the need for this technology may not be relevant.

Link to Objectives:

- **Objective 2:** The Region and local municipalities leverage technology to improve data collection, analysis and information sharing from facilities and operations, in support of greater efficiency and more strategic decisions.

York Region

Appendix F Summary: Residual Waste Processing Plan

Purpose:

- In order to continue to meet the Region's Official Plan target of over 90 per cent diversion from landfill, the Region needs to secure stable long-term energy-from-waste (EFW) processing capacity.
- This Residual Waste Processing Plan considers alternative methods of securing long term processing capacity.

Key Findings:

- The Region can secure up to 120,000 tonnes of annual EFW processing capacity from privately owned facilities.
- Projected residual waste tonnages are not expected to reach levels (250-270,000 tonnes/year) required to support expanded Durham York facility operations until the 2035 to 2040 timeframe.
- Expansion approvals may take up to 8-12 years.
- The Region can secure up to 40,000 tonnes of landfill capacity to manage non-recyclable materials not suitable for EFW.

Recommended Actions:

- That the Region issue an RFP in Q4 2020 to secure up to 120,000 tonnes of annual EFW processing capacity from privately owned facilities. This new contracted capacity will serve as an interim bridge until York Region and Durham Region have enough time and residual waste tonnage to implement expansion of the Durham York Energy Centre to 250,000 to 270,000 tonnes per year.
- The recommended contract structure consists of an initial term of approximately 12 years, beginning in September 2023 at the conclusion of current contracts with Covanta Niagara and the initial term of the Emerald EFW contract. The recommended contract end date of Jan 2036 coincides with the end of the first term of the Durham York Energy Centre (DYEC) operating contract.
- Following this initial term, it is recommended that a series of two to three year optional term extensions be provided between January 2036 and January 2046. This will provide the Region with flexibility on the implementation plan and timing for DYEC expansion.
- In addition, staff recommend that an RFP be issued to secure up to 40,000 tonnes of landfill capacity to manage non-recyclable materials that are not suitable for EFW from the end of its existing contract in June 2025 through January 28, 2046 to coincide with the end of the EFW contracts.

Link to Objectives:

- **Objective 2:** Region secures long-term contracts to recover energy from residual materials.

Appendix G Summary: Initiating a Circular Economy

Purpose:

- Review circular economy activities currently occurring in York Region.
- Conduct jurisdictional scan of other circular economy initiatives and policies.
- Recommend actions that the Region could carry out to address the current linear system and work with stakeholders and collaborate to create and initiate circular economy solutions.

Key Findings:

- Extended Producer Responsibility is a crucial component of the circular economy.
- Most municipal examples of the circular economy have placed an emphasis on engagement with stakeholders, particularly with businesses. Partnerships with businesses and other levels of government can help ensure access to adequate support and resources for a successful circular economy system.
- Through implementation of a circular waste system, the Region has the opportunity to:
  - » Influence upstream design and decision making at all consumer levels.
  - » Support provincial and federal waste prevention, reduction and reuse initiatives.
  - » Engage with residents, non-governmental, and governmental organizations that have some degree of legislative control to effect change in the design and distribution of products.
  - » Develop advocacy positions related to community and sustainable development that support the implementation of efficient and effective waste management systems, and to have consideration of impacts on waste generation and management in the decision making process when such policies are developed.

Recommended Actions:

- Continue to advocate for an Extended Producer Responsibility (EPR) system.
- Develop a Green Procurement Policy that builds repair and reuse into the Region's procurement and discard policies, including a policy regarding preference for durable, repairable, and reusable items.
- Advocating for regulations that support the circular economy by providing frameworks, processes, and/or focusing on specific packaging or products.
- Funding circular economy activities, supporting circular economy research, can accelerate the growth of the circular economy in the Region.
- Create more opportunities for sharing, reusing and repurposing.
- Participate in the Circular Economy community by joining and participating in circular economy groups like the Ellen MacArthur Foundation.
- Develop a municipal circular economy working group, drawing from the Municipal 3Rs Collaborative member group and utilizing their knowledge and expertise.
- Develop an internal Circular Economy Committee. With the purpose of championing internal circular economy activities, developing circular corporate policies, and communicating and educating other employees on circular economy practices.

Link to Objectives:

- **Objective 3:** Inspire people across the Region to embrace SM4RT Living and advance the circular economy.

Appendix H Summary: Final Report of Data Measurement Approach

Purpose:

- Review effectiveness of current data management practices.
- Summarize best practices related to data gathering, performance measurement and reporting methodology in other similar jurisdictions.
- Make recommendations to better measure and report progress on waste reduction and diversion initiatives moving forward.

Key Findings:

- Common ground exists between York Region and local municipalities on tracking and reporting of data:
  - » All municipalities believe that data tracking highlights potential issues
  - » Data informs decision-making (e.g., policies, programs, resource, infrastructure)
- Context and needs for each local municipality were different
- Current data tracking and reporting system has deficiencies
- Four main themes related to top concerns:
  1. Intended audience
  2. Context
  3. Current metrics
  4. Need for new metrics

Recommended Actions:

- Expand the intended audience for the *Balanced Scorecard* and the *Annual Solid Waste Diversion Report* to include federal and provincial governments, local municipal councils, community partners and residents. Combine these two reports into one report.

Recommended Actions *continued:*

- Adapt the *Balanced Scorecard* to group local municipal partners by population density in separate tables. Include a separate analysis for each local municipality to illustrate their five-year trend related to key metrics and associated context (e.g., highlighting new programs that were introduced over the previous year, etc.).
- Amend waste reduction measurement to focus on residual waste and household organic waste. Reset waste reduction targets to take these changes into account.
- Continue to report on the amount of material diverted through municipal programs separately from the waste reduction/generation rates.
- Explore the following additional metrics and consider for future reporting:
  - » Producer responsibility
  - » Accessibility
  - » GHG emission reduction
  - » Recycling efficiency
  - » Financial efficiency
  - » Expand the Datacall spreadsheet to include some additional context to explain changes to municipality's annual waste generation.

Link to Objectives:

- **Objective 2:** Region works with other Ontario municipalities to standardize record-keeping and data reporting across the province to provide consistent evidence for advocacy positions.