## Attachment 1 – Draft Long Term Waste Management Strategy

# PW11.3 - Attachment 1

## Note to Reader: February 11, 2016

This draft document has been prepared for the purposes of consultation. The Phase 3 consultation process will provide an opportunity for the public and stakeholders to provide their feedback on the recommended options as well as input on the approach to implementation. Where appropriate, input from the Phase 3 consultation process will be incorporated into this draft document and finalized for submission to Public Works and Infrastructure Committee (PWIC) and City Council in June/July of 2016.

# Summary

## Initiation of the City of Toronto's Long Term Waste Management Strategy

Waste management and diversion programs in the City of Toronto (the City) have significantly evolved over time. In 2013 City Council recognized the need for an updated comprehensive long term waste management plan and commissioned the development of a Long Term Waste Management Strategy (Waste Strategy). Since 2013, the City has been working through a comprehensive technical evaluation process supported by widespread public and stakeholder engagement activities to develop the draft Waste Strategy document. Policies, programs and technological options and best practices for new and emerging waste diversion and disposal methods were considered and evaluated. The draft Waste Strategy recommends waste reduction, reuse, recycling, recovery and residual disposal policies and programs, in that order, that are cost-effective, socially acceptable and environmentally sustainable for the long term.

The following provides a summary of the key aspects of the draft Waste Strategy:

## Waste Strategy Vision and Guiding Principles to Navigate the Future System

A successful Waste Strategy reflects the interests of the community that it serves, now and in the future. It is driven by a Vision Statement and Guiding Principles that express a philosophy of what the Waste Strategy will strive to achieve and what will be important in making decisions along the way. The following Vision was developed for the future of the City's Integrated Solid Waste Management System.

> *"Together we will reduce the amount of waste we generate, reuse what we can, and recycle and recover the remaining resources to reinvest back into the economy. We will embrace a waste management system that is user-friendly, with programs and facilities that balance the needs of the community and the environment with long term financial sustainability. Together, we will ensure a safe, clean, beautiful and healthy City for the future."*

This vision statement will be used in concert with eight guiding principles developed to support decision making in the future.

## Maximizing the Life of Green Lane Landfill

The development of the draft Waste Strategy placed a priority on maximizing the life of Green Lane Landfill by minimizing the amount of garbage sent for disposal. Several factors that have led to new estimates of the life of Green Lane Landfill to approximately 2040 include:

- The new series of 5Rs (Reduce, Reuse, Recycle, Recover, Residual Disposal) options being recommended through the draft Waste Strategy has the potential to further extend the life of the landfill.
- As part of the draft Waste Strategy, initial projections have been refined with more sophisticated modelling that includes correlation to economic growth factors. With this refinement of the model, it is anticipated that residual waste will not increase over time.
- Review of current landfill operations has revealed that settlement of materials in the site is occurring at a greater rate than initially estimated. Rate of settlement is contingent on the composition of the waste and the analysis suggests that the settlement rate will continue.

Based on the three key findings outlined above, this is almost 10 years more landfill capacity than was previously projected at the beginning of the development of the Waste Strategy. With this additional available capacity, evaluation results have determined that initiating further reviews and studies for expansion of Green Lane Landfill or acquisition of landfills will not be required in the next 10 years.

### A Commitment to Prioritizing Waste Hierarchy through Reduction, Reuse and Recycling

The draft Waste Strategy places emphasis on waste reduction, reuse and recycling activities to promote the importance of resource conservation and reduced environmental impact. The recommended programs require minimal capital investment, but have the potential to reduce the amount of material requiring management by the City by more than 30,000 tonnes per year once fully implemented.

The draft Waste Strategy recommends five new reduction and reuse focused programs for early implementation that address food waste reduction, textiles, sharing and reuse opportunities and supporting ongoing waste exchange programs.

### Leveraging Programs and Services Already in Place in order to Further Improve Waste Diversion Potential

The draft Waste Strategy shows that the City already has in place the programs, infrastructure and services that will assist the City of Toronto in achieving a 70% waste diversion rate which would make them a leader amongst similar-sized cities in North America and world-wide. During the first five years of the Waste Strategy, emphasis will be placed on further improving the performance of the current integrated waste management system by focusing on further improving participation and proper utilization of existing programs and services. This is especially important in the multi-residential and industrial, commercial, and institutional sectors where lack of participation and high contamination rates are prevalent.

A complimentary approach to enforcement of programs, services and by-laws will be implemented to improve system performance, together with ongoing education and engagement activities that could divert an additional 30,000 tonnes annually of material currently being landfilled.

### Strategic System Planning to Minimize the Need for new Capital Infrastructure Investments

The draft Waste Strategy minimizes the need for new capital infrastructure investment (such as energy from waste and other emerging technologies) by placing emphasis on residents and non-residential customers of the City to "do the right thing" by reducing the amount of waste they generate and ensuring participation in already existing reuse and recycling programs.

In later years of the draft Waste Strategy implementation, a mixed waste processing facility with organics recovery is being recommended for further consideration as a final step to recover additional divertible resources before landfilling. This option is being recommended only after the 10 year review is completed in order to determine the success of the Waste Strategy and reassess the need for additional processing and resource recovery technology in the system.

### Working Together with Community Partners to Enhance Access to Diversion Programs, Collaborate in Service Delivery and Increase Citizen Engagement to Support Sustainable Solid Waste Management Practices

The draft Waste Strategy recommends a number of different options where the involvement of community partners will be critical in the successful delivery of these new programs. This will be of particular importance when considering new reuse initiatives such as swap events and waste exchanges. This approach respects the City's diverse population and civic identity through supporting collaboration amongst community members which share neighbourhoods and also fosters opportunities where people can discuss experiences from within their social organizations.

### Maintaining Flexibility for Future Changes to the Waste Management Landscape

Waste management systems are in a constant state of flux with new management technologies and approaches becoming available, changes in consumer buying habits and product packaging and new advances in environmental protection and governing legislation. All these changes require a Waste Strategy that has specific goals, however, is flexible to adapt to a constantly changing environment in which the system operates. The timing of some recommended options considers the newly proposed Bill 151: Waste Free Ontario Act legislation and the potential impacts it may have on how waste is managed in the future in the City.

## Service, Stewardship and Commitment in Continuing to Deliver High Quality and Cost Effective Customer Service for Waste Management Programs

A new cost allocation and sustainable rate model has been developed to support implementation of the Waste Strategy and lead to a fully self-sufficient and sustainable solid waste utility in the future. This new model will ensure that the high quality services, stewardship over our waste management practices and commitment to cost efficient services being provided are done so at a fair and reasonable price to each customer in the system.

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# 1 Importance of Having a Waste Strategy

Waste management and diversion programs in the City of Toronto (the City) have evolved from simple garbage collection to a complex system of collecting source separated materials including Blue Bin materials, Green Bin organics, garbage, Oversized and Metal Items, Electronic Waste and Household Hazardous Waste, as well as a range of other items.

The most recent diversion plan approved by Toronto City Council in 2007, Target 70, outlined a strategy to achieve the goal of 70% diversion by 2010. The plan outlined a number of programs and initiatives including:

- source reduction initiatives;
- development of reuse centres;
- replacement of blue boxes with Blue Bins;
- addition of new recyclable materials;
- implementation of Green Bin organics programs for multi-residential buildings;
- education and enforcement of the City's diversion by-law;
- introduction of a volume-based rate structure;
- investigation of emerging source separation techniques; and,
- development of a residual waste processing facility to recover resources from mixed residual waste.

In 2013, Solid Waste Management Services (SWMS) presented a report to Public Works and Infrastructure Committee (PWIC), which provided a status update of the Target 70% initiatives; an explanation of why 70% diversion was not achieved. It also described plans for moving forward on diversion initiatives in 2013, including the development of a Long Term Waste Management Strategy.

Recognizing the need for an updated comprehensive long-term waste management plan to set the foundation for future planning and coordinated decision making, the City of Toronto commissioned the development of a Long Term Waste Management Strategy in 2013[1].

The draft Long Term Waste Management Strategy (the draft Waste Strategy) recommends waste reduction, reuse, recycling, recovery and residual disposal (the 5Rs) (see Figure 1-1 below for a more complete description of the 5Rs) policies and programs

[1] http://app.toronto.ca/tmmis/viewAgendaItemHistory.do?item=2013.PW21.1

that are cost-effective, socially acceptable and environmentally sustainable for the long term. This is a "triple bottom line" approach that gives consideration to each component during the development of the draft Waste Strategy. The draft Waste Strategy anticipates the future needs of the City and identifies options to meet the needs for all of the City's customers.

Figure 1-1: 5Rs Waste Management Hierarchy

# 2 Developing the Waste Strategy

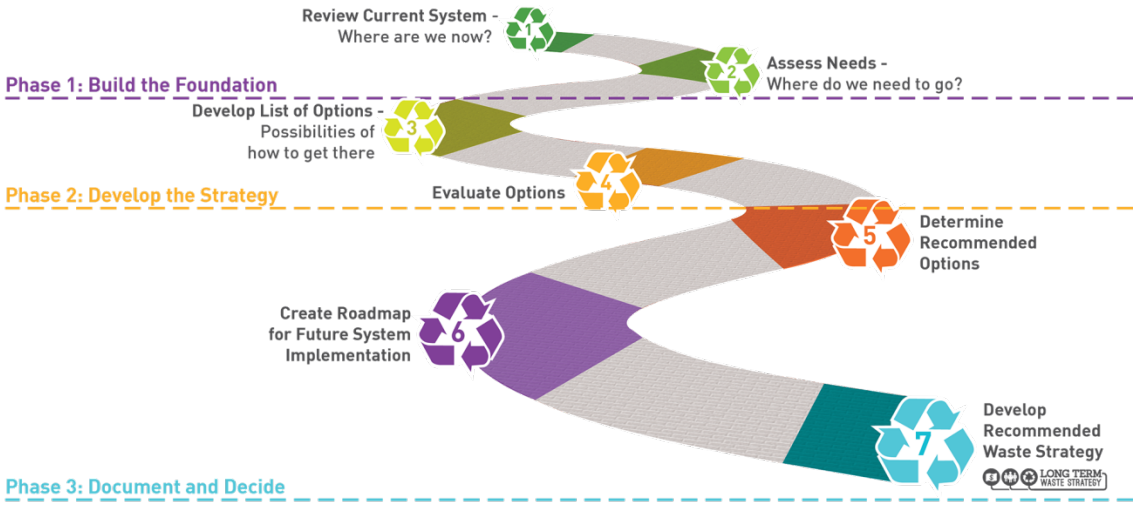
Development of a Long Term Waste Management Strategy is Strategic Action #7 in Council's 2013-2018 Strategic Action Plan. The Long Term Waste Management Strategy is to be developed in partnership with community and divisional stakeholders that are environmentally sustainable and economically viable. The intent of the draft Waste Strategy is to provide a high level decision making document to guide SWMS' policy decisions for the duration of the planning horizon of 30 to 50 years.

The development of the draft Waste Strategy has been governed by five guiding principles that were approved by City Council:

1. Consideration of options which support waste reduction, reuse, recycling and recovery before final disposal;
2. Consideration of all other environmentally approved disposal options to extend the life of Green Lane Landfill;
3. An open and transparent review of the options;
4. Innovation and flexibility to adapt to emerging technologies and changes to the regulatory environment; and,
5. Development of policies and opportunities for collaboration.

The draft Waste Strategy was prepared in three phases with each phase being supported by comprehensive consultation with the public, input from a stakeholder advisory group and key stakeholders including members of City Council. The overall draft Waste Strategy development process is presented in Figure 2-1 with a brief description of each phase of the draft Waste Strategy development process.

Figure 2-1: Waste Strategy Development Process



## Phase 1 - BUILDING THE FOUNDATION

Building the foundation included establishing a comprehensive baseline to identify the current state of all aspects of the City's integrated waste management system and also identified the long-term need of the system in the future.

**Deliverable 1** –"Where are we? Establishing a Comprehensive Baseline"
The purpose of this phase was to document the existing waste reduction, reuse, collection, transfer, processing, disposal and financial systems used to manage waste in the City. This baseline was used as the foundation upon which future programs, policies and facilities' recommendations are based. As part of the baseline, previous strategies that have been developed were taken into consideration, including outstanding recommendations for change such as development of a Mechanical Biological Treatment (MBT) facility. Phase 1 sets the baseline from which future options and recommendations were assessed in the Waste Strategy. The baseline has been documented in Technical Memorandum No. 1[2].

**Deliverable 2** – "Where do we need to go? Identifying the Long-Term Needs"
Once a baseline had been established, projections for the future were developed in order to estimate requirements for waste management for the next 30 to 50 years. Variables that could impact the system including population growth, housing trends, economic growth, product design, packaging changes, City planning initiatives, and potential changes to legislation were reviewed in this phase. Technical Memorandum No. 2[3] documents the gaps, challenges and opportunities in Toronto's integrated waste management system. It includes projections for the future quantities of waste to be managed and the vision and guiding principles to guide the implementation of the Waste Strategy in the future.

## Phase 2 - DEVELOP THE WASTE STRATEGY

In order to develop the draft Waste Strategy, a critical review of the current system was completed. This was done in order to identify areas of opportunity for improvement, as well as to consider policies, programs, and technologies that may help to improve the

[2] http://www1.toronto.ca/wps/portal/contentonly?vgnextoid=98fc8005b7ae7410VgnVCM10000071d60f89RCRD

[3] http://www1.toronto.ca/wps/portal/contentonly?vgnextoid=98fc8005b7ae7410VgnVCM10000071d60f89RCRD

current system and provide for a stable long-term outlook. Where options were identified, they were critically evaluated and, where appropriate, recommended for implementation in the future.

**Deliverable 3 – "How do we get there? Consideration of Options"**

A range of policies, programs, and facility/technology options were reviewed to identify options the City could consider in the future. Options included additional waste reduction and reuse programs and services, other waste diversion techniques and practices, renewable energy projects, waste technologies (e.g. Mixed Waste Processing (MWP)), Energy from Waste (EFW), alternative disposal options (e.g. redirecting waste to other landfills), and long-term opportunities for Green Lane Landfill. Where appropriate, separate options were identified to manage waste from the single family residential and multi-residential sectors since these two sectors have different waste management needs and in some cases may require different programs and infrastructure. Technical Memorandum No. 3[4] identifies and discusses a list of options available to the City and describes the evaluation methodology and criteria used to evaluate each option.

**Deliverable 4 – "Evaluate the possibilities. Identifying the Best Options for the City"**

During this phase, a detailed evaluation of the options identified in Phase 2 was conducted from an environmental, social and financial perspective. This identified a series of recommended long-term options for the City. Technical Memorandum No. 4[5] documents the evaluation process and resulting recommended options for the City.

## Phase 3 – DOCUMENT AND DECIDE

Once the recommendations for change were determined, the draft Waste Strategy document was prepared to identify what the new system will look like, the timing for any proposed changes, the financial requirements to support the new system and the roles and responsibilities of all those involved.

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4 http://www1.toronto.ca/wps/portal/contentonly?vgnextoid=98fc8005b7ae7410VgnVCM10000071d60f89RCRD

5 http://www1.toronto.ca/wps/portal/contentonly?vgnextoid=98fc8005b7ae7410VgnVCM10000071d60f89RCRD

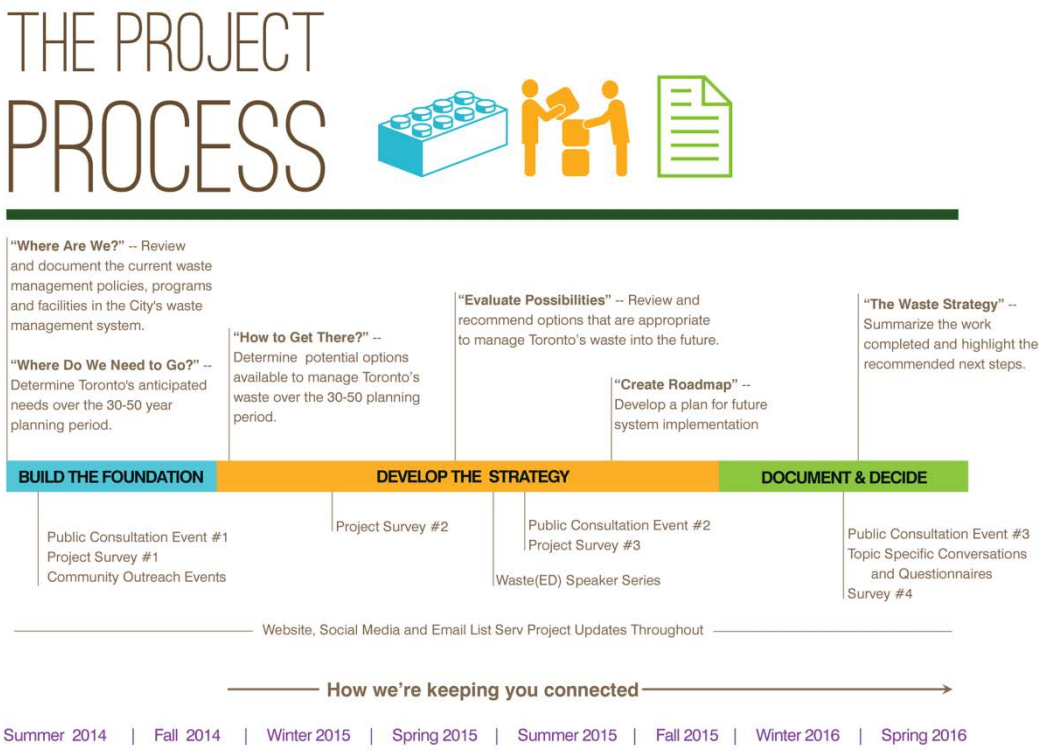
**Deliverable 5 – "Prepare and draft the Long Term Waste Management Strategy document" (SUBJECT OF THIS DOCUMENT)**
The Draft Waste Strategy was developed using the results of the evaluation process. It includes an implementation "roadmap" to help guide the City's integrated waste management system for the next 30 to 50 years. The final Waste Strategy will also include a consultation report documenting the consultation activities conducted and feedback received during development of the Waste Strategy. Reports on consultation completed to date can be found on the City's website[6].

In parallel to the completion of the three phases, a comprehensive consultation plan was implemented to present information, solicit feedback, and provide an opportunity for the community to help guide the development of their future waste management system. Throughout the process, City staff provided regular updates to PWIC on the development of the draft Waste Strategy.

The following Figure 2-2 shows how the consultation plan developed for the draft Waste Strategy was incorporated into the three phases described above.

[6] http://www1.toronto.ca/wps/portal/contentonly?vgnextoid=98fc8005b7ae7410VgnVCM10000071d60f89RCRD98fc8005b7ae7410VgnVCM10000071d60f89RCRD

Figure 2-2: The Project Process



# 3 A Vision for the Future & Guiding Principles

A successful Waste Strategy reflects the interests of the community that it serves now and in the future. It is driven by a Vision Statement and Guiding Principles that express a philosophy of what the Waste Strategy will strive to achieve and what will be important in making decisions along the way. The following provides an overview of the approved[7] Vision and Guiding principles for the draft Waste Strategy.

Further information on the feedback received on the Vision and Guiding Principles during the consultation process can be found in the Phase 2 Consultation Summary[8].

## 3.1 A Vision for the Future

The Vision Statement for the draft Waste Strategy was developed through a combination of feedback received during the Phase 1 public consultation events in June 2014, a visioning session with Stakeholder Advisory Group members and a visioning session with members of the SWMS' Senior Management Team. The resulting draft themes for the Vision Statement were presented to the public in a survey (Survey No. 2) in Phase 2 of the consultation process.

Based on the feedback received during the consultation and engagement period, a final Vision Statement was prepared and approved by City Council in October 2015:

> "*Together we will reduce the amount of waste we generate, reuse what we can, and recycle and recover the remaining resources to reinvest back into the economy. We will embrace a waste management system that is user-friendly, with programs and facilities that balance the needs of the community and the environment with long-term financial sustainability. Together, we will ensure a safe, clean, beautiful and healthy City for the future.*"

## 3.2 Guiding Principles to Stay on Track

The Phase 2 consultation process also presented a list of Guiding Principles. Consultation participants were asked to identify one or more Guiding Principles that were most important to them.

The top three Guiding Principles selected by participants were:

[7] http://app.toronto.ca/tmmis/viewAgendaItemHistory.do?item=2015.PW7.3

[8] http://www1.toronto.ca/wps/portal/contentonly?vgnextoid=98fc8005b7ae7410VgnVCM10000071d60f89RCRD

- Work to Mitigate Climate Change;
- Treat Waste as a Resource; and
- Prioritize our Community's Health & Environment.

Through the consultation process, there were no comments received in opposition to any of the guiding principles, nor were there suggestions that would support removing some from the list. City Council approved in October 2015 the following original list of eight Guiding Principles to support decision making and to guide the implementation of the Waste Strategy in the future:

- Work to Mitigate Climate Change Impacts- To reduce our impact on climate change we will find solutions that reduce greenhouse gas emissions associated with our waste management system.
- Treat Waste as a Resource- Waste is an asset that needs to be conserved. We should make best use of our waste by recovering materials and energy remaining after reducing, reusing, and recycling.
- Prioritize our Community's Health and Environment- The health of our residents and the environment is a priority in decision making to minimize negative impacts and to maximize the benefits.
- Embrace Social Equity- Create an easy-to-use system that all residents and the community can understand and participate in.
- Lead the Change- Strong leadership is taking ownership, leading by action and being responsible for the waste we produce.
- Ensure Financial Sustainability- Financially sustainable solutions that are easy and affordable to maintain by future generations and also help to stimulate economic growth within our community.
- Make the Future System Transparent- Future decisions on the implementation of the Waste Strategy will be open, accessible and based on best practices and facts to find solutions that benefit all.
- Support Development of Community Partnerships- Working together with local community groups and organizations will help us reach our goals and reduce waste more effectively and efficiently.

# 4 The Current Waste Management System

The following provides an overview of the current waste management system components, their function and performance.

## 4.1 Current Integrated Solid Waste Management System Overview

The City of Toronto is the capital of the Province of Ontario and Canada's largest city with a population of 2,615,060 (2011 census). Toronto is one of the world's most diverse cities with approximately half of the population born outside Canada[9].

The City is at the centre of the Greater Toronto Area (GTA), bordered by the Regions of Peel, York and Durham. Geographically, the City spans an area of 630 square kilometers, approximately 21 kilometers from north to south and 43 kilometers from east to west. The City is bordered by Lake Ontario to the south, Etobicoke Creek and Highway 427 to the west, Steeles Avenue to the north and the Rouge River/Scarborough-Pickering Townline to the east. Figure 4-1 provides an overview of the geographic boundaries of the City of Toronto[10].

Figure 4-1: City of Toronto Geographic Boundaries and Neighbouring Municipalities


The City of Toronto provides a comprehensive waste management system that includes providing support and services from the initial generation of waste (or avoidance of

[9] City of Toronto Website - Toronto Facts - Diversity

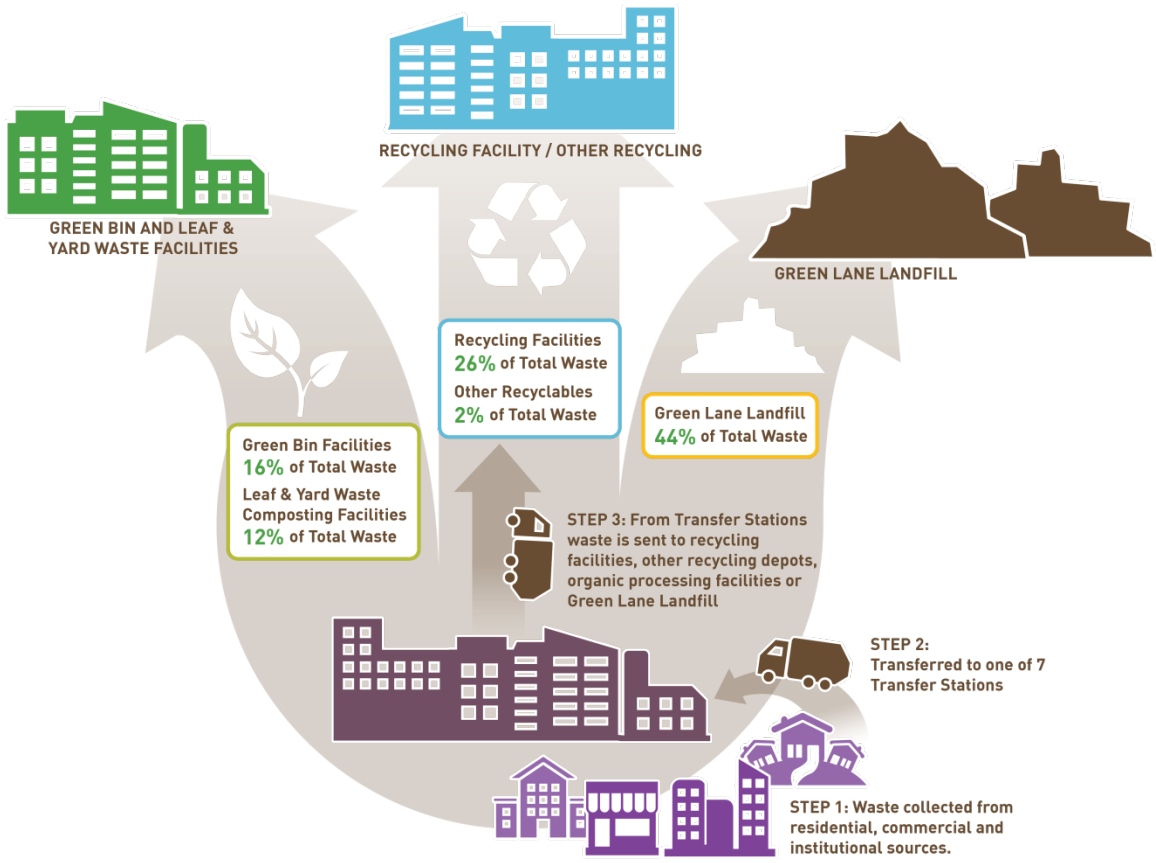
[10] http://commons.wikimedia.org/wiki/File:Greater_toronto_area_map.svg

generation) through to the monitoring of closed landfill sites, long after the final residual waste has been disposed and the site has been closed. This system is a comprehensive network of programs, services, truck fleets, transfer and drop-off facilities, processing facilities, and a landfill. The system provides services to a wide range of customers and is financially supported through a number of funding and revenue sources.

The City of Toronto Solid Waste Management Services Division is one of the largest municipal solid waste management operations in North America.

Figure 4-2 provides a high-level graphic overview of the operational components of the solid waste management system.

Figure 4-2: Solid Waste Management System Overview [11]




[11] Percentages presented are based on 2014 data.

The following provides some quick facts on the City's solid waste management system and the services either supported or delivered in 2014:

### Customers Served[12]

- Residential
  - Single family residences (approximately 450,000);
  - Residential Units Above Commercial (RUAC) establishments (approximately 12,000); and,
  - Multi-residential buildings (approximately 425,000 units).
- Non-Residential
  - Collection
  - Small commercial establishments (approximately 14,500);
  - City of Toronto Divisions, Agencies and Corporations;
  - Charities, Institutions and Religious Institutions;
  - Schools (Elementary and Secondary);
  - Tipping
  - Private Industrial, Commercial and Institutional (IC&I) waste accepted at transfer stations and landfill;
  - Specific service sharing arrangements with other municipalities; and,
  - Drop and load service.

### Quantities of Waste and Materials Managed (2014)

- Collection of:
  - 463,0000 tonnes/year of Blue Bin materials and Green Bin organics for diversion including:
    - Over 215,000 tonnes of Blue Bin materials;
    - Over 138,000 tonnes of Green Bin organics; and,
    - Over 130,000 tonnes of yard waste.
  - over 900 tonnes of Electronics;
  - almost 2,200 tonnes of Household Hazardous Waste (HHW); and,
  - over 43,000 tonnes of Oversized & Metal Items (such as appliances, toilets, plastic outdoor furniture etc.).
- Disposal of approximately 524,000 tonnes of garbage.

### Public Space Bins

- Collection of approximately 8,500 street litter/recycling bins; and,

[12] All numbers presented are based on 2014 data.

- Maintenance and collection of approximately 10,000 park litter bins and collection of litter from public right-of-ways.

### Trucks, Bin Delivery, and Maintenance Operation

- Operation and management of over 600 vehicles and pieces of equipment; and,
- Delivery, maintenance and tracking of approximately 1.6 million Garbage Bins, Blue Bins, and Green Bins.

### Waste Management Facilities

- The City owns and operates:
  - Seven transfer stations (six with HHW depots);
  - A maintenance facility;
  - Four collection yards; and,
  - One litter collection yard.
- The City owns the following facilities which are operated by private contractors:
  - Green Lane Landfill; and,
  - Disco Road Organics Processing Facility[13].
- The City owns the following facilities which are currently not in operation or undergoing construction:
  - Dufferin Material Recovery Facility (MRF[14]); and,
  - Dufferin Organics Processing Facility[15].
- SWMS leases the facility in which the Reuse Centre is operated.
- To ensure the proper maintenance and longevity of its facilities, the City operates a comprehensive asset management program and state of good repair program.

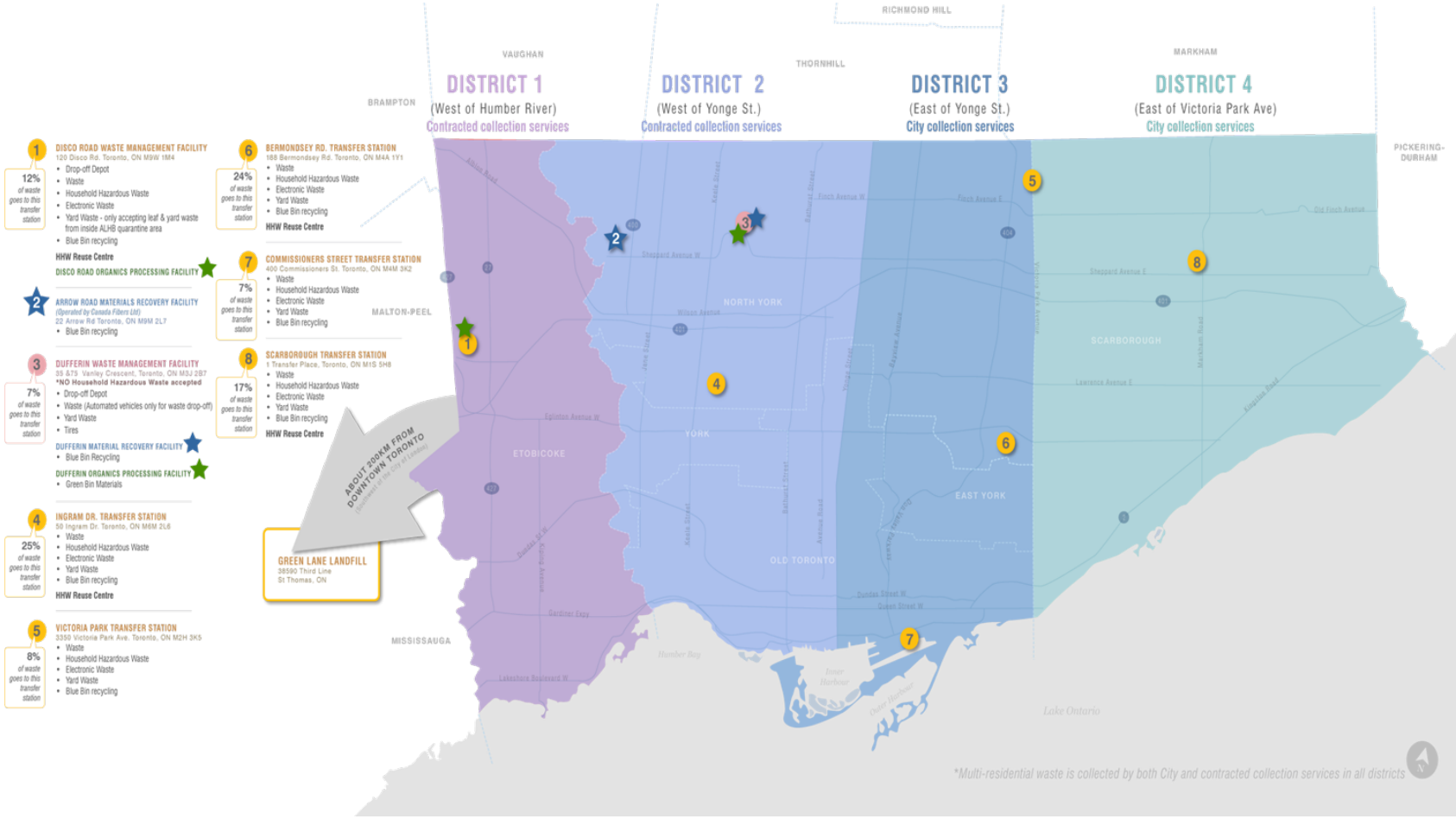
### Closed Landfills Monitoring

- Provision of perpetual care for 160 closed landfill sites.

Figure 4-3 presents a map of the waste management facilities in the City of Toronto and provides a brief description of materials accepted at each facility.

[13] Anticipated completion date Q1 2018
[14] This facility is closed as of November 2014. Blue Bin materials areare processed at a City contracted service provider facility.
[15] Currently shut down in preparation for an expansion.

Figure 4-3: Map of Waste Management Facilities and Collection Districts



For more information on the City's Waste Management System please refer to Technical Memorandum No. 1[16].

## 4.2 Components of the Current Integrated Solid Waste Management System

The City of Toronto operates an integrated waste management system with a wide range of components that function as a whole. It is important to understand each component on an individual basis, as well as how each component contributes to and interrelates with other components of the system. In an integrated waste management system, a change to one component of the system has the potential to impact other components of the system and therefore this interrelationship needs to be clearly understood prior to any changes being implemented.

### 4.2.1 Current Integrated Solid Waste Management System Components

The following Figure 4-4 provides an overview of the components of the City's integrated solid waste management system. The figure helps illustrate:

- the integrated nature of components;
- the flow of waste from generation to final disposal and beyond;
- the 5Rs and solid waste hierarchy priority;
- where each of the 5Rs fit within the system;
- aspects of a circular economy approach[17]; and,
- internal and external influences on the system.

[16] http://www1.toronto.ca/wps/portal/contentonly?vgnextoid=98fc8005b7ae7410VgnVCM10000071d60f89RCRD
[17] "A circular economy… aims for the elimination of waste through the superior design of materials, products, systems and business models." Towards the Circular Economy, Ellen MacArthur Foundation.

Figure 4-4: Components of the System and Potential Influences


### 4.2.2 Internal and External Integrated Solid Waste Management System Influences/Pressures

The City of Toronto's solid waste management services and programs are strongly influenced by a number of policies and legislative requirements both internal and external to the City. More information on the policies relevant to Toronto's solid waste management can be found in Technical Memorandum No. 1[18].

[18] http://www1.toronto.ca/wps/portal/contentonly?vgnextoid=98fc8005b7ae7410VgnVCM10000071d60f89RCRD

# 5 Gaps, Challenges and/or Opportunities

The gaps, challenges and/or opportunities include those components of the system that are either being currently experienced, or will likely be experienced in the future, or an ability for enhancement and/or need of improvement in the future. These gaps, challenges and/or opportunities were identified through a combination of stakeholder consultations, City staff review and input, a jurisdictional review of other similar systems, and the expertise of the consultant team.

This assessment also helped to focus the options identification process to ensure it included areas where gaps, challenges, and/or opportunities do or are anticipated to exist in the future.

A total of 19 primary gaps, challenges and/or opportunities have been identified and are listed in Table 5-1 below (in no particular order of priority or importance). Seventeen gaps, challenges and/or opportunities were originally presented to PWIC and City Council in September/October 2015. Subsequent to these meetings, two (2) additional gaps, challenges, and/or opportunities were identified and have been noted as "New" in the table below. These gaps, challenges and/or opportunities were categorized as either "Programmatic", "Facilities/Infrastructure" or "Internal & External Influences/Pressures" to assist with the evaluation in later stages of the Waste Strategy development process.

Table 5-1: Identified Gaps, Challenges and/or Opportunities

| Gap, Challenge and/or Opportunity | Summary of Challenge |
|---|---|
| Waste Reduction & Reuse | A challenge facing the City is how to better promote and facilitate the reduction and reuse of waste materials to prevent waste from entering the system and requiring management through collection, processing and/or disposal. |
| Dufferin Waste Management Facility | The City has a Material Recycling Facility that closed in November 2014 with no current long-term plan for its future use. A challenge facing the City is to examine the function and role of the entire Dufferin Waste Management Facility to identify future roles within the City's integrated solid waste management system. |
| Multi-residential Waste Diversion | A challenge facing the City is the need for increased waste diversion in the multi-residential sector to support its diversion goals, and reduce the amount of material currently being landfilled. |

| Gap, Challenge and/or Opportunity | Summary of Challenge |
|---|---|
| Performance Measures | A challenge facing the City is having a robust group of performance metrics that will accurately measure the waste management system performance and account for changing waste streams, composition, community demographics, etc. |
| Public Education and Engagement | A challenge facing the City is being able to reach out to a diverse community to educate its customers on program changes, good waste management practices, and where possible, how to better reduce and reuse. |
| Regulatory, Control and Role/ Responsibility Challenges | A challenge facing the City is having a system where some waste management responsibilities are outside of the City's control and therefore subject to uncertainty and risk with respect to external parties making changes that can impact the City's system. |
| Residual Waste Disposal Capacity | A challenge facing the City is to extend the life of Green Lane Landfill and find new waste disposal options to cover the disposal needs for the 30 to 50 year planning period of the Waste Strategy. |
| Solid Waste Services for the Institutional, Commercial &Industrial (IC&I) Sector | A challenge facing the City is trying to find a mechanism to allow the City to influence greater waste diversion in the IC&I sector for waste materials being generated within the City of Toronto, but managed outside the City of Toronto waste management system.<br><br>A challenge facing the City is to provide the IC&I sector with options which promote greater diversion and are flexible to accommodate changing waste streams and customer accessibility. |
| Commissioners Street Transfer Station | A challenge facing the City is the decision needed about the future of the Commissioners Transfer Station (TS); whether it should be relocated or closed. If the facility is relocated, there are options to construct a new facility that may or may not include a residential drop-off facility. If the facility is closed, the City will need to decide how the current services available at the Commissioners TS will be replaced. |
| Future Role of and Need for Drop-off Facilities | A challenge facing the City is to provide its customers with convenient options which promote greater diversion and are flexible to accommodate changing waste streams and resident accessibility. |

| Gap, Challenge and/or Opportunity | Summary of Challenge |
|---|---|
| Value of Food and Food Waste | A challenge facing the City is the need to reduce waste through 1) decreasing the amount of food that is being wasted, and 2) increasing the amount of food waste that is being captured for diversion. |
| Waste Financing System | A challenge facing the City is the development of a sustainable financing strategy that will allow the City to move toward greater waste diversion while balancing program sustainability and in support of the need for long-term infrastructure investments. This sustainable waste financing strategy needs to be specific to waste such that revenues collected and reserve funds established need to be used only for future waste management related expenditures. |
| Waste Recovery Technologies | A challenge the City is facing is diminishing landfill disposal capacity. Alternative processing technologies could divert additional materials from disposal and extend the life of Green Lane Landfill. |
| Future Waste Processing Capacity | A challenge facing the City is to maximize the use of its facilities and infrastructure, in particular waste processing capacity, and maintain sufficient capacity in the system to address its future demands. |
| Impacts of Energy Costs on the Waste Management System | A challenge facing the City is that the system is heavily dependent on energy, in particular for the collection of waste, and energy costs are expected to continue to increase in the future. |
| Impacts of Intensification | A challenge facing the City is the impacts of intensification and the changes required to manage additional waste generated by multi-residential housing units with typically lower waste diversion performance records and in areas that are more difficult to collect using traditional methods. |
| Impacts of a Changing Waste Stream | A challenge facing the City is the constant changing of the waste stream and the ability for programs and infrastructure to adapt. |

| Gap, Challenge and/or Opportunity | Summary of Challenge |
|---|---|
| Solid Waste Services for the Construction, Renovation and Demolition (CRD) Sector (*New) | A challenge facing the City is to address residential renovation waste and provide its renovator customers with convenient options which promote greater diversion and are flexible to accommodate changing waste streams and accessibility.<br><br>An additional challenge facing the City is how to better promote and facilitate diversion of CRD materials generated by the CRD sector, which comprises up to 40% of the total waste stream generated in the City. |
| Enhanced Enforcement Opportunities (*New) | A challenge for the City is to maximize the effective and efficient use of its current programs, services and facilities. To date, significant effort and success has been realized through promotion and education; however, there are still areas of the system where voluntary compliance is not at the desired level, requiring strategic consideration of mandatory measures. |

A detailed discussion of the Gaps, Challenges and Opportunities can be found in Technical Memorandum No. 2[19].

[19] http://www1.toronto.ca/wps/portal/contentonly?vgnextoid=98fc8005b7ae7410VgnVCM10000071d60f89RCRD

# 6 Projected Long Term Needs for the Future

As is evident in a number of the Gaps, Challenges and/or Opportunities, the growth of the City in the future presents both challenges and opportunities for the future system. As part of the development of the draft Waste Strategy, estimates of the future quantities of waste requiring management were calculated based on economic indicators and population projections. A number of factors can influence waste generation and result in an incline or decline in waste tonnes requiring management, including:

- Lightweighting[20] of packaging;
- Change in number of customers served by the City;
- Waste reduction and reuse activities;
- Economic factors; and,
- Seasonal/natural events (e.g., flooding, ice storms, etc.)

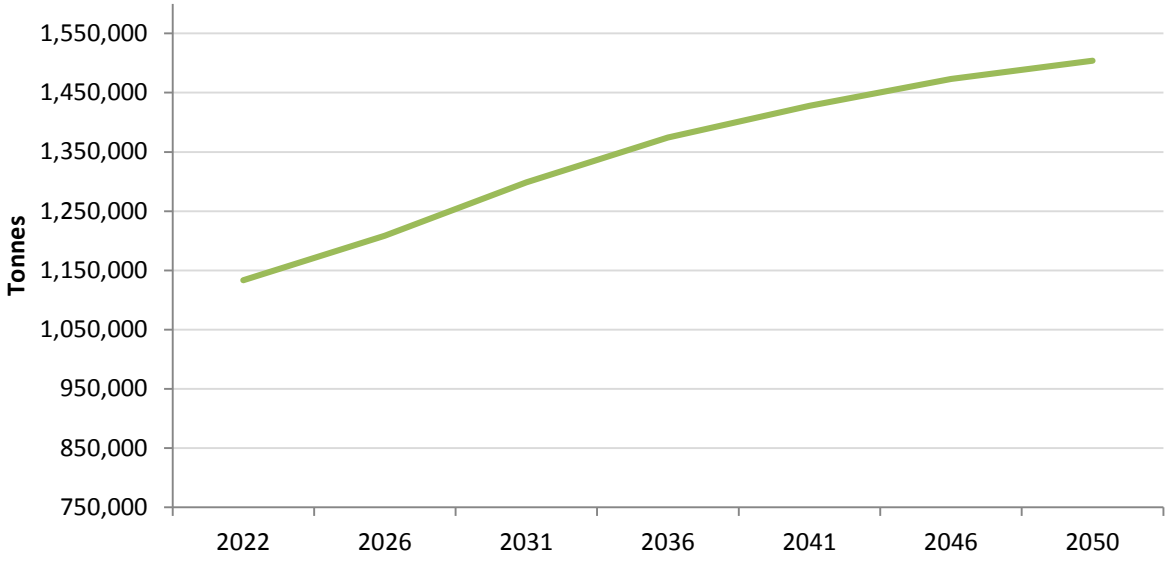
Figure 6-1 provides a historical perspective of waste generation as well as high/low estimates to 2021 based on economic indicators and population growth.

Figure 6-1: Historical and Projected High/Low Total Annual Waste Generation (2001 to 2021), Based on Economic Indicators and Population Growth


[20] Refers to the trend of manufacturing containers such as as plastic water bottles and metal containers to be lighter (i.e. through redesigning with thinner walls).

Figure 6-2 provides a long-term projection of total waste generation from 2022 to 2050 based on population growth. Waste projections from 2022 to 2031 were developed based on population and household projections obtained from the City of Toronto Planning Division and projections from 2032 to 2050 were developed assuming a steady state growth rate similar to the growth rate projected for the 2022 to 2031 period.

Figure 6-2: Projected Total Annual Waste Generation (2022 to 2050), Based on Population Growth




It is estimated that, based on the current system, by 2050 over 1.5 million tonnes of waste will require management.

A detailed discussion of the projections can be found in Technical Memorandum No. 2[21] as well as a number of key findings including the following:

1. In order to develop a model to forecast waste generation, economic indicators needed to be established that could be correlated with waste generation data. The trends between quarterly residential waste generation, Gross Domestic Product (GDP) and population were found to be statistically significant[22]. Some aspects of the downward trend in waste generation noted from 2001 to 2009 (see Figure 6-1) are consistent with what has been found in other cities across Canada and the US, and are related to changing lifestyles and other trends, which have been on-going in the economy and also in residential waste generation since 2001.

[21] http://www1.toronto.ca/wps/portal/contentonly?vgnextoid=98fc8005b7ae7410VgnVCM10000071d60f89RCRD

[22] Statistically significant: There is confidence at the 95 percent level that observed trends between tonnage and the economic indicators are real and not due to random fluctuations. Because of this confidence models can be used to predict tonnage.

2. Because the recent data series is less than five years long, it is insufficient for producing long-term forecasts. It is recommended that at least 10 years of observations be used (ideally without structural breaks) for long-term forecasting purposes. As more observations are collected, the recent data series model can be updated and eventually be the sole model for forecasting waste generation.
3. A series of quarterly waste projections by stream from 2014 to 2021 were developed for a variety of scenarios. These scenarios can be updated with new values for economic indicators and quarterly tonnage data. The City has the opportunity to develop predictive models, which can forecast near term waste generation on a monthly basis. Long-term monthly forecasts can only be produced if monthly economic indicators are forecasted on a long-term basis (more than five years into the future). Relationships between monthly waste generation and monthly economic indicators using the recent data series were also explored. The strongest relationship was found to be between monthly waste generation and monthly city residential building permits. This knowledge can be used to possibly build a near-term prediction model, which can predict the amount of waste generated in the upcoming months.
4. It is estimated that by the end of the planning period, the City could be managing over 1.5 million tonnes annually of material generated by the City's customers (see Figure 6-2).
5. With the implementation of the recommended series of new waste reduction, reuse, recycling, and residual programs and facilities as part of the draft Waste Strategy, the life of Green Lane Landfill could be extended to at least 2040.
6. Based on the projections developed for quantities of Blue Bin materials, and barring any changes to the current system, it appears that there is sufficient processing capacity for the amount of Blue Bin materials collected until the end of the contract period in 2022.
7. Based on the projections developed for tonnages of Green Bin materials requiring management, it is anticipated that the City will require additional processing capacity after 2020 when current contracts with private sector facilities expire.

# 7 Recommended System Additions

The evaluation of potential options followed a four phase approach that used both qualitative and quantitative data where available.

Phase 1: Background Data Collection. Data collection for each option was undertaken so that they could be evaluated. For example, in order to evaluate the relative cost implications of each option, background research was required to develop the cost estimates for each option.

Phase 2: Grouping of Similar Options. For evaluation purposes, similar options that could address specific gaps and or challenges were grouped together into the following categories: Waste Reduction and Reuse; Drop-off Facilities; Commissioners Transfer Station; Recovery (new facilities); Residual Waste; Multi-residential; Industrial, Commercial & Institutional; Construction, Renovation, Demolition; Control, Influence & Enforcement; and Incentive Based Mechanisms. These categories were also important as they reflect the various components of the integrated waste management system (see Figure 4-4 above). Within each category, like options were comparatively evaluated to determine the recommended options. Some of the options identified were not evaluated using the criteria below, but rather will be identified as Future Considerations or Implementation Tools. These options will be considered in the context of what is recommended for implementation (e.g. an Implementation Tool option will be utilized to support the implementation of a recommended program or facility) or a Future Consideration where timing for a more detailed evaluation will be identified (e.g. future processing capacity needs to be considered where there is already capacity in the system for the foreseeable future, and a recommendation on how to proceed is best deferred to a more appropriate time in the future once the impact of recommended programs and facilities is better understood following their implementation).

Phase 3: Application of Evaluation Criteria and Identification of Relative Scoring. The defined evaluation criteria were applied to estimate the potential impacts and opportunities of the specific option, and relative scoring is applied to identify which options "score" higher within a particular grouping of options addressing a common need. For example, the potential impacts to air are identified and those options that help to reduce air emissions (and/or are less than other opportunities being identified) are advantaged over other options that may have greater air emissions.

Phase 4: Recommendation of Preferred Options. Once the data was collected, and the criteria were applied, the options that had the highest "score" were considered advantaged over the others and have been recommended for implementation.

It is important to note that through this evaluation process, multiple options could have been identified as preferred (i.e. options result in similar "scores") and in these circumstances, priority

for implementation has been placed on those opportunities that are more advantaged over others.

The evaluation process concludes with a series of recommended options for implementation in the City of Toronto and have been identified as changes that either: a) have potential for improving the current system; or, b) will provide a potential replacement/ alternative/ substitute for a current component of the system. Table 7-1 presents the list of system components (see Figure 4-4), and the options discussed in the following sections. The options are classified as Programs (P), Facilities/Infrastructure (F/I), Implementation Tools (IT), or Future Considerations (FC), defined as follows:

- Programs (P) – Options that relate to a program or service being provided to customers.
- Facilities/Infrastructure (F/I) – Options that relate to the development of a new facility or piece of infrastructure.
- Implementation Tools (IT) - These options will be considered in the context of what is recommended for implementation (e.g. an Implementation Tool option will be utilized to support the implementation of a recommended program or facility)
- Future Considerations (FC) – The timing for a more detailed evaluation will be identified (e.g. future processing capacity needs to be considered where there is already capacity in the system for the foreseeable future, and a recommendation on how to proceed is best deferred to a more appropriate time in the future once the impact of recommended programs and facilities is better understood following their implementation).

Table 7-1: List of System Components and Options

| System Component | Option Number and Title | Option Type | Gap, Challenge and/or Opportunity |
|---|---|---|---|
| IT=Implementation Tool, P=Program, F/I=Facilities/Infrastructure, FC=Future Considerations | | | |
| Promotion & Education | Option 1.1: Interactive Online Waste Management Tool. | IT | • Public Education and Engagement |
| | Option 1.2: Environmental Impacts Calculator. | IT | • Public Education and Engagement |
| | Option 1.3: Expand Social Media Presence. | IT | • Public Education and Engagement |
| | Option 1.4: Provide Additional Tools and/or Resources to the 3Rs Ambassadors and Other Volunteer Programs. | IT | • Public Education and Engagement |
| | Option 1.5: Incentivizing 3Rs Ambassadors and Other Volunteer Programs. | IT | • Public Education and Engagement |
| | Option 1.6: Targeted Group Communications. | IT | • Public Education and Engagement |
| | Option 1.7: Multi-residential – Workshops and Other Outreach for Buildings Not Receiving City Waste Collection Services. | IT | • Public Education and Engagement<br>• Multi-residential Waste Diversion |
| | Option 1.10: Community Partnership Unit Within Solid Waste Management Services (SWMS) Division. | IT | • Public Education and Engagement |
| | Option 2.1: Outreach and Education Campaign to Reduce Waste. | IT | • Public Education and Engagement |
| | Option 9.6: City to Assume Role of Facilitator to Encourage Industrial, Commercial and Institutional Waste Diversion. | IT | • Public Education and Engagement |
| | Option 9.10: Develop an Advocacy Strategy. | IT | • Public Education and Engagement |
| | Option 9.14: Establish a Circular Economy/Waste Reduction Committee to Inform On-going Waste Planning/Implementation Process. | IT | • Public Education and Engagement |
| Generation, Reduction and Reuse | Option 2.2: Food Waste Reduction Strategy. | P | • Waste Reduction & Reuse<br>• Value of Food and Food Waste |
| | Option 2.3: Textile Collection and Reuse Strategy. | P | • Waste Reduction & Reuse |
| | Option 2.4: Sharing Library. | P | • Waste Reduction & Reuse |
| | Option 2.5: Support Reuse Events. | P | • Waste Reduction & Reuse |

| System Component | Option Number and Title | Option Type | Gap, Challenge and/or Opportunity |
|---|---|---|---|
| IT=Implementation Tool, P=Program, F/I=Facilities/Infrastructure, FC=Future Considerations | | | |
| | Option 2.6: Explore Opportunities for Waste Exchange. | P | • Waste Reduction & Reuse |
| Collection & Drop-off Depots | Option 3.3: Stand Alone Drop-off and Reuse Centres. | F/I | • Drop-off Facilities<br>• Impacts of a Changing Waste Stream<br>• Impacts of Intensification<br>• Waste Reduction & Reuse |
| | Option 3.4: Develop a Network of Permanent, Small Scale Neighbourhood Diversion Stations in Convenient Locations. | F/I | • Drop-off Facilities<br>• Impacts of a Changing Waste Stream<br>• Impacts of Intensification<br>• Waste Reduction & Reuse |
| | Option 3.5: Develop a Mobile Drop-off Service for Targeted Divertible Materials. | F/I | • Drop-off Facilities<br>• Impacts of a Changing Waste Stream<br>• Impacts of Intensification<br>• Waste Reduction & Reuse |
| | Option 9.2: Coordinated and/or Alternative Contracts | IT | • Impacts of a Changing Waste Stream<br>• Impacts of Intensification<br>• Impacts of Energy Costs on the Waste Management System |
| Commissioners Street Transfer Station | Option 4.1: Relocation of Commissioners Transfer Station within the Port Lands Area or Designation of Land for Long-Term Relocation. | F/I | • Transfer Station at Commissioners St.<br>• Impacts of Intensification<br>• Drop-off Facilities |
| | Option 4.2: Redirecting Waste to an Existing Transfer Station(s). | F/I | • Transfer Station at Commissioners St. Impacts of Intensification<br>• Drop-off Facilities |
| | Option 4.3: Procure Transfer Capacity at a Private Transfer Station in Vicinity of the Port Lands Area (if available). | F/I | • Transfer Station at Commissioners St.<br>• Impacts of Intensification<br>• Drop-off Facilities |
| Waste Recycling & Processing | Option 5.3: Future Blue Bin Processing Capacity | FC | • Future Waste Processing Capacity |
| | Option 5.4: Future Green Bin processing capacity | FC | • Future Waste Processing Capacity |

| System Component | Option Number and Title | Option Type | Gap, Challenge and/or Opportunity |
|---|---|---|---|
| IT=Implementation Tool, P=Program, F/I=Facilities/Infrastructure, FC=Future Considerations | | | |
| | Option 5.5: Future Materials Recycling and Other Reuse Related Processing | FC | • Future Waste Processing Capacity |
| | Option 5.6: Dufferin Waste Management Facility. | FC | • Dufferin Waste Management Facility<br>• Multi-residential Waste Diversion<br>• Waste Recovery Technologies |
| Materials & Energy Recovery | Option 6.1: Mixed Waste Processing Facility Development. | F/I | • Waste Recovery Technologies<br>• Multi-residential Waste Diversion<br>• Impacts of Energy Costs on the Waste Management System |
| | Option 6.2: Mixed Waste Processing with Organics Recovery Facility Development. | F/I | • Waste Recovery Technologies<br>• Multi-residential Waste Diversion<br>• Impacts of Energy Costs on the Waste Management System |
| | Option 6.3: Direct Combustion Facility Development. | F/I | • Waste Recovery Technologies<br>• Impacts of Energy Costs on the Waste Management System |
| | Option 6.4: Emerging Technologies Facility Development. | F/I | • Waste Recovery Technologies<br>• Impacts of Energy Costs on the Waste Management System |
| | Option 6.5: Organics Recycling Biocell or Biomodule. | F/I | • Waste Recovery Technologies<br>• Multi-residential Waste Diversion<br>• Impacts of Energy Costs on the Waste Management System |
| | Option 6.6: Refuse Derived Fuel Facility Development. | F/I | • Waste Recovery Technologies<br>• Impacts of Energy Costs on the Waste Management System |
| | Option 6.7: Waste to Liquid Fuel Technologies Facility Development. | F/I | • Waste Recovery Technologies<br>• Impacts of Energy Costs on the Waste Management System |

| System Component | Option Number and Title | Option Type | Gap, Challenge and/or Opportunity |
|---|---|---|---|
| IT=Implementation Tool, P=Program, F/I=Facilities/Infrastructure, FC=Future Considerations | | | |
| Residual Waste Disposal | Option 7.1: Landfill Expansion. | F/I | • Residual Waste Disposal Capacity |
| | Option 7.2: Landfill Mining and Reclamation. | FC | • Waste Recovery Technologies<br>• Impacts of Intensification |
| | Option 7.3: Bio-reactor Landfill. | F/I | • Residual Waste Disposal Capacity<br>• Impacts of Energy Costs on the Waste Management System |
| | Option 7.4: Landfill Operation Continuous Improvement and Best Practices. | FC | • Residual Waste Disposal Capacity |
| | Option 7.5: Adjust Tipping Fees or Customer Base. | F/I | • Residual Waste Disposal Capacity |
| | Option 7.6: Purchase a New Landfill. | F/I | • Residual Waste Disposal Capacity |
| | Option 7.7a: Securing Disposal Capacity to Preserve Long-Term Landfill Capacity at Green Lane Landfill. | F/I | • Residual Waste Disposal Capacity |
| | Option 7.7b: Securing Disposal Capacity for Residual Management Following Green Lane Landfill Reaching its Approved Disposal Capacity. | F/I | • Residual Waste Disposal Capacity |
| | Option 7.8: Greenfield Landfill. | F/I | • Residual Waste Disposal Capacity |
| Overall System Considerations: Multi-residential Services | **Organics Management** | | |
| | Option 2.7: Community/Mid-Scale Composting. | P | • Waste Reduction & Reuse<br>• Value of Food and Food Waste<br>• Multi-residential Waste Diversion |
| | Option 5.1: On-site Organics Processing. | P | • Waste Reduction & Reuse<br>• Value of Food and Food Waste<br>• Multi-residential Waste Diversion |
| | Option 5.2: In-Sink Disposal Units. | P | • Multi-residential Waste Diversion<br>• Impacts of Energy Costs on the Waste Management System |
| | **Waste Collection Methods** | | |

| System Component | Option Number and Title | Option Type | Gap, Challenge and/or Opportunity |
|---|---|---|---|
| IT=Implementation Tool, P=Program, F/I=Facilities/Infrastructure, FC=Future Considerations | | | |
| | Option 3.1: Container management. | P | • Multi-residential Waste Diversion<br>• Performance Measures<br>• Impacts of Energy Costs on the Waste Management System |
| | Option 9.1: Elimination of Collection Service to Multi-residential Buildings. | P | • Multi-residential Waste Diversion<br>• Regulatory, Control and Role/Responsibility Challenges |
| | Option 3.7: Multi-residential Collection using Alternative Vehicles. | F/I | • Multi-residential Waste Diversion<br>• Impacts of Intensification<br>• Impacts of Energy Costs on the Waste Management System |
| | Option 3.2a: Alternative Collection Methods for Multi-residential Buildings - Coloured bags | F/I | • Multi-residential Waste Diversion<br>• Impacts of Intensification<br>• Impacts of Energy Costs on the Waste Management System |
| | Option 3.2b: Alternative Collection Methods for Multi-residential Buildings - Vacuum | F/I | • Multi-residential Waste Diversion<br>• Impacts of Intensification<br>• Impacts of Energy Costs on the Waste Management System |
| | Planning, Policies and Enforcement | | |
| | Option 1.8. Mandatory Multi-residential by-law. | P | • Multi-residential Waste Diversion<br>• Enhanced Enforcement Opportunities<br>• Regulatory, Control and Role/Responsibility Challenges |

| System Component | Option Number and Title | Option Type | Gap, Challenge and/or Opportunity |
|---|---|---|---|
| IT=Implementation Tool, P=Program, F/I=Facilities/Infrastructure, FC=Future Considerations | | | |
| | Option 1.9. Updates to Current Multi-residential Development Standards. | P | • Multi-residential Waste Diversion<br>• Enhanced Enforcement Opportunities<br>• Impacts of Energy Costs on the Waste Management System<br>• Regulatory, Control and Role/Responsibility Challenges |
| Overall System Considerations: Industrial, Commercial and Institutional Services | Option 9.3: Expand City of Toronto Share of Industrial, Commercial and Institutional Waste Management Market To Provide Diversion Opportunities to More Commercial Businesses in City of Toronto | P | • Solid Waste Services for the IC&I Sector<br>• Impacts of a Changing Waste Stream<br>• Regulatory, Control and Role/Responsibility Challenges |
| | Option 9.4: Explore Mandatory Approaches to Industrial, Commercial and Institutional Waste Diversion | P | • Solid Waste Services for the IC&I Sector<br>• Impacts of a Changing Waste Stream<br>• Regulatory, Control and Role/<br>• Responsibility Challenges<br>• Enhanced Enforcement Opportunities |
| | Option 9.5: City of Toronto Exits the Industrial, Commercial and Institutional Waste Management Service. | P | • Solid Waste Services for the IC&I Sector<br>• Impacts of a Changing Waste Stream<br>• Regulatory, Control and Role/Responsibility Challenges |
| Overall System Considerations: Construction, Renovation, Demolition (CRD) Services | Option 10.1: Depots, Processing, and Policies to Divert Construction, Renovation, Demolition Waste | F/I | • Solid Waste Services for the CRD Sector<br>• Impacts of a Changing Waste Stream<br>• Regulatory, Control and Role/Responsibility Challenges<br>• Enhanced Enforcement Opportunities |
| | Option 10.2: Construction, Renovation, Demolition Material Disposal Ban. | P | • Solid Waste Services for the CRD Sector<br>• Impacts of a Changing Waste Stream<br>• Regulatory, Control and Role/Responsibility Challenges<br>• Enhanced Enforcement Opportunities |

| System Component | Option Number and Title | Option Type | Gap, Challenge and/or Opportunity |
|---|---|---|---|
| IT=Implementation Tool, P=Program, F/I=Facilities/Infrastructure, FC=Future Considerations | | | |
| Overall System Considerations: Incentive-based Mechanisms | Option 3.6: Incentive Based Drop-off System (e.g. Reverse Vending Machines). | P | • Impacts of a Changing Waste Stream<br>• Regulatory, Control and Role/Responsibility Challenges |
| | Option 9.8: Deposit-return System for City of Toronto for Selected Materials. | P | • Impacts of a Changing Waste Stream<br>• Regulatory, Control and Role/Responsibility Challenges |
| Overall System Recommendations | Option 9.13: Research, Development, and Innovation Unit | IT | • Public Education and Engagement<br>• Impacts of a Changing Waste Stream<br>• Impacts of Energy Costs on the Waste Management System<br>• Multi-residential Waste Diversion<br>• Impacts of Intensification |
| | Option 9.9: Expanded Blue Bin/Printed Paper and Packaging, Expanded Producer Responsibility Options and Potential Impacts for Toronto. | FC | • Regulatory, Control and Role/Responsibility Challenges |
| | Option 9.11: Green Procurement. | IT | • Regulatory, Control and Role/Responsibility Challenges |
| | Option 9.12: Performance Measures to Define Success and Shape the Future of Waste Management. | IT | • Performance Measures |
| Control, Influence, & Enforcement | Option 9.7: City Explores Mechanisms to Introduce Additional Controls Over Waste Management. | P | • Regulatory, Control and Role/Responsibility Challenges<br>• Public Education and Engagement |
| System Financing and Funding | Option 8.1: Fully Independent Utility with No Rebate Program. | IT | • Waste Financing System |
| | Option 8.2: Public-Private Partnerships (P3) for Major Capital Works. | IT | • Waste Financing System |
| | Option 8.3: Debt Financing. | IT | • Waste Financing System |
| | Option 8.4: Increase Solid Waste Management Services Customer Base. | IT | • Waste Financing System |

| System Component | Option Number and Title | Option Type | Gap, Challenge and/or Opportunity |
|---|---|---|---|
| IT=Implementation Tool, P=Program, F/I=Facilities/Infrastructure, FC=Future Considerations | | | |
| | Option 8.5: Allocating Costs for Waste Management to Applicable Waste Streams. | IT | • Waste Financing System |
| | Option 8.6: Alternative Revenue Generation Opportunities. | IT | • Waste Financing System |
| | Option 8.7: Performance Based Incentives. | IT | • Waste Financing System<br>• Performance Measures<br>• Multi-residential Waste Diversion |

The following sections are organized by system component and identify the options being recommended for implementation.

## 7.1 Promotion & Education

The purpose of solid waste outreach, education and enforcement is to effectively communicate to the City's customers how to participate in the City's waste management programs and to encourage reduction, reuse and recycling of waste.

### 7.1.1 Promotion & Education - Current Programs and Services Overview

The City offers comprehensive promotion and educational tools (some of which are engagement and outreach activities) and resources to its customers, including:

- Videos
- Waste Wizard (online waste sorting tool)
- Collection calendars
- Live Green Toronto
- 311
- 3Rs Ambassador Volunteers
- Community Environment Day Events
- Targeted campaigns and advertisements
- Multi-residential outreach

As part of its ongoing promotion and education efforts, the City maintains a comprehensive website (toronto.ca/recycle) which contains a variety of information.

In addition to the online resources, the City also makes available printed resources such as posters, bin stickers, and sorting guides which can be printed from the website, or hard copies ordered through 311.

For more information on Promotion and Education in the City, please refer to Technical Memorandum No. 1[23].

### 7.1.2 Promotion & Education - Additional Implementation Tools for Consideration

The following provides an overview of implementation tools related to Promotion and Education.

[23] http://www1.toronto.ca/wps/portal/contentonly?vgnextoid=98fc8005b7ae7410VgnVCM10000071d60f89RCRD

Table 7-2: Promotion and Education Implementation Tools

| Implementation Tool | Summary |
|---|---|
| **Option 1.1:** Interactive Online Waste Management Tool. | Enhance the Waste Wizard tool and develop a new online tool and mobile application that can provide various additional SWMS information, such as sorting information, collection schedules, changes/updates to the waste management program and opportunities for reuse, recycling and safe disposal. For example, the tool could allow a postal code to be entered (for an internet-based website) or GPS-enabled to find the closest locations to manage the waste in question and could also provide collection scheduling information for single family and other customers. This tool could help encourage participation as well as help to clarify the complexities associated with Toronto's waste management system and have the ability to provide information in different languages. |
| **Option 1.2:** Environmental Impacts Calculator. | This option looks at the development of an online tool (e.g., mobile application, web-based calculator) that can provide consumer information on the lifetime environmental impacts (otherwise referred to as life cycle analysis) for different products (e.g. plastic versus wooden stir sticks, disposable versus cloth diapers) to help consumers make sustainable decisions and promote waste reduction and behaviour change. For example, to estimate the environmental impacts of disposable diapers, the tool would consider the process involved to extract the materials needed to manufacture the diapers (e.g., cotton, plastic) and the process to manage the materials after use, including the energy and water requirements and emissions to air, water and land. This tool could help encourage participation as well as help to clarify the complexities associated with Toronto's waste management system. The tool could be made available online and as a mobile phone application. |
| **Option 1.3:** Expand Social Media Presence. | Social media can inform people of program changes, provide reduce and reuse tips/videos, clarify system complexities, promote 3Rs (Reduce, Reuse, Recycle) opportunities within the City and through partnerships with local organizations and support behavior change. There is opportunity to address cultural diversity through translating and tailoring messages. Dedicated additional resources can be used to increase the City's online presence through social media and to increase two-way communication. Opportunities include adding/expanding use of social media tools for SWMS purposes such as Facebook, Pinterest, YouTube, Twitter, Instagram, Mind Mixer and the City's website (and other tools as they develop over the planning period). It is recommended a social media strategy be developed that considers the various approaches to increasing the City's presence on social media sites. |
| **Option 1.4:** Provide Additional Tools and/or Resources to the 3Rs Ambassadors and Other Volunteer Programs. | Create an Ambassador forum on the website to facilitate connections with Ambassadors in other neighbourhoods, form community hubs to collaborate on outreach initiatives, and provide a forum for Ambassadors to share ideas, resources and initiatives. Opportunities that the Ambassador forum could include are:<br>• presentation packages for multi-residential building annual general meetings and other building events;<br>• discussion tool-kits on key multi-residential challenges;<br>• opportunities for Ambassadors to share their ideas and initiatives including materials developed;<br>• a map of multi-residential buildings so that Ambassadors could collaborate on initiatives;<br>• discussion group to brainstorm or help plan waste initiatives with the ability to translate to different languages; and<br>• poster/notice templates for building waste initiatives developed by Ambassadors. |

| Implementation Tool | Summary |
|---|---|
| **Option 1.5:** Incentivizing 3Rs Ambassadors and Other Volunteer Programs. | Consider incentives for Ambassadors/volunteers to expand the program's reach in multi-residential buildings. Incentives could include a small honorarium, monthly draws for prizes, recognition awards for outstanding or long-term performance, or passes to City of Toronto events, etc. The City should continue to promote volunteer opportunities through local high schools for students looking to fulfill community service hours and create/promote opportunities during holidays, Professional Activity (PA) days, March Break and summer vacation. |
| **Option 1.6:** Targeted Group Communications. | The City of Toronto has a diverse population and it is challenging to reach customers, particularly for those whom English is not their first language and those that have recently become City residents. This option looks at other communication tactics and alternative communications to ensure that all audiences in Toronto are reached. The communications strategy will establish a consistent approach, branding or look. |
| **Option 1.7:** Multi-residential – Workshops and Other Outreach for Buildings Not Receiving City Waste Collection Services. | Provide on-site workshops/seminars/outreach to buildings that are currently not receiving City collection services to encourage participation in diversion programs, improve program participation, and reduce contamination. |
| **Option 1.10:** Community Partnership Unit Within Solid Waste Management Services (SWMS) Division. | Partnerships with various non-profit and for-profit organizations in the City as well as other partnerships related to waste reduction. This initiative would be managed by a specially established Community Partnership group within the Division or with partnership/collaboration with other City Divisions where applicable The group would develop mutual arrangements with external agencies or organizations, monitor and track annual performance, and evaluate partnerships on an on-going basis to work together to encourage and promote waste diversion. |
| **Option 2.1:** Targeted Outreach and Education Campaign to Reduce Waste. | Continue to develop outreach and education campaigns designed to encourage people to think about the impact of their purchasing and consumption choices. As demographics and lifestyles change, more convenience items are being developed that contribute to waste generation. Develop targeted outreach and education campaigns to promote reduction of waste. |
| **Option 9.6**: City to Assume Role of Facilitator to Encourage Industrial, Commercial and Institutional Waste Diversion. | The City assumes a role of a facilitator/ coordinator to help the Industrial Commercial and Institutional (IC&I) sector (including those not receiving City service) implement waste reduction, reuse, and recycling activities. City would play a role of educator and outreach coordinator to help businesses understand the benefits of waste diversion and help them to facilitate adoption of waste diversion activities.<br><br>NOTE: The proposed *Waste-Free Ontario Act* identifies potential changes with respect to the management of waste from IC&I sources. Any consideration of involvement by the City in the IC&I sector should be done so in consideration of potential Provincial initiatives to prevent conflict and/or overlap in services, requirements, etc. |
| **Option 9.10:** Develop an Advocacy Strategy. | The City of Toronto develops an advocacy strategy to support the implementation of the Waste Strategy.<br><br>NOTE: The proposed *Waste-Free Ontario Act* could have a significant impact on how waste is managed in the future in the City of Toronto. The City will need to have a specific strategy with respect to advocacy and this new legislation including points of interest, |

| Implementation Tool | Summary |
|---|---|
| | areas of concern and specific positions with respect to potential proposals from the Province. |
| **Option 9.14:** Establish a Circular Economy/Waste Reduction Committee to Inform On-going Waste Planning/Implement ation Process. | The current trend in waste reduction is the concept of a circular economy. There is considerable interest in how to move the economy from a linear model (in which natural resources and energy are extracted and made into goods that are then used and discarded as waste) toward a circular model in which everything is designed for reuse, disassembly and remanufacturing. This option would establish a Committee that would address circular economy issues for Toronto and support City efforts to reduce waste and support innovation. |

As the implementation of each of the recommendations detailed below is undertaken, the above described tools should be considered to further enhance the potential success of each recommendation.

## 7.2 Reduction & Reuse

The City supports reduction and reuse of waste through a number of initiatives and programs detailed in Technical Memorandum No. 1[24]. By following the waste hierarchy in the overall consideration of options it allows for options related to reduce, reuse and recycle to be considered first and their potential impact of the future needs for less desirable activities like waste disposal. This approach is consistent with the waste hierarchy that recognizes the resource value of waste and places a priority on the first 3Rs which is consistent with the overall vision and guiding principles of the Waste Strategy.

SWMS staff are constantly exploring new opportunities to promote waste reduction and reuse to help reduce the amount of waste requiring collection, processing and disposal and thereby reducing costs and extending the life of valuable waste management infrastructure.

The following sections provide an overview of the options that will form the "10 Year Plan" to encourage waste reduction and reuse.

### 7.2.1 Reduction & Reuse - Rationale & Importance

There are a number of gaps, challenges and/or opportunities facing the City currently and in the future with respect to reduction and reuse. These include:

- Value of Food and Food Waste: the need to 1) decrease the amount of food that is being wasted, and 2) increase the amount of food waste that is being captured for diversion.
- Public Education and Engagement: being able to reach out to a diverse community to educate its customers on program changes, good waste management practices, and where possible, how to better reduce and reuse
- Waste Reduction & Reuse: how to better promote and facilitate the reduction and reuse of waste materials, including textiles, to prevent waste from entering the system and requiring management through collection, processing and/or disposal.

Based on these specific challenges the following options were considered for implementation:

- Option 2.2: Food Waste Reduction Strategy
- Option 2.3: Textile Collection and Reuse Strategy
- Option 2.4: Sharing Library
- Option 2.5: Support Reuse Events
- Option 2.6: Explore Opportunities for Waste Exchange

[24] http://www1.toronto.ca/wps/portal/contentonly?vgnextoid=98fc8005b7ae7410VgnVCM10000071d60f89RCRD

### 7.2.2 Reduction & Reuse - Recommended Options for Implementation

The comparative evaluation process applied a number of evaluation criteria to each option. The criteria were organized into three categories representing the three fundamental pillars of sustainability (Environmental, Social and Financial) and supported a triple bottom line analysis of each option[25].

Based on the application of the approved evaluation criteria and utilizing priorities, where applicable, the following options are recommended for implementation in the future.

Table 7-3: Recommended Reduction and Reuse Options

| Option 2.2:<br>Food Waste Reduction Strategy |
|---|
| This option involves the development of a strategy that promotes reduction of food waste,(potentially up to 3% additional diversion from landfill) focusing on information and outreach programs to educate residents about the benefits of food waste reduction from an economic, environmental and social perspective. If successful, this option would reduce the need for new organics processing infrastructure, and would lower the amount of both Green Bin organics and garbage to be managed. |
| Option 2.3:<br>Textile Collection and Reuse Strategy |
| This option involves the development of a textile diversion awareness campaign and the provision of separate textile (e.g. clothing, shoes, curtains, sheets, towels) diversion opportunities that would enable textiles to follow the 5Rs hierarchy and be reused or recycled and potentially divert an additional 1% of waste from landfill. |
| Option 2.4:<br>Sharing Library |
| Additional opportunities could be developed to allow the public to sign-out materials that are used infrequently. This could be accomplished by partnering with existing organizations within Toronto (e.g., tool sharing library, bike sharing) or establishing new sharing programs in different areas of the City and/or within multi-residential buildings. Materials can be donated to the libraries or organizations can purchase and cover expenses through user fees. |
| Option 2.5:<br>Support Reuse Events |
| This City could support reuse events that allow residents to obtain gently used materials for reuse (e.g., furniture, toys) in a convenient, yet structured way so that the events do not contribute to litter or illegal dumping. The events could include garage sales, curbside giveaway events in common areas (for multi-residential buildings) or at curbside (for single-family households), swap events (e.g., parent-to-parent sales, jewelry or clothing exchanges). |
| Option 2.6:<br>Explore Opportunities for Waste Exchange |

[25] See Technical Memorandum No. 3 – Options Identification and Evaluation Process and Technical Memorandum No. 4 for a description of the evaluation process and Technical Memorandum No. 4 – Detailed Evaluation of Options.

This option involves the establishment of a waste exchange centre and/or partnership with existing organizations that collect gently used materials, such as arts and crafts supplies, school and office supplies, construction and demolition waste, plastic containers, etc.

The following provides a summary of the Objectives, Benefits, Performance Expectations, Timeline and Implications of implementing these recommendations.

### 7.2.3 Reduction & Reuse - Primary Objectives and Benefits

The following provides an overview of the primary objectives and benefits of proceeding with the implementation all of these recommendations:

- Estimated 200,000 tonnes reduced/reused over the 10 year period or approximately 4% additional annual diversion.
- Estimated increase of 200,000 additional tonnes diverted from Landfill over the 10 year period or approximately 4% additional annual diversion.
- Estimated reduction of approximately 3-4% in waste diversion overall for the City once programs are fully implemented[26].
- Builds public knowledge of waste targets and issues potentially resulting in long-term change in attitudes and behaviour around waste.
- Reduces the amount of food waste in households, resulting in savings on grocery bills.
- Reinforces message of food sustainability.
- Raises environmental consciousness through food waste reduction message.
- Increases attention and participation in sustainable food movement and food security issues.
- Reduces the amount of textiles in the garbage stream.
- Increases awareness of the benefits of recycling/reusing used textiles.
- Has potential to be integrated with other initiatives, such as neighbourhood depots.
- Provides cost savings to users of sharing libraries.
- Provides opportunities for community engagement.
- Improves equality by offering useful materials and objects to all, regardless of income.
- Increases potential for new items, such as toys, to be donated through depots and local organizations.
- Provides cost saving opportunities to residents to access used goods at either reduced rates or for free instead of buying new.
- Creates reuse opportunities and therefore reduces waste sent for recycling or disposal and increases the diversion of materials that could have otherwise ended up in landfill.
- Can unite a community as people interact with each other and get to know their neighbours through community events.

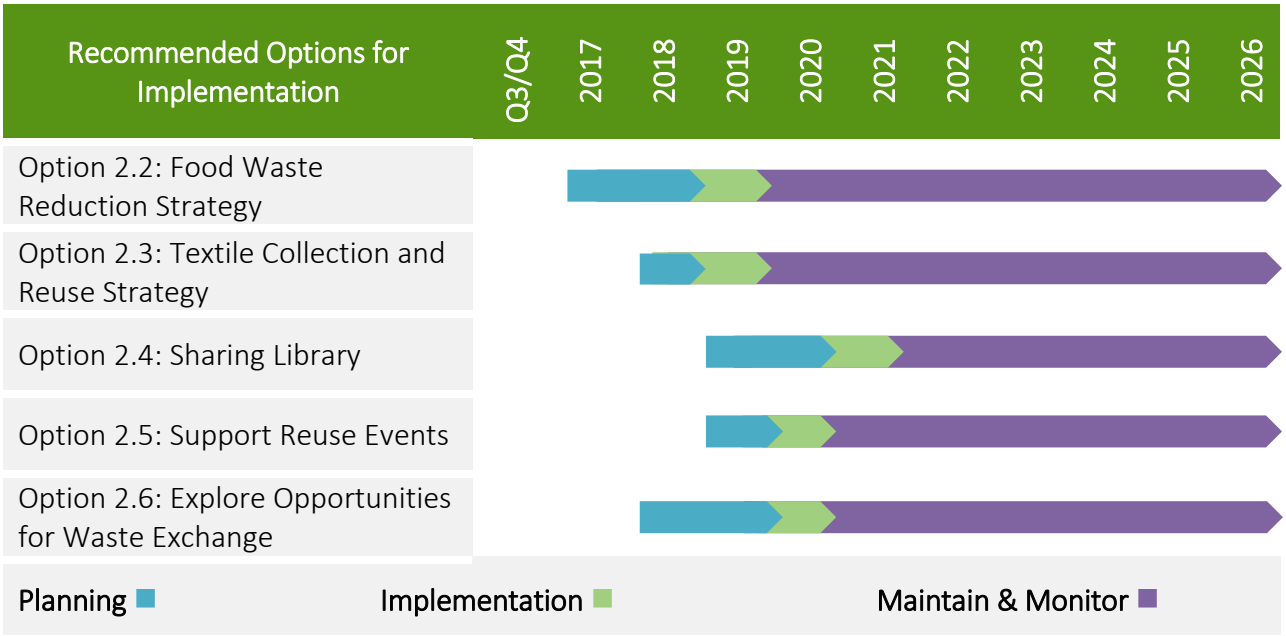
[26] By reducing the amount of waste being generated, and assuming the waste being reduced, would have likely been diverted originally, the waste diversion rate for the City will decrease which is positive because it means less waste has to be collected and processed.

- Creates good opportunities for promotion through schools and universities that have student housing.
- Creates beneficial uses for discarded materials.
- Increases awareness of the need for surplus supplies in the community.
- Provides opportunities for collaboration among residents, partnering organizations and among a variety of industries.
- Reuse of goods may save residents money and provide revenue for partnering organizations.

### 7.2.4 Reduction & Reuse - Proposed Timeline for Implementation

The following provides an overview of the proposed timeline for implementation over the next 10 years:

Table 7-4: Reduction and Reuse Recommendations – Proposed Timeline for Implementation




### 7.2.5 Reduction & Reuse - Long Term Implementation and Operational Considerations

By 2026, these recommendations should be fully implemented and operational. There are no additional Reduction and Reuse options currently being recommended for implementation post 2026.

## 7.3 Collection & Drop-off Depots

SWMS provides collection of waste at the curb, at transfer stations, drop-off depots, and at Community Environment Days from the single family and multi-residential sectors, as well as from the non-residential sector. Where possible, the City has moved to automate its collection system whereby collection containers are emptied by an automated arm positioned on the

truck, versus semi-manual loading of materials. Waste materials received at transfer stations and drop-off depots are charged a fee depending on the type and quantity of material delivered.

The following relates primarily to the need for additional drop-off opportunities for customers. Any issues related specifically to collection have been addressed according to specific customers that have been identified in the overall system considerations found in Sections 7.8 7.9, 7.10 and 7.11 of this draft Waste Strategy.

For more information on collection and drop-off provided by the City, please refer to Technical Memorandum No. 1[27].

### 7.3.1 Collection & Drop-off Depots - Rationale & Importance

A challenge facing the City is to provide its customers with convenient options which promote greater diversion and are flexible to accommodate changing waste streams and resident accessibility. Another challenge facing the City is the impact of intensification and the changes required to manage additional waste generated by multi-residential buildings with typically lower waste diversion performance records and in areas that are more difficult to collect from using traditional methods. Based on these challenges, a range of options were considered, including:

- Option 3.3: Develop a Series of Stand Alone Drop-off and Reuse Centres
- Option 3.4: Develop a Network of Permanent, Small Scale Neighbourhood Drop-off Depots in Convenient Locations
- Option 3.5: Develop a Mobile Drop-off Service for Targeted Divertible Materials

### 7.3.2 Collection & Drop-off Depots - Recommended Options for Implementation

The comparative evaluation process applied a number of evaluation criteria to each option. The criteria were organized into three categories representing the three fundamental pillars of sustainability (Environmental, Social and Financial) and supported a triple bottom line analysis of each option[28].

There is a positive link between Options 3.4 (Neighbourhood Drop-off Depots) and 3.5 (Mobile Depots). It has been recommended that Option 3.5 be planned and implemented first to support research to help effectively locate the 10 - 20 Neighbourhood Drop-off Depots to be established across the City by 2031. This combination of a mobile service and locally based Neighbourhood Drop-off Depots provides the best complement to the City's extensive curbside programs (i.e. in terms of encouraging additional non-curbside, non-Blue Bin material diversion from landfill). The

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27 http://www1.toronto.ca/wps/portal/contentonly?vgnextoid=98fc8005b7ae7410VgnVCM10000071d60f89RCRD

28 See Technical Memorandum No. 3 – Options Identification and Evaluation Process and Technical Memorandum No. 4 for a description of the evaluation process and Technical Memorandum No. 4 – Detailed Evaluation of Options.

convenience of this combination for city residents is the best option for cost effectiveness and for increasing waste diversion, as well as providing the most number of options to divert materials not currently collected in the curbside or multi-residential services.

Based on the application of the approved evaluation criteria and utilizing priorities where applicable, the following options are recommended for implementation in the future.

Table 7-5: Recommended Collection and Drop-off Depot Options

| OPTION 3.4:<br>Develop a Network of Permanent, Small Scale Neighbourhood Drop-off Depots in Convenient Locations |
|---|
| This option is based on establishing 10 to 20 staffed neighbourhood drop-off depots (over the next 7 to 15 years, generally to be located in accessible locations near transit. The facilities could be City owned and operated, privately contracted or some stations could be developed in partnership with local community based organizations (some of which already provide material specific drop-off and reuse services/locations to their customers).<br><br>An important assumption regarding this option is that it would need to be considered as either a complement to or an alternative for the larger scale stand alone depot system described in Option 3.3[29]. It is assumed, for example (unlike the larger, one-stop stand alone depots), for space, permitting and health and safety considerations, neighbourhood depots would not accept residential waste or organic materials.<br><br>NOTE: The proposed *Waste-Free Ontario Act* considers different collection services, including depot type services. The City will need to better understand the potential implications of this new legislation on this option, prior to its implementation. |
| OPTION 3.5:<br>Develop a Mobile Drop-off Service for Targeted Divertible Materials |
| This option is based on creating a "fleet" of up to five dedicated mobile depots that would travel to locations across the City to collect small household items (pots and pans, etc.) and textiles (clothing, household linens), Household Hazardous Waste and other recyclable/reusable materials. An added benefit of the mobile depot service is that it could also be used to support and co-promote other sustainable environmental practices across the city (e.g. water conservation, energy conservation, alternative cleaners, food waste reduction, renewable energy, etc.). Priority would be placed on collection of high value, low volume materials which are easier to manage and store due to limited capacity in the vehicles. Collection vehicles could be the size of a tractor trailer suitable for larger locations, with one or more smaller vehicles available to access smaller locations. These mobile depots could be used to support community events (e.g. neighbourhood swap events), move-outs (student and/or multi-residential), and household clean-outs on a reservation basis, and/or could move to different areas of the City on a pre-determined basis. Non-profit groups could assist with collection/sorting of materials collected at larger events. |

[29] See Technical Memorandum No. 4

| OPTION 3.4:<br>Develop a Network of Permanent, Small Scale Neighbourhood Drop-off Depots in Convenient Locations |
|---|
| NOTE: The proposed *Waste-Free Ontario Act* considers different collection services, including depot type services. The City will need to better understand the potential implications of this new legislation on this option, prior to its implementation. |

The following provides a summary of the Objectives, Benefits, Performance Expectations, Timeline and Implications of implementing this recommendation.

### 7.3.3 Collection & Drop-off Depots - Primary Objectives and Benefits

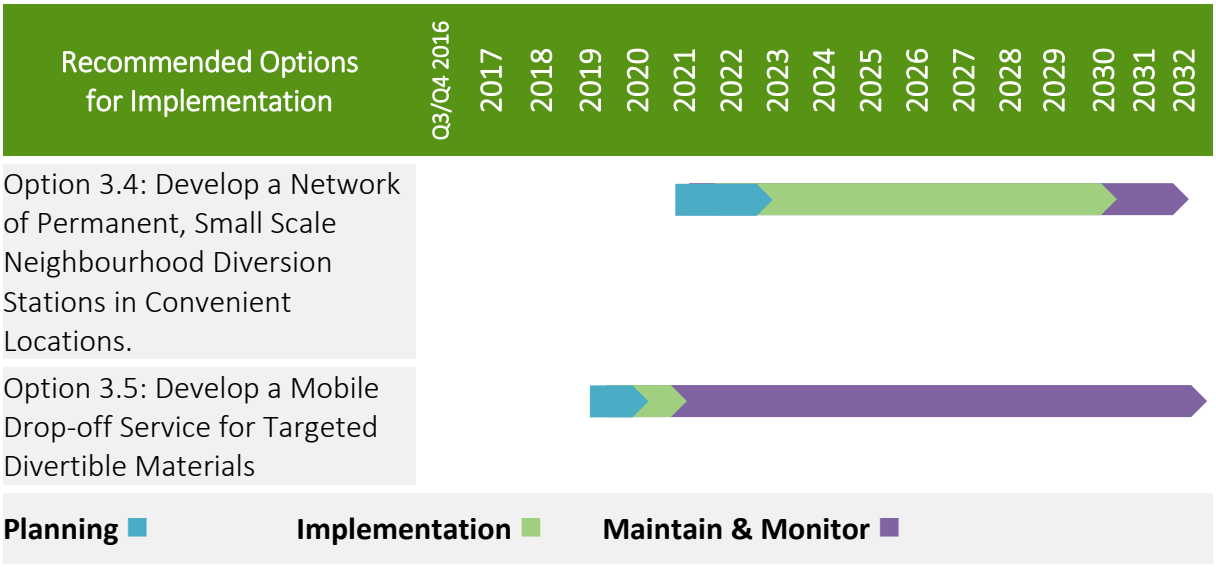
The following provides an overview of the primary objectives and benefits of proceeding with the implementation of this recommendation:

- Estimated 100,000 additional tonnes diverted from landfill over the 10 year period.
- Estimated approximately 33% increase in waste diversion overall for the City.
- Supports expanded drop-off opportunities and convenience for single family residential and multi-residential buildings and small businesses.
- Encourages greater diversion/exchange of reusable materials (e.g. books, clothing, furniture, carpets, small appliances).
- Increases diversion of Household Hazardous Waste (HHW), Electronics, Oversize and Metal Items, textiles and other materials remaining in the current waste stream from landfill.
- Provides opportunity for outreach to profile waste reduction and other sustainability activities in the City.
- Provides opportunities to engage not-for profit sector and charitable groups.

### 7.3.4 Collection & Drop-off Depots - Proposed Timeline for Implementation

The following provides an overview of the proposed timeline for implementation over the next 12 years.

Table 7-6: Drop-off Depot Recommendations – Proposed Timeline for Implementation




### 7.3.5 Collection & Drop-off Depots - Long Term Implementation and Operational Considerations

By 2026, at least 10 of the recommended depots should be fully implemented and operational. Additional Collection & Drop-off Depot options include depots to be implemented post 2026.

### 7.3.6 Additional Collection-Related Implementation Tools for Consideration

The following provides an overview of implementation tools related to collection and drop-off in the future.

Table 7-7: Alternative Service Delivery Contract Approaches Implementation Tool

| Implementation Tool | Summary |
|---|---|
| **Option 9.2:** Coordinated and/or Alternative Contracts | The City of Toronto typically procures specific solid waste management services on an individual basis. This option involves consideration of procuring waste management services with alternative contract terms in order to facilitate more efficient and cost effective service delivery from private sector contractors. This may include combining services under one contract which have historically been treated separately (i.e. collection, transfer, processing and disposal are typically all contracted on their own). Alternative contract terms may include a longer contract period to provide the private sector with additional flexibility for developing or providing infrastructure requiring significant investment of capital and financing. Other options include partnerships to procure services (e.g. coordinating contracts with other City Divisions) to recognize greater economies of scale or modifications to specifications, such as collection on only one side of the street, where appropriate. These types of options are best considered when preparing contract documents for new collection services, rather than trying to implement during the middle of an ongoing contract.<br><br>NOTE: The proposed *Waste-Free Ontario Act* could have a significant impact on how waste is managed in the future in the City of Toronto. Following adoption and implementation of the legislation, the City will need to assess implications for and effects on existing and potential contracts. |

The following provides some commentary with respect to one side of street collection.

<u>Commentary</u>

As discussed in the summary above, the move towards one side of the street collection is best considered when preparing contract documents for new collection services, rather than trying to implement during the middle of an ongoing contract. However, based on some initial research completed as part of the development of the draft Waste Strategy, the following items should be considered:

- Legal concerns with respect to the Ontario Highway Traffic Act and the legal nature of the City requesting individuals to cross streets at unmarked locations. This matter will be referred to internal legal counsel for an opinion on this issue and can be provided in the Final Waste Strategy document;
- Safety concerns will be identified with requesting residents to cross streets at unmarked locations. This matter will be referred to the City's corporate safety division for an opinion on the issue and can be provided in the Final Waste Strategy document; and,
- Litter and Container related issues with respect to residents being responsible for the timely return of emptied containers located in front of someone else's residence which may require modifications to the City's by-law to support.

As the implementation of each of the recommendations is undertaken, the above described implementation tool should be considered to further enhance the potential success of each

recommendation. For more information on this option please refer to Technical Memorandum No. 3[30]

## 7.4 Commissioners Street Transfer Station

The City owns and operates seven transfer stations (see Figure 4-3: Map of Waste Management Facilities and Collection Districts for locations within the City) which accept waste from collection vehicles for transfer to other facilities and serve as Drop-off depots for additional types of waste from residents and small commercial haulers. In general, the City's transfer stations are mainly used to transfer Blue Bin materials, Green Bin organics, yard waste, and garbage.

For more information on waste transfer services provided by the City, please refer to Technical Memorandum No. 1[31].

### 7.4.1 Commissioners Street Transfer Station - Rationale & Importance

There is a specific challenge related to the proposed relocation of the Commissioners Street Transfer Station as part of the waterfront development (i.e. the Port Lands Acceleration Initiative) in that the current transfer station land use does not fit with the overall vision for the area in the future. This transfer station provides the only City-owned downtown option for residents to drop off waste materials (including household hazardous waste). It is also the closest transfer station for City collection vehicles and City-contracted service providers to unload waste collected from downtown routes. If the facility is closed, there will be a need to decide how the current services available at the Commissioners Street Transfer Station will be replaced. Based on this specific challenge, a range of options were considered including:

- Option 4.1: Relocation of Transfer Station within the Port Lands Area or Designation of Land for Long-Term Relocation.
- Option 4.2: Redirecting Waste to an Existing City of Toronto Transfer Station(s).
- Option 4.3: Procure Transfer Capacity at a Private Transfer Station in Vicinity of the Port Lands Area

The Commissioners Street Transfer Station is an essential component of the City's system required to deliver waste management services to the downtown core. A facility located at or in close proximity to the current facility will be required in the future in order to continue service provision in this growing part of the City.

30 http://www1.toronto.ca/wps/portal/contentonly?vgnextoid=98fc8005b7ae7410VgnVCM10000071d60f89RCRD

31 http://www1.toronto.ca/wps/portal/contentonly?vgnextoid=98fc8005b7ae7410VgnVCM10000071d60f89RCRD

### 7.4.2 Commissioners Street Transfer Station - Recommended Options for Implementation

The comparative evaluation process applied a number of evaluation criteria to each option. The criteria were organized into three categories representing the three fundamental pillars of sustainability (Environmental, Social and Financial) and supported a triple bottom line analysis of each option. The following provides a brief discussion of the evaluation results within each of the evaluation categories:

- Option 4.1 (Relocation of Transfer Station within the Port Lands Area) provides for the continuation of the City's existing waste transfer station service within the Port Lands area and assumes a site size that would be sufficient to provide a full suite of services over the long term with intensification in the downtown core and Port Lands area. At this time, it is not known if the City is able to acquire the necessary property, either in terms of location or size, to accommodate a transfer station in this area of the City. The potential exists to design the facility and its operations on a smaller site area or irregular lot shape, although this is expected to have an effect on:
    - level of service (i.e. the transfer station may not be of sufficient size to manage all waste streams including garbage, Blue Bin materials, Green Bin organics, yard waste etc.);
    - flexibility in managing waste from other City divisions such street sweepings from Transportation Services;
    - contingency capacity for other transfer stations;
    - vehicle queuing, loading/unloading;
    - logistics related to truck movements and storage;
    - future capacity to manage greater volumes and types of waste; and,
    - capital and operating costs (e.g. potential for increased costs if more collections operations loads are managed or private/residential tipping).

- Option 4.3 (Procure Transfer Capacity at a Private Transfer Station in Vicinity of the Port Lands Area ) assumes that a private sector waste transfer station with the capacity to accommodate waste from City of Toronto already exists within proximity of the Port Lands area. Currently established and operating private transfers stations within this area are not specifically known to the City, but may exist. An inventory of such facilities and their ability to accept waste from the City needs to be established. In the event a private waste transfer facility does not exist in the Port Lands area, the interest of the private sector to develop and operate a transfer station in the area to serve the City could be assessed. In this case, the score for this option would be the same as for Option 4.1, since it would be essentially the same as developing a new transfer station.

Based on the application of the approved evaluation criteria and utilizing priorities where applicable, the following options are recommended for implementation in the future.

Table 7-8: Recommended Commissioners Street Transfer Station Options

| Option 4.3:<br>Procure Transfer Capacity at a Private Transfer Station in Vicinity of the Port Lands Area |
|---|
| The City would procure transfer capacity at a private transfer station located in the vicinity of the Port Lands Area. Private sector transfer station options are already approved and operating within the City; other facilities may be developed in response to a City identified need. Private transfer stations, existing or to be developed, are expected to have the capacity to manage garbage, primarily collected from multi-residential buildings in the downtown core. Drop-off facilities provided at Commissioners facility currently will be provided at a separate City location. |
| **Option 4.1:<br>Relocation of Transfer Station within the Port Lands Area or Designation of Land for Long-Term Relocation** |
| Construct and operate a new waste transfer facility at a new site located within the Port Lands area or designate land in the area for development as a transfer station in the future. Depending on the timeframe for redevelopment occurring within the Port Lands, relocation could occur within the short term or land may be designated and held for future use as a transfer station over a longer time period. It is anticipated that waste generation will continue to increase in the downtown core as a result of continued development and intensification, supporting the ongoing need for waste transfer capabilities in the area.<br><br>NOTE: The proposed *Waste-Free Ontario Act* could have a significant impact on how waste is managed in the future in the City of Toronto. The City will need to assess potential transfer capacity implications of these changes once more is understood about the new legislation. |

Based on an initial review of known waste transfer locations in the vicinity of the Port Lands area, it appears that Option 4.3 is not a currently available option for future consideration. As a result, Option 4.1 is being recommended for implementation. For more details on the option evaluation process, please refer to Technical Memorandum No. 4[32].

The following provides a summary of the Objectives, Benefits, Performance Expectations, Timeline and Implications of implementing this recommendation.

### 7.4.3 Commissioners Street Transfer Station - Primary Objectives and Benefits

The following provides an overview of the primary objectives and benefits of proceeding with the implementation of this recommendation:

- Continues existing level of service provided by the City.
- Maintains potential user's familiarity with location and services available.
- Provides a convenient option for waste drop-off from downtown customer base.
- Ensures transfer station is compatible with local land uses and traffic patterns.

[32] http://www1.toronto.ca/wps/portal/contentonly?vgnextoid=98fc8005b7ae7410VgnVCM10000071d60f89RCRD

- Supports and services continuing development growth in the downtown area as new multi-residential buildings are built.
- Provides potential to incorporate designs for an enhanced drop off depot for residents.
- Provides access for a full range of divertible and residual garbage management options for waste collection vehicles and potentially small commercial haulers and residential customers.

### 7.4.4 Commissioners Street Transfer Station - Proposed Timeline for Implementation

The following provides an overview of the proposed timeline for implementation over the next 10 years:

**Table 7-9: Commissioners Street Transfer Station Recommendations – Proposed Timeline for Implementation**

| Recommended Options for Implementation | Q3/Q4 | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 | 2023 | 2024 | 2025 | 2026 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Option 4.1: Relocation of Transfer Station within the Port Lands Area or Designation of Land for Long-Term Relocation | | | | | | | | | | | |

Planning ■ Implementation ■ Maintain & Monitor ■

### 7.4.5 Commissioners Street Transfer Station - Long Term Implementation and Operational Considerations

By 2026, these recommendations should be fully implemented and operational. There are no additional Waste Transfer options currently being recommended for implementation post 2026.

## 7.5 Waste Recycling & Processing

The City provides recycling and processing services for the materials that it collects through either its own facilities or contracts with private sector facilities. The two largest waste streams serviced are Blue Bin materials and Green Bin organics processing. Other waste streams that also require processing include:

- Yard Waste
- Oversized Items and Metals
- Construction, Renovation and Demolition Waste
- Electronics
- Used Tires
- Household Hazardous Waste

The following sections discuss recycling and processing recommendations for the future. These options have been classified as "Future Considerations".

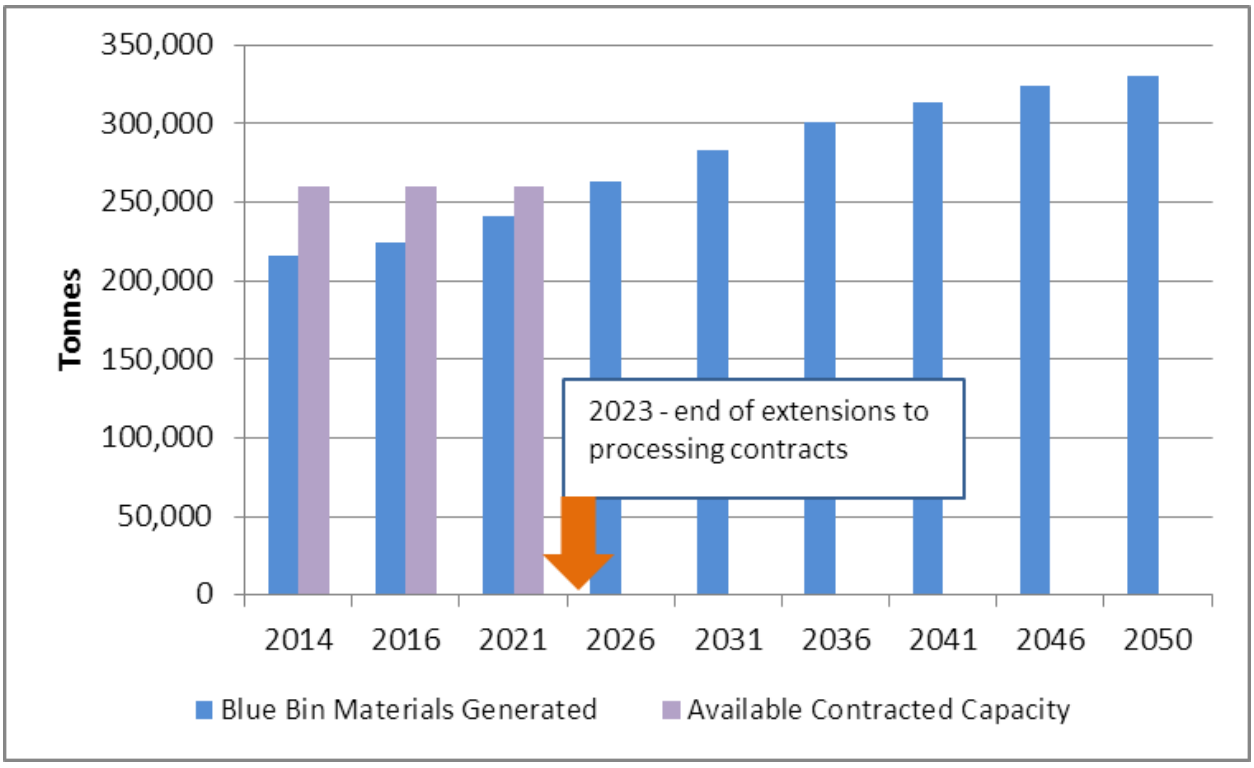
### 7.5.1 Waste Recycling & Processing - Blue Bin Materials

Blue Bin materials are either transported directly to the contracted Material Recovery Facility (MRF) or hauled and consolidated at the closest City transfer station, depending on the location of the collection vehicles. Historically, Blue Bin materials were transported to one of two MRFs in the City; to either the City's now-closed MRF located at the Dufferin Waste Management Facility or to a contracted MRF located on Arrow Road, which is owned and operated by Canada Fibers Ltd. They have been contracted to process all (approximately 260,000 tonnes) of the City's Blue Bin materials annually, broken down into two contracts as follows:

- Contract No. 1 - 110,000 – 140,000 tonnes from 2013 to 2020 with one additional extension of up to two years
- Contract No. 2 - up to 120,000 tonnes from 2014 to 2021 with two one year extensions

The following Figure 7-1 provides an overview of how these contracts compare with the long term projected need for Blue Bin materials processing capacity.

Figure 7-1: Blue Bin Materials Projections and Contract Alignment




As is evident from the figure, the City currently has sufficient capacity in its current Blue Bin materials processing contracts to manage the projected quantities up to 2023.

The following provides some commentary and an overview of recommendations with respect to managing this capacity shortfall.

Commentary

These contracts align well with the anticipated timelines for the new proposed *Waste-Free Ontario Act* legislation which will likely change how Blue Bin materials are managed in the future in Ontario.

Recommendation

As a future consideration, the following is recommended with respect to Blue Bin materials processing capacity in the future:

- It is recommended that the City not make any investments with respect to long-term Blue Bin materials processing capacity until the specific details of the proposed *Waste-Free Ontario Act* legislation are better understood and the future role of the City is more clearly defined.

### 7.5.2 Waste Recycling & Processing - Green Bin Organics Processing

As part of implementation of the Green Bin organics program, the City initiated the development of a facility to process the Green Bin organics collected from residential and non-residential sources. The first facility was located at the Dufferin Waste Management Facility, utilizing anaerobic digestion technology. This technology was chosen for its ability to process a complex organics stream, to allow for the use of plastic bags as liners in order to make the program as convenient as possible for residents and to capture materials such as diapers and sanitary waste.

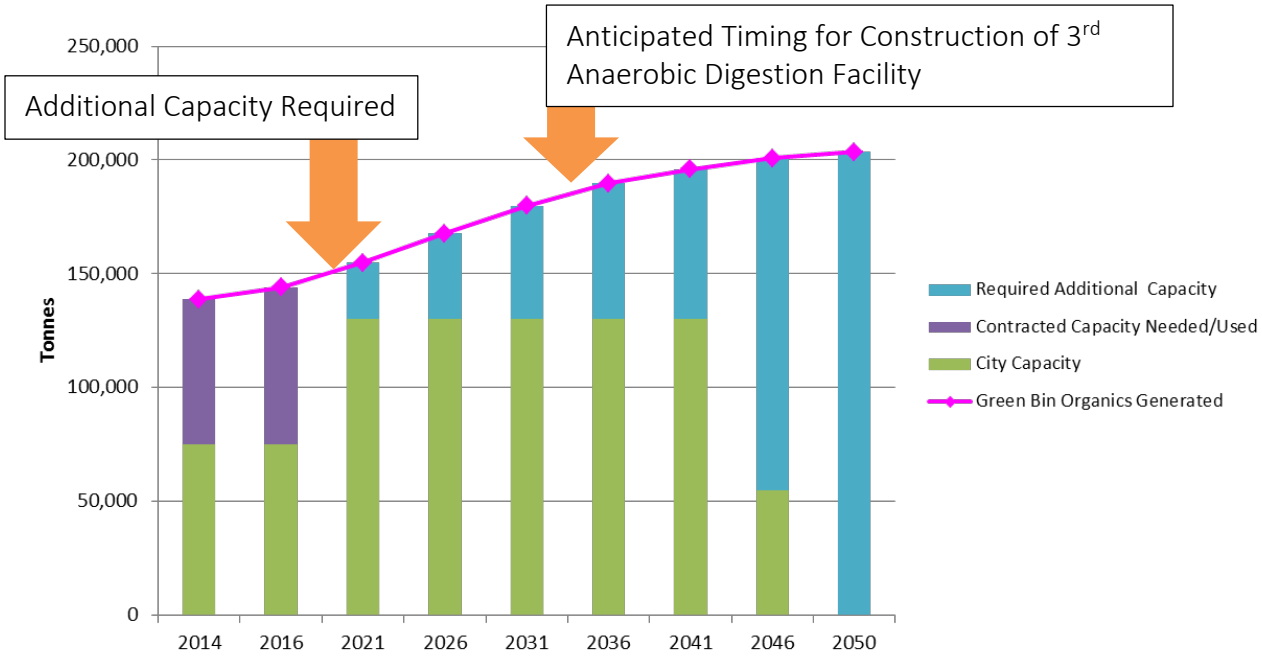
As the Green Bin organics program expanded, additional processing capacity was required. In May 2007, Council authorized the design and development of two organic processing facilities in Toronto. This authorization included a new facility at the Disco Road Waste Management Facility and an expanded facility at the Dufferin Waste Management Facility. Once the expanded Dufferin Anaerobic Digestion Facility is operating (expansion anticipated to be complete in 2018), these two facilities will have a combined processing capacity of approximately 130,000 tonnes per year.

In addition to the City's own organics processing capacity, it has also secured several processing contracts with private sector operators, including:

- Contract No. 1 - 37,500 tonnes renewed in May 2015 for three years with two, one year extensions
- Contract No. 2 - 37,500 tonnes renewed in May 2015 for three years with two, one year extensions
- Contract No. 3 - 10,000 tonnes expires in 2017 with two, one year extensions

These contracts are in place to provide contingency capacity and processing capacity while facilities are built. The following Figure 7-2 provides an overview of how these contracts compare with the long-term projected need for organics processing capacity.

Figure 7-2: Organics Processing Projections and Contract Alignment




Based on the current facilities and private sector contracts, the City will not have sufficient organics processing capacity to manage its projected needs in 2020.

The following provides some additional details and an overview of recommendations with respect to managing this future capacity requirement.

<u>Commentary</u>

There are currently a number of variables with respect to Green Bin organics processing requirements, including:

- Given the quantities of organics requiring management in 2020 and forecasted out into the future, in order to build a third Anaerobic Digestion facility of similar size to the new Disco Organics Processing Facility (75,000 tonnes per year), the City will not have sufficient quantities of organics required for another 10 to 15 years to support this investment.
- The City is also currently planning the rollout of a larger Green Bin to single family residential customers that could also impact the quantities of material requiring management. Should this program modification result in additional tonnes requiring

management, additional processing capacity may be required in the system earlier than currently projected.

- As part of the new proposed *Waste-Free Ontario Act,* the Province of Ontario is considering a ban on organics disposal in the future. The implementation of this type of ban could have significant implications on the demand for Green Bin organics processing capacity in the Province.
- As part of the draft Waste Strategy, a recommendation has been proposed to implement a food waste reduction strategy (see Section 7.2.2 above). The successful implementation of this strategy will reduce the amount of Green Bin organics requiring management and therefore should reduce the need for additional organics processing capacity.

Recommendations

The following is recommended with respect to Green Bin organics processing capacity in the future:

- It is recommended that the City monitor the success of the Food Waste Reduction Strategy recommended for early implementation in this draft Waste Strategy to determine its potential impact on long-term organics processing capacity requirements.
- It is recommended that the City monitor closely the discussions on a potential organics ban in Ontario and the potential implications to the City as it relates to:
    - Ability to secure long-term private sector organics processing capacity; and
    - Need and/or opportunity to construct new organics processing capacity in the City.
- The next steps in implementing the recommended Mixed Waste Processing with Organics Recovery Facility Development[33] should take into account the potential need for long-term organics processing capacity. This could include investigating opportunities to co-manage similar organic waste streams.

### 7.5.3 Waste Recycling & Processing - Other Processing Requirements

Through the review of the system and development of this draft Waste Strategy, no additional gaps, challenges or opportunities were identified with respect to the following that haven't already been addressed in other sections of this document:

- Yard Waste Processing
- Oversized Items and Metals Processing
- Construction, Renovation and Demolition (CRD) Waste Processing
- Electronics Processing
- Waste Tire Processing
- Household Hazardous Waste Processing

[33] See Section 7.6.2 for additional information on the recommended recovery option.

It is important to note that the proposed *Waste-Free Ontario Act*[34] will impact a number of these programs in the future and the City should engage in development of this legislation to the extent possible and understand its potential impacts on these programs and services in the future.

### 7.5.4 Waste Recycling & Processing - Future of Dufferin Material Recovery Facility

A Gap, Challenge and/or Opportunity identified early in the system review process relates to the future of the now closed (closed in November 2014) Material Recovery Facility (MRF) at the Dufferin Waste Management Facility. Specifically, this facility was identified as a potential candidate for several alternative uses depending on what is recommended in the draft Waste Strategy. Based on a preliminary review, it is confirmed that this site may be considered suitable for implementation of this option and should be considered further as the implementation is completed and as part of a facility siting process.

## 7.6 Materials & Energy Recovery

Following the reduction, reuse and recycling of materials, there are opportunities to recover valuable resources from the waste that remains. These resources could be in the form of additional, hard to capture, recyclables such as metals (mixed with other materials), organics or energy resources including gas and heat.

A Landfill Gas/Biogas Utilization Study was completed for the City of Toronto in 2015. The study investigated utilization options for landfill gas/biogas generated at Green Lane Landfill, the expanded Dufferin Organics Processing Facility and the new Disco Road Organics Processing Facility. Options examined as part of the study included using the gas to produce electricity, renewable natural gas, or other viable alternative utilization options. Currently none of these facilities are utilizing the gas that is being recovered for energy generation purposes.

For more information on waste recovery services provided by the City, please refer to Technical Memorandum No. 1[35].

### 7.6.1 Materials & Energy Recovery - Rationale & Importance

A challenge facing the City is diminishing landfill disposal capacity. Alternative processing technologies could divert additional materials from disposal and extend the life of Green Lane Landfill. Another challenge facing the City is the need for increased waste diversion in the multi-residential sector to support its diversion goals, and reduce the amount of material currently being landfilled. Based on these specific challenges a range of options were considered, including:

[34] See Section 10.2.1 for additional information on the Draft *Waste-Free Ontario Act*.

[35] http://www1.toronto.ca/wps/portal/contentonly?vgnextoid=98fc8005b7ae7410VgnVCM10000071d60f89RCRD

- Option 6.1: Mixed Waste Processing Facility Development
- Option 6.2: Mixed Waste Processing with Organics Recovery Facility Development
- Option 6.3: Direct Combustion Facility Development
- Option 6.4: Emerging Technologies Facility Development
- Option 6.5: Organics Recycling Biocell or Biomodule Development
- Option 6.6: Refuse Derived Fuel Facility Development
- Option 6.7: Waste to Liquid Fuel Technologies Facility Development

### 7.6.2 Materials & Energy Recovery - Recommended Option for Implementation

The comparative evaluation process applied a number of evaluation criteria to each option. The criteria were organized into three categories representing the three fundamental pillars of sustainability (Environmental, Social and Financial) and supported a triple bottom line analysis of each option[36].

Based on the application of the approved evaluation criteria and utilizing priorities where applicable, the following option is recommended for implementation in the future.

Table 7-10: Recommended Recovery Option

| Option 6.2:<br>Mixed Waste Processing with Organics Recovery Facility Development |
|---|
| Mixed Waste Processing with Organics Recovery is a combination of mechanical materials recovery and either mixed waste composting or anaerobic digestion (AD) as a subset technology. This option involves consideration of the development of a Mixed Waste Processing with Organics Recovery facility which would receive a mixed waste stream for mechanical processing followed by composting/digestion. This option is intended to support an increase in the overall waste diversion achieved and to extend the life of Green Lane Landfill.<br><br>NOTE: The proposed *Waste-Free Ontario Act* considers different approaches to recycling related services. The City will need to better understand the potential implications of this new legislation on this option, prior to its implementation. |

When compared to the other options, Mixed Waste Processing with Organics Recovery scored the same or relatively better in the environmental category as it had a greater potential to benefit the local and regional/global environment through energy generation and greenhouse gas reduction and also had the ability to divert a larger amount of waste when compared to the other options. The options evaluated had relatively similar social scores as these options would all require the construction of a new facility with similar associated impacts to the community. From a financial perspective, the Mixed Waste Processing option scored much higher than the

[36] See Technical Memorandum No. 3 – Options Identification and Evaluation Process and Technical Memorandum No. 4 for a description of the evaluation process and Technical Memorandum No. 4 – Detailed Evaluation of Options.

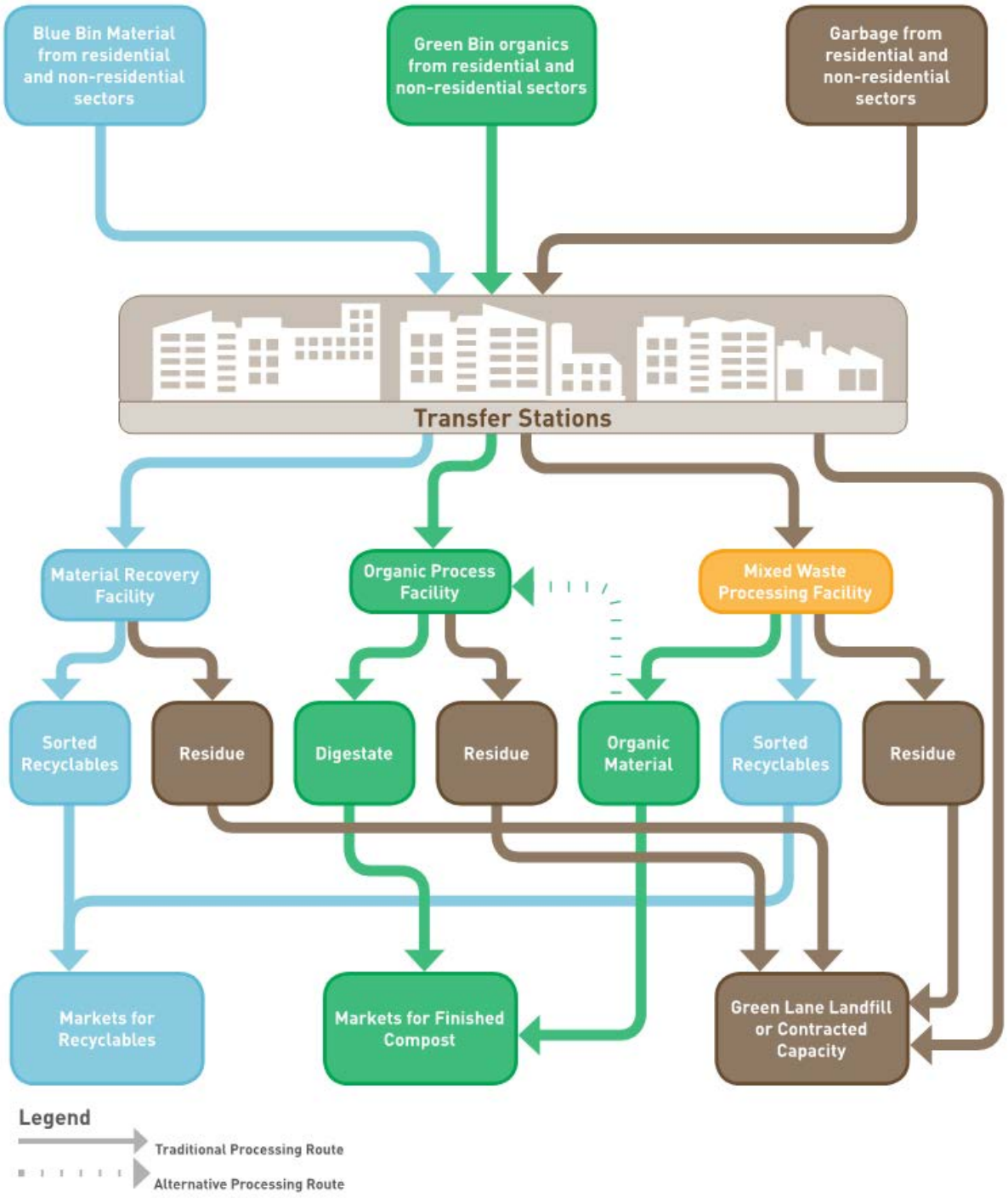
alternatives primarily as they are considered a lower cost option with similar to greater opportunities for economic growth and local job creation.

Additional Commentary on the Evaluation:

- Option 6.5: Organics Recycling Biocell or Biomodule also scored high in the evaluation and should be considered a future consideration with respect to an alternative approach to the organics recovery component of the recommended Mixed Waste Processing with Organics Recovery option.
- Several of the other options not currently being recommended for implementation could still prove to be valuable components for the future integrated system. These options including: 6.4 Emerging Technologies; 6.6 Refuse Derived Fuel; and, 6.7 Waste to Liquid Fuels which are all technologies that could manage the residual materials coming from the Mixed Waste Processing facility and could be added to the integrated waste management system following successful implementation of the recommended option.

The following Figure 7-3 provides a graphic showing how the recommended recovery option would be integrated with the rest of the waste management system.

Figure 7-3: Mixed Waste Processing Facility Integration



The following provides a summary of the Objectives, Benefits, Performance Expectations, Timeline and Implications of implementing this recommendation.

### 7.6.3 Materials & Energy Recovery - Primary Objectives and Benefits

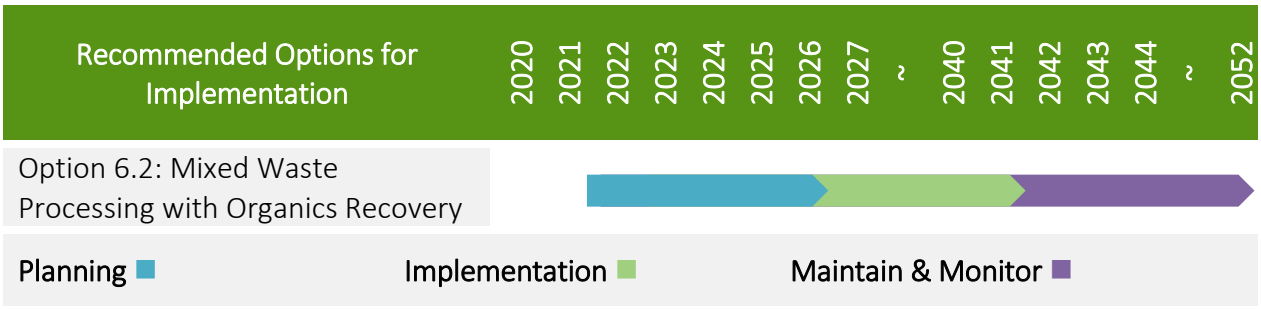
The following provides an overview of the primary objectives and benefits of proceeding with the implementation of this recommendation:

- Potential for an estimated 75,000 additional tonnes diverted from landfill each year (depending on preferred facility size) which is the equivalent of an additional estimated 7-9% annual waste diversion.
- Produces a variety of materials, including those that can be used for energy generation.
- Is flexible to changes in waste quantities and composition.
- Can be coupled with a variety of technologies to generate outputs such as Refuse Derived Fuel (RDF), biogas and compost/digestate. RDF and biogas can be used to generate energy.

### 7.6.4 Materials & Energy Recovery - Proposed Timeline for Implementation

The following provides an overview of the proposed timeline for implementation over the life of the Strategy. This timeline has been developed in a manner that plans for making investments in this option after the first five years of the Waste Strategy implementation to better understand the potential impacts realized through additional 3Rs options combined with a more aggressive stance on enforcement.

Table 7-11: Recovery Recommendations – Proposed Timeline for Implementation




### 7.6.5 Materials & Energy Recovery - Long Term Implementation and Operational Considerations

The total estimated capital cost for this recommendation is $400 - $700 million depending on the size and preferred business arrangement. Based on the proposed approach to implementation, the planning phase (including detailed business case, siting, permitting and approvals, procurement and contract negotiations) starting in 2022, could take eight to 10 years to have all the requirements in place to begin construction. Given this time line, the following is being recommended:

1) Planning for facility development be initiated in 2022;

2) Emphasis be placed on other recommendations for early implementation which have the potential benefit of increasing capture rates for recyclables and organic materials (in particular from multi-residential buildings); and,
3) The performance of the options being recommended for early implementation be reviewed at the first five year interval to determine the timing for this facility in the future. In particular, the greater the success with various recommended programmatic options in the early years could result in a reduced or delayed need for this facility in the future. However, given the lengthy planning process, it is still prudent to start planning for implementation (i.e. construction) to start in 2027-2028.

## 7.7 Residual Waste Disposal

The City owns and operates Green Lane Landfill as its primary facility to manage residual waste. For contingency purposes, the City has also secured contracts with a number of private waste disposal facilities.

For more information on residual waste management provided by the City, please refer to Technical Memorandum No. 1[37].

### 7.7.1 Residual Waste Disposal - Rationale & Importance

A challenge facing the City is to extend the life of Green Lane Landfill and find new garbage disposal opportunities to cover the disposal needs for the 30 to 50 year planning period of the draft Waste Strategy.

In 2014, when the Waste Strategy development process was initiated, the remaining lifespan potential of Green Lane Landfill (GLL) was assessed to be approximately 16 years resulting in an estimated closure date based on the current approved capacity of 2029. This estimate was prepared using the best available data at the time and based on current site operating conditions, estimated annual tonnes to be managed in the future, and an array of other inputs and estimations on future usage by paid private customers, waste generation, and degree of contracting out to other landfills (all of which have been the subject of significant variability over the past several years).

The 2029 estimate was deemed to be an appropriately conservative estimate for both long-term planning and budgeting efforts to ensure that sufficient financial resources would be available at the appropriate time to add additional capacity to manage residual waste into the future and provide for sufficient funding to maintain and monitor GLL once closed.

Over the past two years, through a number of ongoing activities, primarily related to the completion of the draft Waste Strategy, these estimates and assumptions have been revised to

37 http://www1.toronto.ca/wps/portal/contentonly?vgnextoid=98fc8005b7ae7410VgnVCM10000071d60f89RCRD

reflect new data sources that have become available and a more detailed analysis of potential future quantities to be managed. Additionally, trends experienced over the past five years in terms of waste generation and disposal requirements such as the shift towards light weighting of materials/packaging and possibly due to increased use of online media and moving away from print materials (i.e. magazine, books, newspapers etc.) have also impacted the tonnages requiring management at GLL. The following summarizes some of the key findings that have led to a change in the anticipated closure date of GLL from 2029 to 2040.

1. A review of GLL actual operating conditions has revealed a trend that indicates that settlement in the site is occurring at a rate greater than initially estimated. Settlement is a result of continually layering the waste as it is landfilled and as the weight of the material increases, plus waste decomposition, the layers towards the bottom of the site compress, resulting in additional airspace at the top for further landfilling. Settlement is highly dependent on the composition of the waste that is being landfilled and over the past few years, with significant changes in waste composition (in particular lightweighting of packaging), the rate of settlement appears to be increasing. The analysis of this trend suggests that this will continue in the future and is something that should be monitored as it has the potential to further extend the life of the landfill by a number of years.
2. The initial projections of material to be received at the site have been refined as part of the draft Waste Strategy. Based on the introduction of new, more sophisticated modelling, which now includes a correlation to economic growth factors of the City, the estimates of waste disposal requirements have been determined to be lower than originally estimated[38] as a result of a better understanding of potential future customer growth and estimated waste management needs. In other words, although the amount of waste requiring landfill in the future will continue to rise, based on the new projections, it will not increase to the same extent originally envisioned. Therefore, in future years, less landfill capacity will be required annually over what was originally projected.
3. The draft Waste Strategy will be recommending a series of new waste reduction, reuse, recycling, recovery and residual programs and facilities that have the potential to further extend the life of GLL by up to an additional eight to 12 years over the original projections and in addition to the additional capacity described in the two points above.

Based on the above three items and assuming the approval of the components of the draft Waste Strategy as recommended, it estimated that the GLL closure date could be extended to at least 2040. It is also important to note that depending on the requirements of the draft *Waste-Free Ontario Act* and its supporting regulations, these estimates could change, the extent to which is unknown at this time.

[38] For more detailed information on waste quantity projections, please refer to Technical Memorandum No. 2 ( http://www1.toronto.ca/wps/portal/contentonly?vgnextoid=98fc8005b7ae7410VgnVCM10000071d60f89RCRD ).

The following options specific to residual waste management were considered, including:

- Option 7.1: Landfill Expansion
- Option 7.3: Bioreactor Landfill
- Option 7.5: Adjust Tipping Fees or Customer Base
- Option 7.6: Purchase a New Landfill
- Option 7.7a: Secure Disposal Capacity to Preserve Long-term Landfill Capacity at GLL
- Option 7.7b: Secure Disposal Capacity for Residual Management Following GLL Reaching its Approved Disposal Capacity
- Option 7.8: Greenfield Landfill

It should be noted that there were originally two additional options identified as part of Residual Waste Disposal:

Option 7.2: Landfill Mining and Reclamation and,
Option 7.4: Landfill Operation Continuous Improvement and Best Practices.

Both of these options were reclassified as "Future Considerations" to support the implementation of the recommended options.

### 7.7.2 Residual Waste Disposal - Recommended Options for Implementation

The options considered and evaluated include options that can be implemented both in the near term (i.e. over the next 10 years) and over a longer period of time. These options are distinctly different and achieve residual disposal capacity either by extending the life of GLL or by providing new future disposal capacity. Based on the application of the approved evaluation criteria and utilizing the approved evaluation methodology, the identified options are recommended for implementation to address these timelines[39].

*Near Term Options (both these options are recommended for implementation)*

- Option 7.5: Adjust Tipping Fees or Customer Base
- Option 7.7a: Secure Disposal Capacity to Preserve Long-term Landfill Capacity at GLL

*Long Term Options (one or more of these options may be implemented in the long-term depending on disposal requirements and GLL capacity)*

- Option 7.1: Landfill Expansion
- Option 7.6: Purchase a New Landfill

[39] It is important to note that depending on the requirements of the draft *Waste-Free Ontario Act* and its supporting regulations, these estimates could change, the extent to which is unknown at this time.

- Option 7.7b: Secure Disposal Capacity for Residual Management Following GLL Reaching its Approved Disposal Capacity
- Option 7.8: Greenfield Landfill

Based on the application of the approved evaluation criteria and utilizing priorities where applicable, the following options are recommended for implementation in the future.

Table 7-12: Recommended Near Term Residual Waste Options

| Option 7.5:<br>Adjust Tipping Fees or Customer Base |
|---|
| This option considers adjusting tipping fees to discourage acceptance of waste from paid private customers and/or adjust types of customers permitted to use City of Toronto waste facilities. An increase in tipping fees will discourage paid private customers increasing landfill life and potentially decreasing revenues for the City of Toronto.<br><br>NOTE: The proposed *Waste-Free Ontario Act* could have a significant impact on how waste is managed in the future in the City of Toronto. The City will need to assess potential transfer capacity implications of these changes once more is understood about the new legislation. |
| **Option 7.7a:**<br>**Securing Disposal Capacity to Preserve Long-term Landfill Capacity at GLL** |
| This option looks at acquiring/securing residual waste disposal capacity from private/municipal landfill sites or at another facility (e.g. Energy from Waste) in order to preserve long-term landfill capacity at GLL.<br><br>NOTE: The proposed *Waste-Free Ontario Act* could have a significant impact on how waste is managed in the future in the City of Toronto. The City will need to assess potential residual disposal capacity implications of these changes once more is understood about the new legislation. |

Options 7.5 and 7.7a are being recommended primarily as a means to further extend the life of Green Lane landfill. When the City conducts its regular reviews and updates of the Waste Strategy, consideration should be given at that time to the remaining capacity available at Green Lane Landfill, to the timeline to secure new capacity, and to the potential to implement the other identified options to provide additional residual waste disposal capacity in the future.

With respect to Option 7.7a, the City already has contracted capacity to implement this option as follows:

- Contract No. 1 – up to 75,000 tonnes annually expiring in August 2021 with no remaining extensions;
- Contract No. 2 – up to 200,000 tonnes annually expiring in August 2021 with no remaining extensions; and,
- Contract No. 3 – up to 50,000 tonnes annually expiring in August 2021 with no remaining extensions.

These contracts will need to be considered in order to allow for the successful implementation of this option.

The following provides a summary of the Objectives, Benefits, Performance Expectations, Timeline and Implications of implementing this recommendation.

### 7.7.3 Residual Waste Disposal - Primary Objectives and Benefits

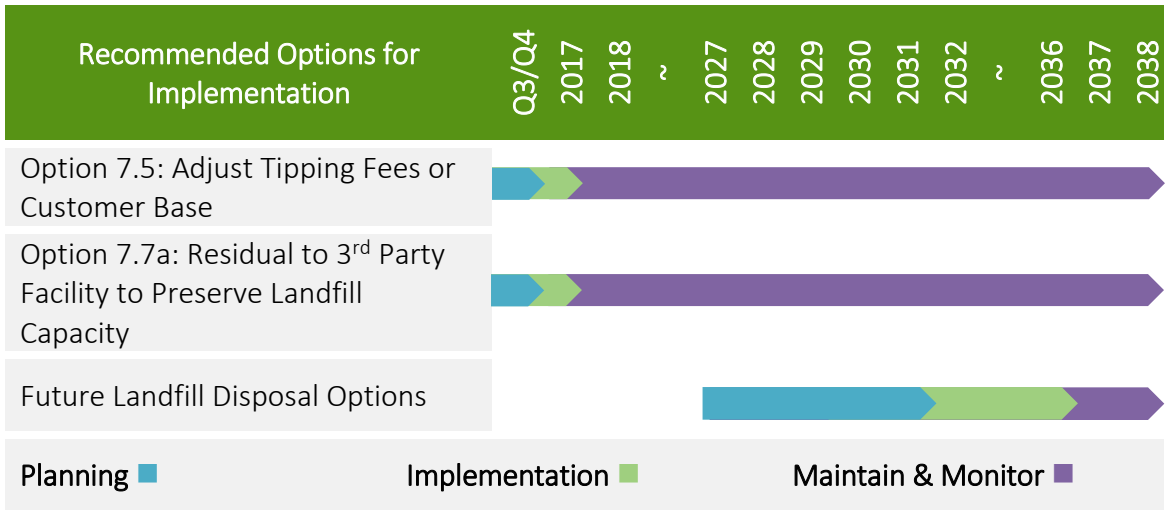
The following provides an overview of the primary objectives and benefits of proceeding with the implementation of this recommendation:

- Estimated 150,000 additional tonnes diverted from Green Lane Landfill each year over the 10 year period[40].
- Anticipated cost savings of approximately $10/tonne by using alternative private sector capacity.
- Preserves long-term disposal capacity by increasing tipping fees for commercial and industrial waste tonnes at GLL and City transfer stations.
- Extends landfill development, operations, closure and post-closure care costs over a longer time period.
- Provides secure access to required disposal capacity over the time period of the contract.

### 7.7.4 Residual Waste Disposal - Proposed Timeline for Implementation

The following provides an overview of the proposed timeline for implementation over the next years of implementation.

**Table 7-13: Residual Waste Recommendations – Proposed Timeline for Implementation**




[40] A minimum or baseline quantity of waste would continue to be disposed and landfilled at Green Lane Landfill to maintain the efficient operation of the landfill. Any amount of waste above the baseline quantity would be directed to another facility.

### 7.7.5 Residual Waste Disposal - Long Term Implementation and Operational Considerations

Four options have been identified for consideration to provide the City with long term residual waste disposal capacity. For each of these options (i.e. Options 7.1 (Landfill Expansion), 7.6 (Purchase a new landfill), 7.7b (Secure disposal capacity once GLL has reached approved capacity), 7.8 (Greenfield Landfill)), the disposal capacity requires the completion of an Environmental Assessment. This will take several years for Options 7.1 and 7.8, which would be undertaken by the City. Options 7.6 and 7.7b require that the disposal capacity be developed by others (although some potential for partnerships may exist) and at this time it is not known to what extent these options will be available to the City in the future. When the City conducts its regular reviews and updates of the Waste Strategy, consideration should be given at that time to the remaining capacity available at Green Lane Landfill and the potential to implement these four long-term residual waste disposal capacity options.

## 7.8 Overall System Recommendations – Multi-residential Services

The City provides solid waste management services (collection of Blue Bin materials, Green Bin organics, garbage, Oversized items, yard waste, Electronics, and Household Hazardous Waste) to multi-residential buildings throughout the City. By City definition[41], multi-residential includes:

- nine or more units and generally include apartments, condominiums and some types of townhouses
- small multi-residential buildings are those that receive curbside waste collection using wheeled curbside bins
- large multi-residential buildings are those facilities that use front-end containers for waste collection

It is important to note that the majority of multi-residential buildings are eligible for City services, however, some have opted-out of receiving this service and elected to retain a private contractor. Therefore, there is a portion of waste that is currently being managed by the private sector that the City does not manage at its facilities nor has control over.

For more information on multi-residential waste services provided by the City, please refer to Technical Memorandum No. 1[42].

### 7.8.1 Multi-residential Services - Rationale & Importance

A number of gaps, challenges and/or opportunities were identified with respect to the provision of waste services to multi-residential customers, including:

[41] Note. These are City definitions according to the City By-Law. Provincial definitions may vary.
[42] http://www1.toronto.ca/wps/portal/contentonly?vgnextoid=98fc8005b7ae7410VgnVCM10000071d60f89RCRD

- Solid Waste Services for the Industrial, Commercial & Institutional (IC&I) Sector: identifying a mechanism to allow the City to influence greater waste diversion in the IC&I sector for waste materials being generated within the City of Toronto, but managed outside the City of Toronto waste management system.
- Multi-residential Waste Diversion: the need for increased waste diversion in the multi-residential sector to support its diversion goals, and reduce the amount of material currently being landfilled.
- Waste Reduction & Reuse: how to better promote and facilitate the reduction and reuse of waste materials to prevent waste from entering the system and requiring management through collection, processing and/or disposal.
- Impacts of Intensification: the impacts of intensification and the changes required to manage additional waste generated by housing units with typically lower waste diversion performance records and in areas that are more difficult to collect using traditional methods. Buildings that do not receive City collection services due to access limitations cannot participate in the variety of waste diversion services offered by the City.
- Enforcement: to maximize the effective and efficient use of its current programs, services and facilities. To date, significant effort and success has been realized through promotion and education; however, there are still areas of the system where performance is not at the desired level requiring strategic consideration and engagement of enforcement measures.

The gaps, challenges and/or opportunities for the multi-residential sector were grouped into three main categories: organics management, waste collection methods and planning, policies and enforcement. Based on these specific challenges identified for these groupings, a range of options were considered including:

### Organics Management

- Option 2.7: Community or Mid-Scale Composting
- Option 5.1: On-Site Organics Processing
- Option 5.2: In-Sink Disposal Units

### Waste Collection Methods

- Option 9.1: Elimination of Collection Service to Multi-residential Buildings
- Option 3.1: Container Management
- Option 3.2a: Alternative Collection Methods for Multi-residential Buildings - One Container System
- Option 3.2b: Alternative Collection Methods for Multi-residential Buildings - Vacuum System
- Option 3.7: Multi-residential Collection using Alternative Vehicles

### Planning, Policies and Enforcement

- Option 1.8: Multi-residential by-laws and Enforcement

- Option 1.9: Updates to Current Multi-residential Development Standards

### 7.8.2 Multi-residential Services - Recommended Options for Implementation

The comparative evaluation process applied a number of evaluation criteria to each option. The criteria were organized into three categories representing the three fundamental pillars of sustainability (Environmental, Social and Financial) and supported a triple bottom line analysis of each option[43].

Based on the application of the approved evaluation criteria and utilizing priorities where applicable, the following options are recommended for implementation in the future.

Table 7-14: Recommended Multi-residential Services Options

| Organics Management |
|---|
| **Option 2.7: Community/Mid-Scale Composting** |
| Consider composting operations in locations where community members can compost their garden or kitchen waste using low-technologies such as a large backyard composter or a three-bin wooden composter. Organic waste collection bins could be located at different participating sources, e.g., religious institutions, community gardens etc. Collected waste would be dropped off to the community composting area. Final compost could be used in community gardens or local landscaping needs. |

| Waste Collection Methods |
|---|
| **Option 3.1: Container management** |
| Use new or modern technology for more efficient container management, such as live tracking of waste, recycling and/or organic waste container volumes, to better manage collection needs particularly in multi-residential buildings. A waste tracking technology, such as radio frequency identification (RFID), could be used with existing and new bins to provide data and statistics for each multi-residential building (e.g. weight of materials collected could be used to calculate diversion rates and potentially optimize collection frequency thereby reducing the number of collection trips in a given week). The City could require that the technology be used at properties that receive collection either through the City (through municipal or private collection forces) or investigate this as a future requirement for all multi-residential buildings in the City. |

| Planning, Policies and Enforcement |
|---|
| **Option 1.8: Multi-residential by-laws and Enforcement** |
| City to consider increasing enforcement efforts of existing applicable waste diversion by-laws and/or enacting new, legally permissible by-laws to mandate City-wide waste diversion requirements (Blue Bin |

[43] See Technical Memorandum No. 3 – Options Identification and Evaluation Process and Technical Memorandum No. 4 for a description of the evaluation process and Technical Memorandum No. 4 – Detailed Evaluation of Options.

| Option 1.8:<br>Multi-residential by-laws and Enforcement |
|---|
| materials and Green Bin organics service, etc.) to all multi-residential buildings. For enforcement, focus is on more effective enforcement of existing City by-laws that apply to multi-residential customers and/or exploring joint enforcement efforts with the Province regarding O. Reg. 103/94 requirements. For potentially enacting new by-laws, the goal would be mandating diversion at the building level (with building owners responsible) and/or through mandatory requirements for haulers operating within the City and servicing multi-residential buildings. Enactment of the proposed *Waste-Free Ontario Act* and subsequent adoption of regulations under the Act might affect this analysis.<br><br>NOTE: The proposed *Waste-Free Ontario Act* could have a significant impact on how waste is managed in the future in the City of Toronto, including for multi-residential buildings. The City will need to assess potential legal and technical implications of these changes once more is understood about the new legislation. |
| **Option 1.9:<br>Updates to Current Multi-residential Development Standards** |
| City of Toronto would review and revise where appropriate, the multi-residential development standards and introduce new requirements such as common area drop-off depot requirements or flexible space requirements to allow for the addition of future programs. New standards could require that space be set aside for drop-off depots, space for sharing libraries and modifications to loading space in order to allow for collection by smaller vehicles.<br><br>NOTE: The proposed *Waste-Free Ontario Act* could have a significant impact on how waste is managed in the future in the City of Toronto. The City will need to assess potential legal and technical implications of these changes once more is understood about the new legislation. |

The following provides a summary of the Objectives, Benefits, Performance Expectations, Timeline and Implications of implementing this recommendation.

### 7.8.3 Multi-residential Services - Primary Objectives and Benefits

The following provides an overview of the primary objectives and benefits of proceeding with the implementation of these recommendations:

- Estimated 120,000 additional tonnes diverted from landfill over the 10 year period.
- Estimated approximately 2 - 3% increase in waste diversion overall for the City.

#### Organics Management

- Provides an opportunity to encourage community composting programs.
- Creates opportunities for community engagement and education on the value of composting.
- Produces compost that can be used in other community projects, such as community gardens, creating a closed-loop system.

#### Waste Collection Methods

- Can provide building-specific data on waste management performance and increase accessibility for on-demand billing information.
- Potential for reduction in collection costs (less trucks, fuel, labour) and traffic congestion associated with standard waste collection routes and schedules.
- Allows for the capability to monitor waste material generation.

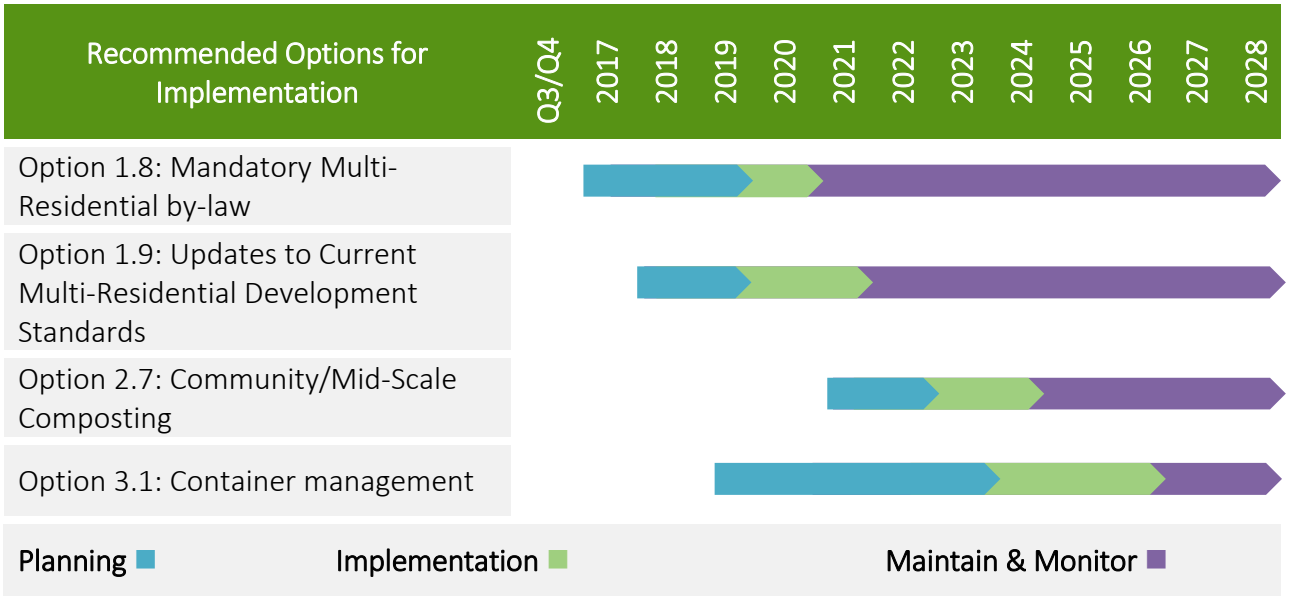
**Planning, Policies and Enforcement**

- City measures would ideally complement the existing or newly proposed Provincial regulations.
- Introduces a level playing field whereby diversion services would be in place for all multi-residential customers regardless of the service provider thereby ensuring environmental sustainability.
- Toronto continues its role as a leader in waste diversion programs and services.
- Could possibly encourage buildings to come back on to City collection services, increasing the customer base and revenue. Exploring joint Provincial/municipal enforcement of O.Reg. 101/94.

### 7.8.4 Multi-residential Services - Proposed Timeline for Implementation

The following provides an overview of the proposed timeline for implementation over the next Seems too high. ~10 TN is 1% years of implementation.

Table 7-15: Multi-residential Recommendations – Proposed Timeline for Implementation



### 7.8.5 Multi-residential Services - Long Term Implementation and Operational Considerations

By 2028, these recommendations should be fully implemented and operational. There are no additional multi-residential services options currently being recommended for implementation post 2026.

## 7.9 Overall System Recommendations – Industrial, Commercial & Institutional Services

The City provides some waste management services to a limited number of Industrial, Commercial and Institutional (IC&I) facilities. Typically the facilities receiving service are defined as "Commercial", and are:

- generally less than four floors and less than 500 square metres of ground floor space.
- must be eligible for and subscribe to the City's Yellow Bag program.

In addition to the waste materials managed by the City, a substantial quantity of waste from the IC&I sector is privately managed by the private sector outside of the City of Toronto system.

Although the City is not obligated or mandated to provide waste management services to the IC&I sector, a portion of the waste stream generated by these sectors could potentially require management by the City under certain circumstances, in particular where IC&I buildings and residential customers are combined (Residential Unit Above Commercial ). A discussion of privately managed waste is included in Technical Memorandum No. 1[44] in order to provide a complete picture of the waste currently managed within the City's geographic boundaries and other sources of waste which the City may either manage, or have some influence over in the future.

### 7.9.1 Industrial, Commercial & Institutional Services - Rationale & Importance

A challenge facing the City is to provide the IC&I sector with options which promote greater diversion and are flexible to accommodate changing waste streams and customer accessibility. Another challenge is identifying a mechanism to allow the City to influence greater waste diversion in the IC&I sector for waste materials being generated within the City of Toronto, but managed outside the City of Toronto waste management system. This challenge will be addressed to some extent with future Provincial regulations anticipated over time under the proposed *Waste-Free Ontario Act*. Based on these specific challenges a range of options were considered, including:

- Option 9.3: Expand City of Toronto Share of IC&I Waste Management Market to Provide Diversion Opportunities to More Commercial Businesses in City of Toronto[45]
- Option 9.4: City Explores Mandatory Approaches to IC&I Waste Diversion
- Option 9.5: City of Toronto Exits the IC&I Waste Management Service Business to Simplify its Service Offering and Potentially Preserve Landfill Capacity

[44] http://www1.toronto.ca/wps/portal/contentonly?vgnextoid=98fc8005b7ae7410VgnVCM10000071d60f89RCRD
[45] See Technical Memorandum No. 4 – Detailed Evaluation of Options for a description of eligible establishments. -

### 7.9.2 Industrial, Commercial & Institutional Services- Recommended Options for Implementation

The comparative evaluation process applied a number of evaluation criteria to each option. The criteria were organized into three categories representing the three fundamental pillars of sustainability (Environmental, Social and Financial) and supported a triple bottom line analysis of each option[46].

Based on the application of the approved evaluation criteria and utilizing priorities where applicable, the following options are recommended for implementation in the future.

Table 7-16: Recommended Industrial, Commercial and Institutional Options

| Option 9.3:<br>Expand City of Toronto Share of IC&I Waste Management Market To Provide Diversion Opportunities to More Commercial Businesses in City of Toronto |
|---|
| The City currently provides IC&I waste collection service to commercial businesses on City collection routes, and provides disposal options at City transfer stations, as well as at Green Lane Landfill. For waste collected at curbside, IC&I waste collection is financed through the waste utility. Eligible commercial establishments pay for garbage collection and disposal through the Yellow Bag program, and receive Green Bin organics and Blue Bin materials collection at no additional cost. At transfer station facilities and at Green Lane Landfill, IC&I customers are charged a tipping fee on a cost per tonne basis. In this option, the City would expand the number of commercial businesses that are eligible for City collection in order to provide Green Bin organics and Blue Bin materials collection to these businesses that may not have the opportunity to participate due to current eligibility requirements. All City IC&I customers would be required to also participate in Green Bin and Blue Bin service, thus increasing diversion in the IC&I sector.<br><br>NOTE: The proposed *Waste-Free Ontario Act* could have a significant impact on how waste is managed in the future in the City of Toronto. The City will need to assess potential legal and technical implications of these changes once more is understood about the new legislation. |
| **Option 9.4:**<br>**City Explores Mandatory Approaches to IC&I Waste Diversion** |
| The City considers whether IC&I waste diversion can occur more effectively through a combination of legally permissible City-wide mandatory recycling by-laws, other incentives or disincentives, and/or joint enforcement efforts with the Province. It should be noted that some IC&I establishments are supposed to source separate and divert waste under current regulations, but new regulations are expected in the next few years under the proposed *Waste-Free Ontario Act*.<br><br>NOTE: The proposed *Waste-Free Ontario Act* could have a significant impact on how waste is managed in the future in the City of Toronto. The City will need to assess potential legal and technical implications of these changes once more is understood about the new legislation. |

[46] See Technical Memorandum No. 3 – Options Identification and Evaluation Process and Technical Memorandum No. 4 – Detailed Evaluation of Options.

The following provides a summary of the Objectives, Benefits, Performance Expectations, Timeline and Implications of implementing this recommendation.

### 7.9.3 Industrial, Commercial & Institutional Services - Primary Objectives and Benefits

The following provides an overview of the primary objectives and benefits of proceeding with the implementation of these recommendations:

- Estimated 30,000 additional tonnes diverted from landfill over the 10 year period.
- Ensures that IC&I diversion occurs for all IC&I accounts directly serviced by the City.
- Increases IC&I waste diversion as City has more control over IC&I accounts and can provide Blue Bin and Green Bin diversion at cost competitive prices, particularly to small commercial businesses.

### 7.9.4 Industrial, Commercial & Institutional Services - Proposed Timeline for Implementation

The following provides an overview of the proposed timeline for implementation over the next 10 years.

Table 7-17: IC&I Recommendations – Proposed Timeline for Implementation

| Recommended Options for Implementation | Q3/Q4 2017 | 2018 | 2019 | 2020 | 2021 | 2022 | 2023 | 2024 | 2025 | 2026 |
|---|---|---|---|---|---|---|---|---|---|---|
| Option 9.3: Expand City of Toronto Share of IC&I Waste Management Market | | | | | | | | | | |
| Option 9.4: City Implements IC&I Waste Diversion Policies | | | | | | | | | | |

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### 7.9.5 Industrial, Commercial & Institutional Services - Long Term Implementation and Operational Considerations

By 2026, these recommendations should be fully implemented and operational. There are no additional IC&I options currently being recommended for implementation post 2026.

## 7.10 Overall System Recommendations – Construction, Renovation & Demolition Services

The City provides limited waste management services for Construction, Renovation & Demolition (CRD) materials. Typically these waste materials are managed by the private sector outside of the City of Toronto waste management system.

Although the City is not obligated or mandated to provide waste management services to the CRD sector, a portion of the waste stream generated by these sectors could potentially require management by the City under certain circumstances. A discussion of privately managed waste is included in Technical Memorandum No. 1[47] in order to provide a complete picture of the waste currently managed within the City's geographic boundaries and other sources of waste which the City may either manage, or have some influence over in the future.

### 7.10.1 Construction, Renovation & Demolition Services - Rationale & Importance

A challenge facing the City is to address residential renovation waste and provide its renovator customers with convenient options which promote greater diversion and are flexible to accommodate changing waste streams and accessibility. Another challenge facing the City is how to better promote and facilitate diversion of Construction, Renovation and Demolition (CRD) materials generated by the CRD sector. To date, since the City is not responsible for managing this material, there has been little pressure placed on the CRD sector by the City to divert and ensure a level playing field for CRD companies. In addition, where the City has tried to implement new diversion programs (e.g. shingles, clean wood, etc.) that could be accessed by the CRD sector, there has been difficulty in finding appropriate markets to make these services viable. Private sector initiatives to construct and operate CRD recycling facilities in the Greater Toronto Area (GTA) have failed due to lack of business as disposal remains the less-costly option. Based on the specific challenges described above, a range of options were considered including:

- Option 10.1: Depots, Processing, and Policies to Divert CRD Waste
- Option 10.2: CRD Waste Disposal Ban

### 7.10.2 Construction, Renovation & Demolition Services - Recommended Options for Implementation

The comparative evaluation process applied a number of evaluation criteria to each option. The criteria were organized into three categories representing the three fundamental pillars of sustainability (Environmental, Social and Financial) and supported a triple bottom line analysis of each option[48].

[47] http://www1.toronto.ca/wps/portal/contentonly?vgnextoid=98fc8005b7ae7410VgnVCM10000071d60f89RCRD
[48] See Technical Memorandum No. 3 – Options Identification and Evaluation Process and Technical Memorandum No. 4 for a description of the evaluation process and Technical Memorandum No. 4 – Detailed Evaluation of Options.

Based on the application of the approved evaluation criteria and utilizing priorities where applicable, the following options are recommended for implementation in the future.

Table 7-18: Recommended Construction, Renovation & Demolition Services Options

| Option 10.1:<br>Depots, Processing, and Policies to Divert CRD Waste |
|---|
| The City would establish dedicated CRD drop-off bins at each transfer station to enable easy diversion of CRD wastes. The drop-off depots would accept materials[49] such as clean wood, drywall, concrete, plastic piping, corrugated cardboard, Metal Items, ceramics and asphalt shingles for a lower tipping fee. Mixed CRD waste would be accepted for a higher fee. The City would be responsible for all aspects of designing, implementing and managing the drop-off bins located within existing transfer stations. The City established contracts to have the materials processed at licensed recycling facilities. The City would hire staff at each transfer station to oversee the CRD drop off depots, ensuring that the waste is properly sorted and help with other diversion programs.<br><br>Alone or in partnership with other municipalities or companies, the City would establish a CRD Waste Processing Facility to process CRD materials for end markets. This would address the current barrier that markets cannot be found for many CRD materials without additional processing. This option assumes that the City will choose to construct a new facility but it could purchase an existing CRD recycling facility and retrofit if necessary, which could potentially expedite the implementation of a CRD diversion program.<br><br>The City would develop policies and legislation as well as provide economic incentives to increase CRD waste diversion in Toronto's CRD industry. These initiatives would be analyzed to determine which were the most appropriate and effective to increase diversion. Toronto would take responsibility for consulting with industry, conducting a cost/benefit analysis on the approaches and developing a communication strategy, implementation plan and schedule. The policies could include mandatory source separation and processing requirements and economic incentives (e.g. differential tipping fees, CRD debris deposit, requirement of proof of recycling to get occupancy permit etc.) to encourage greater reuse and recycling of CRD waste, and use of the drop offs and processing facility.<br><br>NOTE: The proposed *Waste-Free Ontario Act* could have a significant impact on how waste is managed in the future in the City of Toronto. The City will need to assess potential legal and technical implications of these changes once more is understood about the new legislation. |
| Option 10.2:<br>CRD Disposal Ban |
| Toronto would consider phased-in disposal bans on CRD materials at City transfer stations ensuring that well established and stable markets are available for the diverted materials. Bans will affect mostly small CRD companies. The City would work with GTA neighbours to encourage similar bans to ensure material does not get disposed in neighbouring jurisdictions. The bans would begin with a 10% contamination threshold and would target CRD wastes for which stable recycling markets exist (clean wood waste, |

[49] Note: Some of these materials are already accepted by the City at existing Transfer Station/Drop-off Locations.

drywall, cardboard, and shingle roofing).

The City would work closely with CRD associations to gather input and help to educate members about the bans. In addition, the City would liaise with Ministry of the Environment and Climate Control (MOECC) to ensure that CRD bans are consistent with those under consideration by the Province at this time, and which are likely to be implemented Province wide over time through regulations under the proposed *Waste-Free Ontario Act*.

NOTE: The proposed *Waste-Free Ontario Act* could have a significant impact on how waste is managed in the future in the City of Toronto. The City will need to assess potential legal and technical implications of these changes once more is understood about the new legislation.

The following provides a summary of the Objectives, Benefits, Performance Expectations, Timeline and Implications of implementing these recommendations.

> *NOTE: The Province of Ontario has announced that it plans to implement material disposal bans over time, through regulations under the proposed Waste-Free Ontario Act. The Draft Strategy which accompanies the Draft Act specifically identifies CRD materials as potential candidates for a Provincial ban. Should the City implement CRD material bans, coordination with the Province would be required.*

### 7.10.3 Construction, Renovation & Demolition Services - Primary Objectives and Benefits

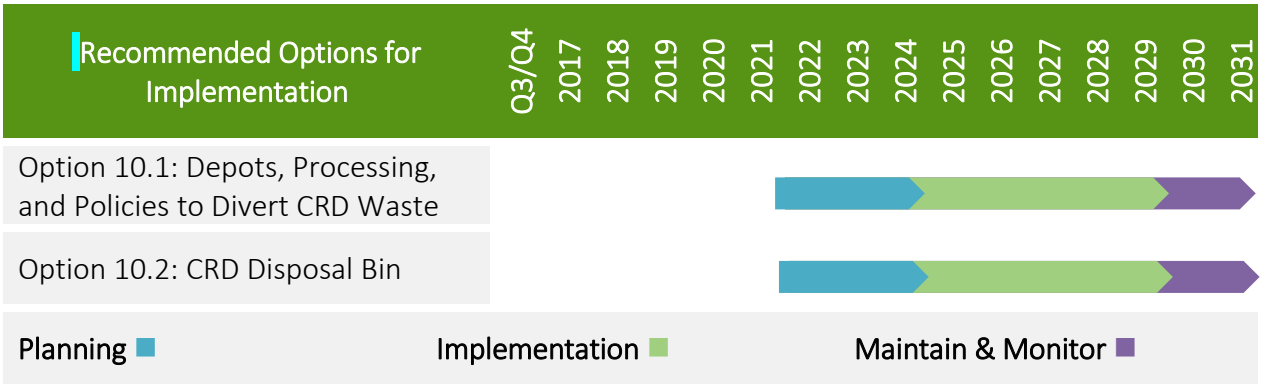
The following provides an overview of the primary objectives and benefits of proceeding with the implementation of these recommendations:

- Helps to increase diversion of easy to recycle CRD materials and helps to generate local jobs.
- Helps to boost existing CRD recycling markets and encourages the development of new markets for materials.
- Provides an opportunity for the City to take a leadership role in developing diversion policies and programs targeting CRD wastes generated by the CRD sector.
- Provides low cost diversion options for home renovators and small to medium renovators.
- Achieves optimal diversion of mixed CRD waste from landfill.

### 7.10.4 Construction, Renovation & Demolition Services - Proposed Timeline for Implementation

The following provides an overview of the proposed timeline for implementation over the next years of implementation.

Table 7-19: CRD Recommendations – Proposed Timeline for Implementation




### 7.10.5 Construction, Renovation & Demolition Services - Long Term Implementation and Operational Considerations

By 2030, these recommendations should be fully implemented and operational. There are no additional CRD options currently being recommended for implementation post 2026.

## 7.11 Overall System Recommendations – Incentive Based Options

For many years, the City's solid waste management services were funded directly through property taxes; however, in 2008, the City implemented a volume-based rate system. This change provided SWMS with greater flexibility to raise the funds required to invest in the integrated waste management system envisioned in the Target 70 process.

User fees for residential customers (single-family and multi-residential) are offset by a property tax supported rebate amount. This rebate is necessary to adjust for the assessed property tax charges that the City must continue to allocate for SWMS to comply with current Provincial legislative requirements.

The approach adopted by the City provides flexibility to tailor customer's net charges for solid waste management services based on a volume-based user pay system. This also allows SWMS customers to see, understand, and control the costs of the waste management services they use. However, it is important to note that since the fee is levied against the garbage stream, it has the appearance to some customers that Blue Bin and Green Bin services are free, when in fact the cost of these services is included in the garbage fee. Further, the net rates charged to customers are structured to provide economic incentives to encourage specific actions such as greater participation in waste diversion programs.

However, there are other forms of incentives that could be implemented in the future waste management system to help further drive system performance.

For more information on incentives provided by the City, please refer to Technical Memorandum No. 1[50].

### 7.11.1 Incentive Based Options - Rationale & Importance

A challenge facing the City is to provide its customers with convenient options which promote greater diversion and are flexible to accommodate changing waste streams and resident accessibility. One way to address this challenge is to provide incentives that reward particular activities and behaviours.

Based on this specific challenge the following options were considered:

- Option 3.6: Incentive Based Drop-off System (e.g. Reverse Vending Machines (RVMs))
- Option 9.8: Deposit-return System for City of Toronto for Selected Materials

### 7.11.2 Incentive Based Options - Recommended Option for Implementation

The comparative evaluation process applied a number of evaluation criteria to each option. The criteria were organized into three categories representing the three fundamental pillars of sustainability (Environmental, Social and Financial) and supported a triple bottom line analysis of each option[51].

Based on the application of the approved evaluation criteria and utilizing priorities where applicable, the following option is recommended for implementation in the future.

Table 7-20: Recommended Incentive Based Option

| Option 3.6:<br>Incentive Based Drop-off System (e.g. Reverse Vending Machines (RVMs)) |
|---|
| Participation in a drop-off/donation centre is rewarded either through returning cash or coupons from the company/retailer/association/product manufacturer sponsoring the reverse vending equipment.<br><br>NOTE: The proposed *Waste-Free Ontario Act* could have a significant impact on how waste is managed in the future in the City of Toronto. The City will need to assess potential legal and technical implications of these changes once more is understood about the new legislation. |

The following provides a summary of the Objectives, Benefits, Performance Expectations, Timeline and Implications of implementing these recommendations.

[50] http://www1.toronto.ca/wps/portal/contentonly?vgnextoid=98fc8005b7ae7410VgnVCM10000071d60f89RCRD
[51] See Technical Memorandum No. 3 – Options Identification and Evaluation Process and Technical Memorandum No. 4 for a description of the evaluation process and Technical Memorandum No. 4 – Detailed Evaluation of Options.

### 7.11.3 Incentive Based Options - Primary Objectives and Benefits

The following provides an overview of the primary objectives and benefits of proceeding with the implementation of this recommendation:

- Estimated 4,000 to 5,000 additional tonnes diverted from landfill over the 10 year period which is the equivalent of an additional estimated 1% annual waste diversion.
- Provides direct and immediate incentive to residents who participate.
- Provides potential for partnerships and agreements with take back agencies and other organizations responsible for the materials which might be captured.
- Encourages higher participation and potentially slightly higher diversion rates for targeted materials.
- Facilitates opportunity to trial innovative technology and incentive approach.
- Provides a visual reminder to support the City's commitment to waste diversion to residents and visitors.

### 7.11.4 Incentive Based Options - Proposed Timeline for Implementation

The following provides an overview of the proposed timeline for implementation over the next 10 years.

Table 7-21: Incentive Based Options – Proposed Timeline for Implementation

| Recommended Options for Implementation | Q3/Q4 | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 | 2023 | 2024 | 2025 | 2026 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Option 3.6: Incentive based drop off system (e.g. reverse vending machines) | | | | | | | | | | | |

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### 7.11.5 Incentive Based Options - Long Term Implementation and Operational Considerations

By 2026, this recommendation should be fully implemented and operational. There are no additional Incentive Based options currently being recommended for implementation post 2026.

## 7.12 Overall System Recommendations – Research, Development and Innovation

Through the consultation process, the concept of a Research, Development and Innovation Unit (RDI Unit) within SWMS was identified as a potential means to advance new, innovative ideas promoting resource conservation, including waste, with potential collaboration with water, and energy stakeholders. The RDI Unit could help to develop and promote new markets for recyclable materials and could include an Economic Development and Green Sector Market Acceleration Program to support innovation and commercialization by local green companies.

The RDI Unit would work to develop partnerships and could also facilitate training. This draft Waste Strategy component was identified as Implementation Tool "Option 9.13: Research, Development and Innovation Unit".

Potential Considerations and Outcomes associated with this option include:

Considerations:

- Potential creation of green jobs and circular economy development opportunities.
- Toronto could use the RDI Unit to promote other environmental programs where Toronto is known to be a leader.
- Offers a central unit to promote community partnerships and collaboration, circular economy, promotion and education.
- Up-front investment is unknown and dependent on potential partnership arrangements.
- Needs up-front effort to establish partnerships and funding support.
- A comprehensive business case will be required to support the development of the RDI Unit and the associated resourcing requirements.
- Need to identify suitable performance measures to determine success.
- Determine what environmental issues will be featured and services to be offered (e.g. research, funding, education, training and networking).
- Support innovation and commercialization by local green companies and organizations through partnering on applied research and proof of concept pilots.

Potential Outcomes:

- Research and potential development of new waste diversion technologies.
- Promotion of innovative ideas.
- Development of waste diversion and environmental training and education programs.
- Established and well formed partnerships.

It is recommended that this option be further investigated and, where appropriate, consider how other recommended options or implementation tools could be addressed through the development of this RDI Unit such as a community partnership unit, various pilot programs associated with recommended options, and other research and development type activities. For more information on this option, please refer to Technical Memorandum No. 3[52].

## 7.13 Controls, Bans and Enforcement

The City has enacted a number of by-laws that pertain to solid waste matters, namely Toronto Municipal Code Chapters 548, 604, 629, 841, 844, and 846, along with the Chapters 441 and 442 that address solid waste rates and fees. City enforcement of these by-laws can provide alternative remedies where outreach, education and engagement have not sufficiently achieved the desired performance levels.

[52] http://www1.toronto.ca/wps/portal/contentonly?vgnextoid=98fc8005b7ae7410VgnVCM10000071d60f89RCRD

The City's Municipal Licensing & Standards Division (ML&S) collaborates with Solid Waste Management Services (SWMS) to resolve by-law infractions where required. To a large extent, investigations into by-law infractions are complaint driven (especially for residential issues). However, ML&S may discover infractions by the commercial sector while out on duty (e.g. illegal dumping). Violations of the various City by-laws that pertain to solid waste matters can lead to prosecution by the City, pursuant to the *Ontario Provincial Offenses Act* for set fines or other outcomes.

Another aspect of enforcement addressed elsewhere in the draft Waste Strategy is joint Provincial / municipal enforcement of Provincial waste regulations.

For more information on Controls, Bans and Enforcement in the City, please refer to Technical Memorandum No. 1[53].

### 7.13.1 Controls, Bans and Enforcement - Rationale & Importance

There are a number of challenges facing the City currently and in the future with respect to controls, bans and enforcement. These include:

- Regulatory, Control and Role/Responsibility Challenges: having a system where some waste management responsibilities are outside of the City's control and therefore subject to uncertainty and risk with respect to external parties making changes that can impact the City's system.
- Impacts of Intensification: the impacts of intensification (i.e. increased urban density) and the changes required to manage additional waste generated by multi-residential buildings with typically lower waste diversion performance records and in areas that are more difficult to collect using traditional methods.
- Solid Waste Services for the IC&I Sector: identifying a legally permissible mechanism to require greater waste diversion from the IC&I sector for waste materials being generated within the City of Toronto.
- Waste Reduction & Reuse: how to better promote and facilitate the reduction and reuse of waste materials to prevent waste from entering the system and requiring management through collection, processing and/or disposal.
- Enhanced Enforcement Opportunities: to maximize the effective and efficient use of its current programs, services and facilities. To date, significant effort and success has been realized through promotion and education; however, there are still areas of the system where opportunity exists with furthering the desired level requiring strategic engagement of enforcement measures.

Based on these specific challenges the following option was considered:

[53] http://www1.toronto.ca/wps/portal/contentonly?vgnextoid=98fc8005b7ae7410VgnVCM10000071d60f89RCRD

- Option 9.7: City Explores Mechanisms to Introduce City-wide Controls over Waste Management

### 7.13.2 Controls, Bans and Enforcement - Recommended Option for Implementation

The comparative evaluation process applied a number of evaluation criteria to each option. The criteria were organized into three categories representing the three fundamental pillars of sustainability (Environmental, Social and Financial) and supported a triple bottom line analysis of each option[54]. As there was only one option in this group, a comparative evaluation process was not completed.

The following option is recommended for implementation in the future.

**Table 7-22: Recommended Controls, Bans and Enforcement Options**

| Option 9.7:<br>City Explores Mechanisms to Introduce City-wide Controls over Waste Management |
|---|
| The City explores whether and how greater waste reduction and diversion might result from undertaking one or more of the following City-wide controls, where legally permissible: banning certain packaging and other material; mandating recycling separation and processing; imposing levies; implementing disposal bans (e.g. construction, renovation and demolition materials); developing local Extended Producer Responsibility measures; improving enforcement of existing City Waste by-laws; and coordinating with the Province on joint enforcement efforts.<br><br>These instruments could apply to both residential and non-residential (e.g. IC&I) and CRD waste and would be designed to reduce the amount of waste disposed and increase diversion. Residential (single family and multi-residential) households already have comprehensive service but the policy would target the remaining waste stream and could lead to additional processing to achieve targets such as organics disposal bans.<br><br>NOTE: The proposed *Waste-Free Ontario Act* could have a significant impact on how waste is managed in the future in the City of Toronto. The City will need to assess potential legal and technical implications of these changes once more is understood about the new legislation. |

To further support an enhanced approach to enforcement in the future system, it is being recommended that enforcement requirements and associated enforcement staff be managed within the SWMS division to allow for greater integration with the SWMS operations and program delivery staff.

The following provides a summary of the Objectives, Benefits, Performance Expectations, Timeline and Implications of implementing these recommendations.

[54] See Technical Memorandum No. 3 – Options Identification and Evaluation Process and Technical Memorandum No. 4 for a description of the evaluation process and Technical Memorandum No. 4 – Detailed Evaluation of Options.

### 7.13.3 Controls, Bans and Enforcement - Primary Objectives and Benefits

The following provides an overview of the primary objectives and benefits of proceeding with the implementation of these recommendations:

- Estimated 255,000 additional tonnes diverted from landfill over the 10 year period.
- Estimated approximately 4% increase in waste diversion overall for the City.
- Decreases the amount of waste disposed.
- Possible creation of new businesses which use the diverted materials.
- Potential to create green jobs and local employment with increased diversion.

### 7.13.4 Controls, Bans and Enforcement - Proposed Timeline for Implementation

The following provides an overview of the proposed timeline for implementation over the next 10 years.

Table 7-23: Controls, Bans and Enforcement – Proposed Timeline for Implementation

| Recommended Options for Implementation | Q3/Q4 | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 | 2023 | 2024 | 2025 | 2026 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Option 9.7: City Explores Mechanism to Introduce Additional Controls Over Waste Management – Bans, by-laws and Acts | | | | | | | | | | | |

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### 7.13.5 Controls, Bans and Enforcement - Long Term Implementation and Operational Considerations

By 2026, these recommendations should be fully implemented and operational. There are no additional Controls, Bans and Enforcement options currently being recommended for implementation post 2026.

## 7.14 System Financing and Funding

The financial implications of the recommended system options have been included above with the discussion of each option. In addition, Section 8 below includes a summary of the overall financial and resources implications of the all the recommended options. However, as part of the options identification process, a number of options were identified that related more to how a program or facility could be implemented versus an actual program or facility itself. As a result, these options were treated separately from the evaluation process and were characterized as potential "Implementation Tools" to be considered where appropriate in the implementation of approved recommendations. The following provides an overview of implementation tools related to system financing and funding in the future.

Table 7-24: System Financing and Funding Implementation Tools

| Implementation Tool | Summary |
|---|---|
| **Option 8.1:** Fully Independent Utility with No Rebate Program. | This option involves recommendations for elimination of the Solid Waste Rebate. The rebate supports the City's priority to achieve long-term sustainability of the Waste Strategy and to move towards a full user pay system that is funded through volume based user fees. This option would involve transitioning to a sustainable rate model. This change would allow the City's Solid Waste Management Services (SWMS) Division to become a separate utility that is fully self-financed through flat or variable fees charged to its customer base. |
| **Option 8.2:** Public-Private Partnerships (P3) for Major Capital Works. | Public-Private Partnerships (P3s) are a long-term performance-based approach for procuring public infrastructure where the private sector assumes a share of the responsibility in terms of risk and financing for the delivery and the performance of the infrastructure, from design and structural planning, to long-term maintenance. Under this option, the City could consider entering into a long-term agreement with a private sector partner to design, construct, finance, operate and maintain a major capital project that would be part of the Waste Strategy. The City would define the scope of the capital project and run a competitive procurement process to select a private sector consortium that provides the best value to the City. |
| **Option 8.3:** Debt Financing. | This option involves the City raising capital by borrowing to finance capital investments. |
| **Option 8.4:** Increase Solid Waste Management Services Customer Base. | Increasing the City's SWMS customer base in the multi-residential/condominium and IC&I sectors beyond current service levels has the potential to generate additional fee revenues and potentially realize some economies of scale. In addition, providing collection service to a broader customer base would allow the City to influence waste diversion behaviour by requiring participation in Blue Bin and Green Bin programs as a condition of receiving City collection service. |
| **Option 8.5:** Allocating Costs for Waste Management to Applicable Waste Streams. | The City would describe the separate fees for each material type collected (garbage, recycling, organics, yard waste etc.) rather than charging one combined fee placed on garbage. Currently this includes provision of collection services for waste and divertible materials. The drawback of the current fee approach is that the multi-residential garbage fee is expensive compared to garbage fees charged by private sector haulers for pick-up of garbage only, because the City fee includes the costs of Blue Bin, Green Bin and other services in the garbage rate charged. |
| **Option 8.6:** Alternative Revenue Generation Opportunities. | The City would identify and implement additional revenue generating opportunities through options such as utilizing biogas produced by City of Toronto facilities (Anaerobic Digestion and landfills) as a source of energy, selling disposal capacity at Green Lane Landfill, selling processing capacity at future facilities such as a mixed-waste, **Mixed Waste Processing with Organics Recovery** or energy from waste facility and other potential revenue sources that may be introduced or present in the industry in the future. |
| **Option 8.7:** Performance Based Incentives. | Provide performance based incentives (e.g. financial) to management of commercial and multi-residential buildings (generally the building supervisor, owner or management staff) to encourage behaviour that will result in an increase of their diversion rates. |

As the implementation of the recommendations is undertaken, the above described tools should be considered to fund implementation. For more information on these options, please refer to Technical Memorandum No. 3[55].

[55] http://www1.toronto.ca/wps/portal/contentonly?vgnextoid=98fc8005b7ae7410VgnVCM10000071d60f89RCRD

# 8 Long Term System Outlook and Roadmap for Implementation

> "*Together we will reduce the amount of waste we generate, reuse what we can, and recycle and recover the remaining resources to reinvest back into the economy. We will embrace a waste management system that is user-friendly, with programs and facilities that balance the needs of the community and the environment with long term financial sustainability. Together, we will ensure a safe, clean, beautiful and healthy City for the future.*"

This vision statement, used in concert with the following eight (8) Guiding Principles to support decision making will guide the implementation of the Waste Strategy in the future.

- Work to Mitigate Climate Change Impacts - To reduce our impact on climate change we will find solutions that reduce greenhouse gas emissions associated with our waste management system.
- Treat Waste as a Resource - Waste is an asset that needs to be conserved. We should make best use of our waste by recovering materials and energy remaining after reducing, reusing, and recycling.
- Prioritize our Community's Health and Environment - The health of our residents and the environment is a priority in decision making to minimize negative impacts and to maximize the benefits.
- Embrace Social Equity - Create an easy-to-use system that all residents and the community can understand and participate in.
- Lead the Change - Strong leadership is taking ownership, leading by action and being responsible for the waste we produce.
- Ensure Financial Sustainability - Financially sustainable solutions that are easy and affordable to maintain by future generations and also help to stimulate economic growth within our community.
- Make the Future System Transparent - Future decisions on the implementation of the Waste Strategy will be open, accessible and based on best practices and facts to find solutions that benefit all.
- Support Development of Community Partnerships - Working together with local community groups and organizations will help us reach our goals and reduce waste more effectively and efficiently.

## 8.1 Summary of Recommended Options & the "10 Year Reduction Plan"

One of the primary goals of the development of this draft Waste Strategy was to identify means to reduce the amount of waste being sent to landfill in the future. This can be accomplished by reducing the amount of waste being generated, reusing materials, and increasing diversion of recyclable materials including organics.

The following Table 8-1 provides a summary of the options being recommended for implementation in the future and those that are specific to contributing to reduced waste to landfill over the next 10 years:

Table 8-1: Summary of Recommended Options

| System Component | Recommended Options | Contributes to Waste Reduction |
|---|---|---|
| Promotion & Education | A range of implementation tools have been identified to support the promotion and education of new programs and services to be implemented as part of this Waste Strategy. | ✓ |
| Reduction & Reuse | • Food Waste Reduction Strategy<br>• Textile Collection and Reuse Strategy<br>• Sharing Library<br>• Support Reuse Events<br>• Explore Opportunities for Waste Exchange | ✓ |
| Collection & Drop-off Depot | • Develop a Network of Permanent Neighbourhood Depots<br>• Develop a Mobile Drop-off Service | ✓ |
| Commissioners Transfer Station | • Relocation of Transfer Station within the Port Lands Area or Designation of Land for Long-Term Relocation | |
| Recycling & Processing | A range of options have been provided with respect to the appropriate next steps and timing associated with the next steps to address these future considerations. | ✓ |
| Materials & Energy Recovery | • Mixed Waste Processing with Organics Recovery Facility Development | ✓ |
| Residual Waste Disposal | <u>Near Term Recommendations</u><br>• Adjust Tipping Fees or Customer Base<br>• Securing Disposal Capacity to Preserve Long-Term Landfill Capacity at GLL<br><u>Long Term Recommendations</u><br>A range of options have been provided with respect to the appropriate next steps and timing associated with the next steps to address these future considerations. | |
| Overall System Recommendations – Multi-residential Services | • Mandatory Multi-residential by-law<br>• Updates to Current Multi-residential Development Standards<br>• Community/Mid-Scale Composting<br>• Container Management | ✓ |
| Overall System Recommendations – Industrial, Commercial & Institutional | • Expand City of Toronto Share of IC&I Waste Management Market To Provide Diversion Opportunities to More Commercial Businesses in City of Toronto<br>• Explore Mandatory Approaches to IC&I Waste Diversion | ✓ |

| System Component | Recommended Options | Contributes to Waste Reduction |
|---|---|---|
| Overall System Recommendations – Construction, Renovation & Demolition | • Depots, Processing, and Policies to Divert CRD Waste<br>• CRD Material Disposal Ban | ✓ |
| Overall System Recommendations – Incentive Based Options | • Incentive Based Drop-off System (e.g. Reverse Vending Machines) | ✓ |
| Overall System Recommendations – Innovation, Research & Development | • Research, Development and Innovation Unit | ✓ |
| Controls, Bans and Enforcement | • City Explores Mechanisms to Introduce City-wide Controls over Waste Management | ✓ |
| System Financing and Funding | A range of implementation tools have been identified to support in the financing and funding of new infrastructure and services to be implemented as part of this Waste Strategy. | |

## 8.2 Timeline for Implementation of Recommended Options

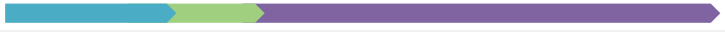
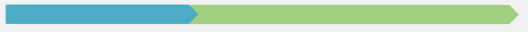
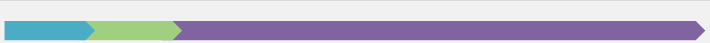
The following timelines have been provided to provide an overview of the proposed approach and timeline for implementation including the estimated cost and resourcing requirements.

### 8.2.1 Recommended 10 Year Implementation Road Map

The following Table 8-2 provides the overall timing and sequencing for implementation of the recommended options. The proposed approach to implementation has been developed taking into account:

- Environmental benefits of the options;
- Consistency with the waste hierarchy (focus on 3Rs first);
- Commitment to social responsibility/acceptability;
- Needs of the system to sustain current operations (e.g. facility capacity requirements);
- Alignment with current contracts where appropriate to facilitate transition;
- Alignment with other external influences (e.g. pending legislation changes in Ontario);
- Availability of staff resources to implement;
- Financial sustainability; and,
- Potential to extend the site life of Green Lane Landfill.

## Table 8-2: 10 Year Timeline for Implementation of Recommended Options

| System Component | Recommended Options for Implementation | Q3/Q4 2016 | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 | 2023 | 2024 | 2025 | 2026 | 10 year total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Promotion & Education | A range of implementation tools have been identified to support in the promotion and education of new programs and services to be implemented as part of this Waste Strategy. | **Implementation tools will be considered throughout the planning, implementation, maintenance and monitoring phases of programs and facilities.** | | | | | | | | | | | |
| | Capital Cost ($) | $50,000 | $100,000 | $100,000 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | **$250,000** |
| | Operation Cost ($) | | $175,000 | $175,000 | $175,000 | $175,000 | $175,000 | $175,000 | $175,000 | $175,000 | $175,000 | $175,000 | **$1,750,000** |
| | Staff Resources (FTE's) | - | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | **1** |
| Reduction & Reuse | Option 2.2: Food Waste Reduction Strategy |  | | | | | | | | | | | |
| | Option 2.3: Textile Collection and Reuse Strategy |  | | | | | | | | | | | |
| | Option 2.4: Sharing Library |  | | | | | | | | | | | |
| | Option 2.5: Support Reuse Events |  | | | | | | | | | | | |
| | Option 2.6: Explore Opportunities for Waste Exchange |  | | | | | | | | | | | |
| | Quantity (Tonnes) | - | - | 100 | 7,000 | 13,500 | 20,000 | 26,500 | 31,000 | 32,500 | 33,000 | 33,000 | **196,600** |
| | Capital Cost ($) | **$0** | **$300,000** | **$525,000** | **$2,750,000** | **$100,000** | **$200,000** | **$200,000** | **$150,000** | **$250,000** | **$150,000** | **$250,000** | **$4,875,000** |
| | Operating Cost ($) | $0 | $80,000 | $144,000 | $575,000 | $365,000 | $425,000 | $275,000 | $315,000 | $275,000 | $275,000 | $275,000 | **$3,004,000** |
| | Staff Resources (FTE's) | - | 0.50 | 1.10 | 2.20 | 2.20 | 1.60 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | **1** |
| Collection & Drop-Off Depot | Option 3.4: Develop a Network of Permanent, Small Scale Neighbourhood Diversion Station in Convenient Locations |  | | | | | | | | | | | |
| | Option 3.5: Develop a Mobile Drop-off Service for Targeted Divertible Materials |  | | | | | | | | | | | |
| | Quantity (Tonnes) | - | - | - | - | 5,000 | 7,500 | 11,000 | 12,750 | 16,250 | 25,000 | 25,000 | **102,500** |
| | Capital Cost ($) | $0 | $0 | $0 | $100,000 | $750,00 | $100,00 | $100,00 | $2,500,000 | $2,500,000 | $2,500,000 | $2,500,000 | **$11,050,000** |
| | Operating Cost ($) | $0 | $0 | $0 | $80,000 | $500,000 | $750,000 | $750,000 | $1,500,000 | $1,500,000 | $1,500,000 | $1,500,000 | **$8,080,000** |
| | Staff Resources (FTE's) | - | - | - | 1 | 2 | 2 | 2 | 3 | 4 | 4 | 4 | **4** |
| Waste Transfer | Option 4.1: Relocation of Transfer Station within the Port Lands Area or Designation of Land for Long-Term Relocation |  | | | | | | | | | | | |
| | Quantity (Tonnes) | - | - | - | - | - | - | - | - | - | - | - | - |

| System Component | Recommended Options for Implementation | Q3/Q4 2016 | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 | 2023 | 2024 | 2025 | 2026 | 10 year total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Capital Cost ($) | $100,000 | $100,000 | $100,000 | $500,000 | $500,000 | $5,000,000 | $10,000,000 | $10,000,000 | $500,000 | $500,000 | $500,000 | **$27,800,000** |
| | Operating Cost ($) | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | **$0** |
| | Staff Resources (FTE's) | - | - | - | - | - | - | - | - | - | - | - | **-** |
| Recycling & Processing | Future Blue Bin Processing Capacity | | | | | | | | | | | | |
| | Quantity (Tonnes) | - | - | - | - | - | - | - | - | - | - | - | **-** |
| | Capital Cost ($) | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | **$0** |
| | Operating Cost ($) | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | **$0** |
| | Staff Resources (FTE's) | - | - | - | - | - | - | - | - | - | - | - | **-** |
| | Future Green Bin Processing Capacity | | | | | | | | | | | | |
| | Quantity (Tonnes) | - | - | - | - | - | - | - | - | - | - | - | **-** |
| | Capital Cost ($) | $0 | $50,000 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | **$50,000** |
| | Operating Cost ($) | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | **$0** |
| | Staff Resources (FTE's) | - | - | - | - | - | - | - | - | - | - | - | **-** |
| Materials & Energy Recovery | Option 6.2: Mixed Waste Processing with Organics Recovery | | | | | | | | | | | | |
| | Quantity (Tonnes) | - | - | - | - | - | - | - | - | - | - | - | **-** |
| | Capital Cost ($) | $0 | $0 | $0 | $0 | $0 | $0 | $200,000 | $200,000 | $500,000 | $500,000 | $750,000 | **$2,150,000** |
| | Operating Cost ($) | $0 | $0 | $0 | $0 | $0 | $0 | $100,000 | $100,000 | $200,000 | $200,000 | $300,000 | **$900,000** |
| | Staff Resources (FTE's) | - | - | - | - | - | - | 1 | 1 | 2 | 2 | 3 | **3** |
| Residual Waste Disposal | Option 7.5: Adjust Tipping Fees or Customer Base. | | | | | | | | | | | | |
| | Option 7.7a: Residual to 3rd Party Facility to Preserve Landfill Capacity. | | | | | | | | | | | | |
| | Future Landfill Disposal Options | | | | | | | | | | | | |
| | Quantity (Tonnes) | - | 150,000 | 150,000 | 150,000 | 150,000 | 150,000 | 150,000 | 150,000 | 150,000 | 150,000 | 150,000 | **1,500,000** |
| | Capital Cost ($) | $20,000 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | **$20,000** |
| | Operating Cost ($) | $20,000 | -$1,500,000 | -$1,500,000 | -$1,500,000 | -$1,500,000 | -$1,500,000 | -$1,500,000 | -$1,500,000 | -$1,500,000 | -$1,500,000 | -$1,500,000 | **-$14,980,000** |
| | Staff Resources (FTE's) | - | - | - | - | - | - | - | - | - | - | - | **-** |
| Overall System Recommendations – | Option 1.8. Mandatory Multi-Residential By-law. *New* | | | | | | | | | | | | |

| System Component | Recommended Options for Implementation | Q3/Q4 2016 | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 | 2023 | 2024 | 2025 | 2026 | 10 year total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Multi-Residential Services | Option 1.9. Updates to Current Multi-Residential Development Standards. | | | | | | | | | | | | |
| | Option 2.7: Community/Mid-Scale Composting. | | | | | | | | | | | | |
| | Option 3.1: Container management. | | | | | | | | | | | | |
| | Quantity (Tonnes) | - | - | - | - | 10,300 | 13,000 | 15,500 | 18,000 | 20,600 | 20,600 | 20,600 | **118,600** |
| | Capital Cost ($) | $0 | $100,000 | $100,000 | $100,000 | $250,000 | $100,000 | $100,000 | $100,000 | $100,000 | $100,000 | $100,000 | **$1,150,000** |
| | Operating Cost ($) | $0 | $80,000 | $80,000 | $80,000 | $200,000 | $150,000 | $50,000 | $25,000 | $25,000 | $25,000 | $25,000 | **$740,000** |
| | Staff Resources (FTE's) | - | 0.5 | 0.5 | 0.5 | 0.5 | 0.5 | 0.5 | 0.5 | 0.5 | 0.5 | 0.5 | **1** |
| Overall System Recommendations – Industrial, Commercial & Institutional | Option 9.3: Expand City of Toronto Share of IC&I Waste Management Market. | | | | | | | | | | | | |
| | Option 9.4: City Implements IC&I Waste Diversion Policies. | | | | | | | | | | | | |
| | Quantity (Tonnes) | - | - | - | - | - | - | 2,500 | 5,000 | 7,500 | 7,500 | 7,500 | **30,000** |
| | Capital Cost ($) | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | **$0** |
| | Operating Cost ($) | $0 | $0 | $50,000 | $50,000 | $50,000 | $50,000 | $50,000 | $50,000 | $25,000 | $25,000 | $25,000 | **$375,000** |
| | Staff Resources (FTE's) | - | - | 0.5 | 0.5 | 0.5 | 0.5 | 0.5 | 0.5 | 0.25 | 0.25 | 0.25 | **0.25** |
| Overall System Recommendations – Construction, Renovation & Demolition | Option 10.1: Depots, Processing, and Policies to Divert CRD Waste | | | | | | | | | | | | |
| | Option 10.2: CRD Disposal Ban | | | | | | | | | | | | |
| | Quantity (Tonnes) | - | - | - | - | - | - | - | - | - | - | - | **-** |
| | Capital Cost ($) | $0 | $0 | $0 | $0 | $0 | $0 | $250,000 | $250,000 | $250,000 | $0 | $0 | **$750,000** |
| | Operating Cost ($) | $0 | $0 | $0 | $0 | $0 | $0 | $100,000 | $100,000 | $100,000 | $0 | $0 | **$300,000** |
| | Staff Resources (FTE's) | - | - | - | - | - | - | 1 | 1 | 1 | - | - | **-** |
| Overall System Recommendations – Incentive Based Options | Option 3.6: Incentive based drop off system (e.g. reverse vending machines). | | | | | | | | | | | | |
| | Quantity (Tonnes) | - | - | - | - | - | - | - | 1,000 | 1,000 | 1,000 | 1,000 | **4,000** |
| | Capital Cost ($) | $0 | $0 | $0 | $0 | $0 | $0 | $100,000 | $10,000 | $10,000 | $10,000 | $10,000 | **$140,000** |
| | Operating Cost ($) | $0 | $0 | $0 | $0 | $0 | $25,000 | $25,000 | $50,000 | $10,000 | $10,000 | $10,000 | **$130,000** |
| | Staff Resources (FTE's) | - | - | - | - | - | 0.25 | 0.25 | 1 | 0.1 | 0.1 | 0.1 | **0.1** |

| System Component | Recommended Options for Implementation | Q3/Q4 2016 | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 | 2023 | 2024 | 2025 | 2026 | 10 year total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Option 9.13: Research, Development & Innovation Unit | Option 9.13: Research, Development & Innovation Unit | | | | | | | | | | | | |
| | Quantity (Tonnes) | - | - | - | - | - | - | - | - | 5,000 | 10,000 | 10,000 | **25,000** |
| | Capital Cost ($) | $0 | $0 | $0 | $0 | $0 | $0 | $50,000 | $50,000 | $100,000 | $100,000 | $100,000 | **$400,000** |
| | Operating Cost ($) | $0 | $0 | $0 | $0 | $0 | $0 | $50,000 | $50,000 | $80,000 | $160,000 | $160,000 | **$500,000** |
| | Staff Resources (FTE's) | - | - | - | - | - | - | 0.5 | 0.5 | 1 | 2 | 2 | **2** |
| Controls, Bans and Enforcement | Option 9.7: City Explores Mechanisms to Introduce Additional Controls Over Waste Management – Bans, By-laws and Acts. | | | | | | | | | | | | |
| | Quantity (Tonnes) | - | - | 5,000 | 15,000 | 25,000 | 35,000 | 35,000 | 35,000 | 35,000 | 35,000 | 35,000 | **255,000** |
| | Capital Cost ($) | $0 | $100,000 | $1,000,000 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | **$1,100,000** |
| | Operating Cost ($) | $0 | $175,000 | $175,000 | $660,000 | $1,320,000 | $1,870,000 | $1,870,000 | $1,870,000 | $1,870,000 | $1,870,000 | $1,870,000 | **$13,550,000** |
| | Staff Resources (FTE's) | - | 1 | 1 | 6 | 12 | 17 | 17 | 17 | 17 | 17 | 17 | **17** |
| System Financing and Funding | A range of implementation tools have been identified to support in the financing and funding of new infrastructure and services to be implemented as part of this Waste Strategy. | **Implementation Tools will be considered throughout the planning, implementation, maintenance and monitoring phases of programs and facilities.** | | | | | | | | | | | **N/A** |

### 8.2.2 Identified Longer Term System Needs

The following Table 8-3 provides an overview of longer term capital requirements that will need to be taken into account in future budgeting processes.

Table 8-3: Longer Term System Needs

| Cost & Resource Summary | Q3/Q4 2016 - 2021 | 2022 - 2026 | 10 Year Total | 2027-2031 | 2032-2036 | 2037-2041 | 2042-2046 | 2047-2051 | 2052+ | Planning Period Total |
|---|---|---|---|---|---|---|---|---|---|---|
| Staff | | | | | | | | | | |
| Additional FTEs | 26 | 5 | 5 | | | | | | | |
| % increase | 2% | 0.5% | 0% | | | | | | | |
| **Costs** | | | | | | | | | | |
| Major Capital Investments ('000s) | | | | | | | | | | |
| New Transfer Station Facility | $6,300 | $21,500 | $27,800 | | | | | | | $27,800 |
| New Neighbourhood Depots | $950 | $10,100 | | $5,000 | $5,000 | | | | | $10,000 |
| New Organics Processing Capacity | | | $0 | | $50,000 | $50,000 | | | | $100,000 |
| Mixed Waste Processing with Organics Recovery Capacity | $0 | $2,150 | $2,150 | $150,000 | $150,000 | | | | | $302,150 |
| New Residual Waste Capacity | | | $0 | | | | $50,000 | $50,000 | $150,000 | $250,000 |
| Total Estimated Costs ('000s) | | | | | | | | | | |
| Operating Costs | $2,904 | $24,045 | $26,949 | | | | | | | $26,949 |
| Total Capital Costs | $15,345 | $95,390 | $110,735 | $155,000 | $205,000 | $50,000 | $50,000 | $50,000 | $150,000 | $770,735 |

# 9 Measuring Performance in the Future

The City already tracks a comprehensive set of performance metrics for the integrated solid waste management system.

Monitoring the performance of the current integrated solid waste management system, as well as new system options that may be added, is vital to ensure the effectiveness and efficiency overall. Understanding the performance of the overall integrated solid waste management system, as well as each component of the system, provides for a better understanding of the potential areas for improvement, future trends to watch for, and return on investment as new programs or facilities are implemented.

It is proposed that the metrics identified below be considered for future reporting. These metrics have been specifically identified to:

- Reflect the performance of the current integrated waste management system;
- Measure the impact of the implementation of new Waste Strategy related recommended options;
- Monitor trends associated with waste reduction and reuse activities; and,
- Provide for transparency on aspects of solid waste management including customer service, enforcement actions, safety performance, etc.

As new programs and facilities are implemented, the list of performance measures should be reviewed to ensure that future performance is appropriately tracked.

Table 9-1: Recommended Performance Metrics

| Metric | Measure | 2014 Actuals |
|---|---|---|
| Per Capita Residential Waste Generation | Kilograms/Capita | New Metric |
| Single Family Residential | Kilograms/Capita | New Metric |
| Multi-residential | Kilograms/Capita | New Metric |
| Residential Waste Diversion rate | % Diversion | 53% |
| Single Family Residential | % Diversion | 66% |
| Multi-residential | % Diversion | 26% |
| Collection Complaints per (billable) Customer | Number of Complaints | 27,060 |
| Number of Enforcement Actions Taken | Total Number | New Metric |
| Customer Satisfaction Rating | Customer Satisfaction Rating | New Metric |
| Safety Performance | Multiple Metrics | New Metric |
| Lost Times | Total Annual | 42 |

| Metric | Measure | 2014 Actuals |
|---|---|---|
| Medical Aids | Total Annual | 89 |
| First Aids | Total Annual | 86 |
| Collisions (preventable) | Total Annual | 96 |
| Collisions (non-preventable) | Total Annual | 89 |
| Greenhouse Gas Emission Reduction | % Reduction | New Metric |
| Number and Significance of Advocacy Issues Involved | Total Number | New Metric |
| Number of New Community Partnerships Formed | Total Number | New Metric |
| Number of procurements that include waste reduction, reuse or recycling requirements such as mandating the use of recycled materials. | Total Number | New Metric |
| Transfer and Processing Cost | $/per tonne | $58.40 |
| Total Tonnage Managed | Tonnes | 1,025,383 |
| Green Lane Landfill Volume Filled | Cubic metres ($m^3$)/year | 510,000 |
| Green Lane Landfill Volume Remaining | Cubic metres ($m^3$) | 11,147,000 |

Over the next five years, if passed, Bill 151: the *Waste-Free Ontario Act*[56] will outline a new direction for management of waste in the Province. The City will need to adapt to reflect the evolving role of the City of Toronto in the Provincial solid waste management system.

The identification of additional performance metrics to reflect the new Waste Strategy components is also consistent with Implementation Tool "Option 9.12: Performance Measures to Define Success and Shape the Future of Waste Management".

[56] See Section 10.2.1 for additional information on the proposed *Waste-Free Ontario Act* and its potential implications.

# 10 Waste Strategy Updates, Revisions and Reporting

## 10.1 Updates and Revisions to Waste Strategy

The Long Term Waste Management Strategy will require a review timeline and methodology, to address the need for regular updates and adjustments to the plan.

It is recommended that the first official review of the Waste Strategy be completed in five years or during 2021, with subsequent updates being completed every five years. The following are some potential triggers that may necessitate a need for review of the Waste Strategy prior to the recommended five year review period:

- A change in legislation as it relates to program and/or service delivery;
- Financial impacts/opportunities such as new sources of funding or decreased material markets, customers and commodity prices;
- Advancements in new technologies that could benefit the City; or,
- A change in customer base.

Formal review points, and as required interim review points, provide an opportunity for any major adjustments to the Waste Strategy as required.

## 10.2 Potential Impacts of New Legislation

### 10.2.1 Background to the *Waste-Free Ontario Act* (Bill 151)

On November 26, 2015, the Ontario Minister of Environment and Climate Change introduced for first reading, Bill 151: *Waste-Free Ontario Act* that is intended to change the existing waste diversion framework and support a circular economy, aimed to increase waste reduction and resource recovery. The enabling legislation consists of: the *Resource Recovery and Circular Economy Act* (RRCEA) and the *Waste Diversion Transition Act* (WDTA) (that repeals and replaces the *Waste Diversion Act*, 2002).

The WDTA sets forth a legislative framework for transitioning existing Industry Funding Organization (IFO) programs for Blue Box materials, municipal household and special waste (MHSW), Waste Electrical and Electronic Equipment (WEEE) and used tires to an extended producer responsibility regime under the new *Resource Recovery and Circular Economy Act.* If the WDTA is enacted, it would replace the existing governing legislation and enable the orderly wind up of existing waste diversion programs and Industry Funding Organizations that operate these programs.

One of the most important components of the new Act, are the 15 specific aims comprising the Provincial Interest with which all policy statements and regulations promulgated under the Act must align.

Note that there is considerable alignment of the City's Long Term Vision and Recommended Options of the draft Waste Strategy with the components of the "Provincial interest" identified above.

As the waste management landscape changes in Ontario with the new legislation, the role of the City in some aspects of waste management (particularly Blue Bin, WEEE, tires and MHSW) is expected to change over time, as extended producer responsibility is implemented in the Province. The Resource Productivity and Recovery Authority which will be established by the RRCEA, to replace Waste Diversion Ontario, will track waste management system performance in Ontario, on a material-by-material basis. The Province may enact various policies that will change the way in which non-residential waste in particular is managed. The Province's Climate Change Strategy and cap and trade system will also influence some aspects of the waste management system over time (particularly organics, Blue Box materials and landfills).

The proposed legislation will impact how Ontario municipalities manage materials in the waste stream, particularly Blue Bin materials. It is likely that the City will continue to manage residential garbage and organics in the new waste system, however, the proposed legislation provides opportunities for the City to examine and consider the extent to which it is involved in management of other materials in the waste stream such as Blue Bin materials.

Over the next five years in particular, as the shape of the *Waste-Free Ontario Act* and the role of municipalities in the proposed new waste system becomes clearer, performance measures will need to be re-examined and revised to reflect the evolving role of the City in some aspects of the solid waste management system.

## 10.3 Annual System Monitoring and Reporting

Annual reporting, both internally and externally, beyond the data collected and reported formally to other parties, is an excellent means of demonstrating the progress achieved by both the municipality and the non-municipal partners and participants. Across Ontario, many large municipal jurisdictions prepare some form of annual report on waste management program performance. These reports provide an opportunity to present data gathered and reported as part of the Financial Information Return (FIR), Ontario Municipal Benchmarking Initiative (OMBI) and Waste Diversion Ontario (WDO) requirements, in a more engaging and interesting format.

The annual report card presents the opportunity to report on the current year, highlight accomplishments, present minor adjustments. It is recommended that an annual report card documenting the performance of the waste management system be prepared in the spring of each year, once final year end accounting is complete. At a minimum, this report card should include data on performance measures identified inTable 9-1 above.

In addition to the performance of the subject year, a comparison to the baseline should be provided with commentary where appropriate to address items such as:

- Programmatic or facility changes that were implemented that could have impacted quantities managed, tonnes diverted, etc.;
- Waste generation anomalies (e.g. severe weather event);
- Changes to external influences such as changes to Provincial or Federal legislation;
- Contract changes with City contracted service providers where there has been a change to service level; and,
- Identification of potential trends, such as a year over year increase in waste generation that should be monitored to assess the potential for future system impact.

The following provides a sample of what is recommended for inclusion in the annual report card:

- Summary
    - Short, graphic summary of key performance indicators, major accomplishments and most significant new initiatives implemented.
- Annual Implementation Activities
    - Overview of the prior year's plan and what has been implemented to-date; and
    - Highlights of upcoming year's plan.
- Integrated Solid Waste Management System Performance Assessment
    - Overview of the performance for all of the strategies/Initiatives completed the prior year;
    - Industry recognition and awards; and,
    - Identification of trends, drivers and external influence changes.
- Public and Stakeholder Engagement Activities
    - Summary of public and stakeholder engagement activities completed in the prior year.
- Proposed Current Year (and upcoming year) Initiatives
    - Breakdown of the planned initiatives for the current year.
- Concluding Commentary

Note: some of the above activities are already publicly reported by the City each year.

# 11 Next Steps to Finalize Strategy

This document is in draft form intended for consultation. The following Figure 11-1 provides an overview of the next steps leading up to document finalization.

Figure 11-1: Next Steps