LONG TERM WASTE STRATEGY

Technical Memorandum No. 4
Options Evaluation

DRAFT for REVIEW

TORONTO

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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 that are cost-effective, socially acceptable and environmentally sustainable for the long

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

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

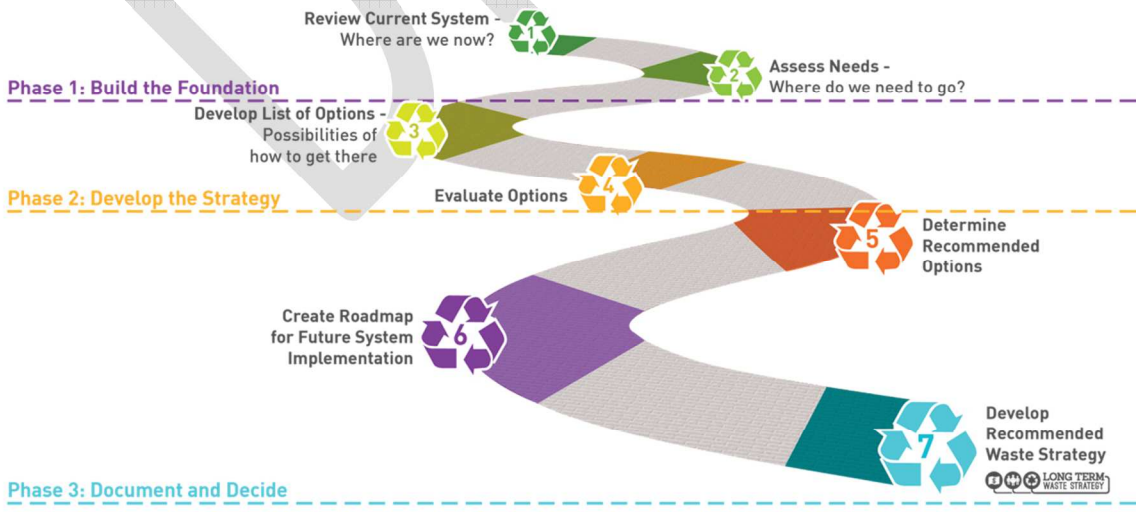
Development of a Long Term Waste Management Strategy is Strategic Action #7 in Council's 2013-2018 Strategic Action Plan. The Long Term Waste Management Strategy is to be developed in partnership with community and divisional stakeholders that are environmentally sustainable and economically viable. 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 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

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

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" (SUBJECT OF THIS DOCUMENT)

During this phase, a detailed evaluation of the options identified in Phase 2 was conducted from an environmental, social and financial perspective to identify a series of recommended long-term options for the City. Technical Memorandum No. 4 (this document) provides an overview of the evaluation process and resulting recommended options for the City.

Phase 3 – DOCUMENT AND DECIDE

Once the recommendations for change have been determined, the Waste Strategy document will be 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.

Deliverable 5 – "Prepare and draft the Long Term Waste Management Strategy document"

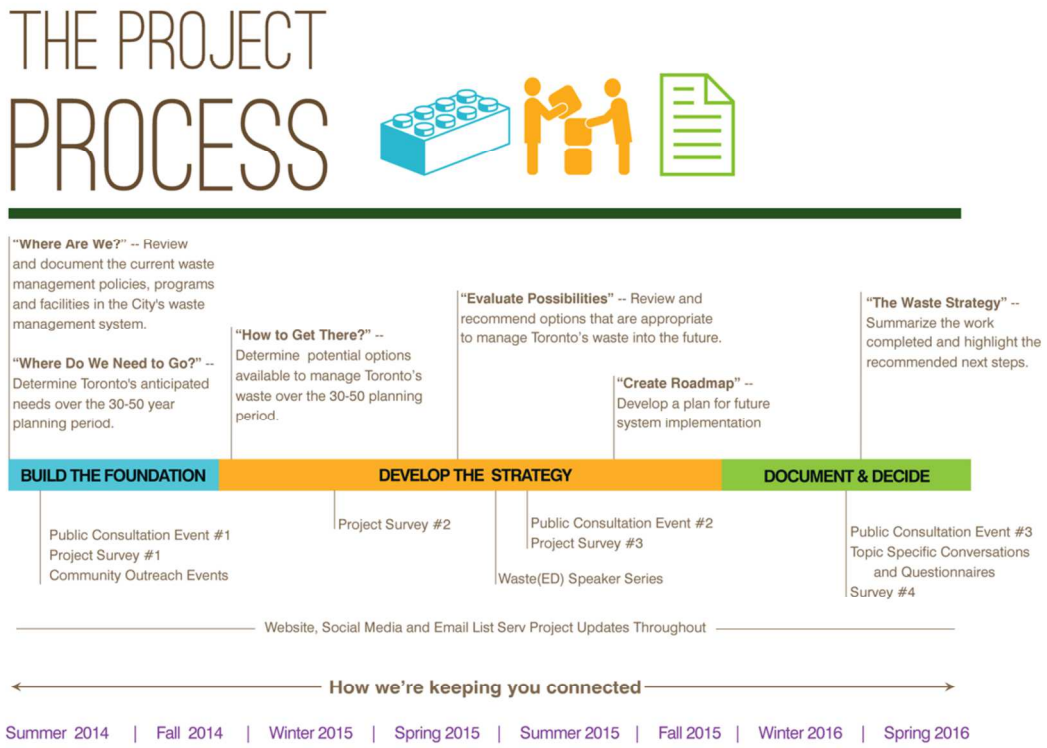
The Waste Strategy will be developed using the results of the evaluation process. It will include an implementation "roadmap" to help guide the City's integrated waste management system for the next 30 to 50 years. The final Waste Strategy will also include a consultation report documenting the consultation activities conducted during development of the Waste Strategy. Reports on consultation completed to date can be found on the City's website[5].

In parallel to the completion of the three phases, a comprehensive consultation plan has been, and will continue to be, 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 will provide regular updates to PWIC on the development of the Waste Strategy.

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

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

Figure 2-2: The Project Process



3 Options Identification and Evaluation Methodology

As described above, Technical Memorandum No. 3 identifies and discusses a list of options available to the City that could be implemented in the future, as well as an evaluation methodology and criteria to be used to evaluate each option.

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 Street Station; Recovery (new facilities); Residual Waste; Multi-residential; Industrial, Commercial & Institutional; Construction, Renovation, Demolition; Control, Bans & Enforcement; and Incentive Based Mechanisms. These categories were also important as they reflect the various components of the integrated waste management system. Within each category, like options were comparatively evaluated to determine the recommended options. Some of the options were 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.**Error! Reference source not found.**Table 3-1 presents the list of system components, and the options discussed in the following sections that were evaluated.

A complete description of all the options can be found in Technical Memo No. 3[6], including those classified as "Implementation Tools" or "Future Considerations". Technical Memorandum No. 3 also included and described the evaluation methodology and criteria used to evaluate each option.

Table 3-1: Summary of Options by System Component

System Component	Option Number and Title
Generation, Reduction and 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.
Collection & Drop-off Depots	Option 3.3: 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.
Commissioners Street Transfer Station	Option 4.1: Relocation of Commissioners Street Transfer Station within the Port Lands Area or Designation of Land for Long-Term Relocation.
	Option 4.2: Redirecting Waste to an Existing Transfer Station(s).
	Option 4.3: Procure Transfer Capacity at a Private Transfer Station in Vicinity of the Port Lands Area (if available).
Materials &	Option 6.1: Mixed Waste Processing Facility Development.

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

System Component	Option Number and Title
Energy Recovery	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.
	Option 6.6: Refuse Derived Fuel Facility Development.
	Option 6.7: Waste to Liquid Fuel Technologies Facility Development.
Residual Waste Disposal	Option 7.1: Landfill Expansion.
	Option 7.3: Bio-reactor Landfill.
	Option 7.5: Adjust Tipping Fees or Customer Base.
	Option 7.6: Purchase a New Landfill.
	Option 7.7a: Securing Disposal Capacity to Preserve Long-Term Landfill Capacity at Green Lane Landfill.
	Option 7.7b: Securing Disposal Capacity for Residual Management Following Green Lane Landfill Reaching its Approved Disposal Capacity.
	Option 7.8: Greenfield Landfill.
Overall System Considerations: Multi-residential Services	**Organics Management**
	Option 2.7: Community/Mid-Scale Composting.
	Option 5.1: On-site Organics Processing.
	Option 5.2: In-Sink Disposal Units.
	Waste Collection Methods
	Option 3.1: Container Management.
	Option 9.1: Elimination of Collection Service to Multi-residential Buildings.
	Option 3.7: Multi-residential Collection using Alternative Vehicles.
	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
	Planning, Policies and Enforcement
	Option 1.8 Multi-residential by-law and Enforcement.
	Option 1.9. Updates to Current Multi-residential Development Standards.
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
	Option 9.4: Explore Mandatory Approaches to Industrial, Commercial and Institutional Waste Diversion
	Option 9.5: City of Toronto Exits the Industrial, Commercial and Institutional Waste Management Service.
Overall System Considerations:	Option 10.1: Depots, Processing, and Policies to Divert Construction, Renovation, Demolition Waste

System Component	Option Number and Title
Construction, Renovation, Demolition (CRD) Services	Option 10.2: Construction, Renovation, Demolition Material Disposal Ban.
Overall System Considerations: Incentive-based Mechanisms	Option 3.6: Incentive Based Drop-off System (e.g. Reverse Vending Machines).
	Option 9.8: Deposit-return System for City of Toronto for Selected Materials.
Control, Bans, & Enforcement	Option 9.7: City Explores Mechanisms to Introduce City-wide Controls over Waste Management.

For each of the options identified above, full descriptions were developed including: a summary; City of Toronto Experience; Municipal/Waste Industry Experience; Case Studies/Examples; Considerations; and Potential Outcomes. Full descriptions of these options can be found in Technical Memorandum No. 3. For those options undergoing evaluation, the descriptions form part of the evaluation tables and also form part of **Appendix A** to this Technical Memorandum (Technical Memorandum No. 4).

The following Table 3-2 contains the approved[7] evaluation criteria that were applied to the options identified. The criteria have been organized under three categories that represent the three fundamental pillars of sustainability (Environmental, Social and Financial) and support a triple bottom line analysis of each option. Beside each criterion are sets of indicators, which are the specific considerations or measures that were applied where appropriate to identify the potential net effects related to the respective criterion. It is important that evaluation criteria are appropriate to the options being evaluated and therefore adjustments to the criteria and their application have been undertaken as appropriate and depending on the options evaluated.

As described in Technical Memorandum No. 3, the criteria involving public health were specifically reviewed by Toronto Public Health (TPH) staff as well as an expert panel of professionals using a modified version of the TPH Health Impact Assessment (HIA) Screening Assessment Tool to score the health-related options. Each option was considered from the perspective of multiple determinants of health. Based on the information available, the direction of the potential impact (negative or positive) was predicted, as well as an estimate of the magnitude of the impact. This information was incorporated into the overall evaluation process for each option.

[7] Approved by Resolution of City Council on September 30, 2015.

Table 3-2: Approved Evaluation Criteria

Category	Criteria	Indicators
Environmental Impact/Benefit	Local Environmental Impact/Benefit	• Potential impacts/benefits to land resources • Potential impacts to local airshed • Potential impacts to local water sources • Potential water consumption requirements • Total land required and land use displacement
	Regional/Global Environmental Impact/Benefit	• Energy and fossil fuel generation / consumption • Greenhouse gas contributions
	Public Health Impact/Benefit	• Potential to impact human health • Potential to impact ecological health
	Potential to Increase Diversion	• Ability to recover additional reusable and/or recyclable materials
	Waste Hierarchy	• Consistency with the priorities of the waste hierarchy
Social Impact/Benefit	Approvals Complexity	• Complexity associated with approvals and permitting requirements
	Potential for Land Use Conflicts/Community Interruption	• Potential for traffic increase/reduction • Potential for litter increase/reduction • Potential odour emissions • Potential noise emissions • Potential for increased vector/vermin
	Collaboration	• Ability to partner with other municipalities/ organizations
	Complexity	• Program complexity to user
	Convenience	• Ease of participation
	Community Safety	• Potential for impacts to community safety
	Equity	• Potential for unequal impacts/benefits to specific groups
	Behaviour Change	• Potential to influence or encourage behaviour resulting in sustainable waste reduction choices
Financial Impact/Benefit	Cost	• Estimated net capital cost • Estimated net operating cost

Category	Criteria	Indicators
	Health Care Cost Implications	• Potential to increase health care costs
	Risk	• Potential for contractual risk • Schedule risk • Innovation risk
	Economic Growth	• Potential for local economic growth • Potential for regional/global economic growth
	Local Job Creation	• Potential for additional local job creation
	Flexibility	• Ability to accommodate future changes (e.g. Regulation, waste composition, etc.)

3.1 Purpose of this Technical Memorandum

Following the development of a list of potential options covering the full range of the waste management hierarchy, a detailed evaluation of each option was completed. Technical Memorandum No. 3[8] included a detailed evaluation methodology, including the evaluation process, criteria and priorities in the evaluation that was approved by City Council in October 2015. The purpose of this Technical Memorandum No. 4 is to document the evaluation of each of the program and facilities/infrastructure options identified, the results of the evaluation process to identify the recommended options and the implementation considerations for the recommended options.

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

4 Application of Evaluation Criteria

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. It is also supported by a review and evaluation of potential options for the future that reflects what is important to the community.

In order to ensure the evaluation process to be applied in the development of Waste Strategy was acceptable to the community and its many stakeholders, the proposed evaluation criteria were included in the Phase 2 consultation process.

The proposed evaluation criteria were developed to reflect the Vision and Guiding Principles set out for the Waste Strategy and have been revised where appropriate to reflect input received during the Phase 2 consultation process.

Section 3 above provides a summary of the evaluation process that was completed. For a more detailed overview of the evaluation methodology, please refer to Technical Memorandum No. 3[9].

4.1 Use of Scorecard

The following provides the comparative evaluation "scorecard" that was utilized in the evaluation of options to ensure the consistent application of criteria.

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

Table 4-1: Comparative Evaluation Scorecard

Criteria	Indicators	Low (1)	Medium (2)	High (3)
Environmental Impact/Benefit				
Local Environmental Impact/Benefit	Potential impacts/benefits to land resources.	Potential to contaminate ground surface.	Minimal to no impact/benefit to land resources. No contact with ground surface.	End-product can benefit land (e.g. compost, digestate, biosolids).
	Potential impacts to local airshed.	Significant release of emissions to atmosphere.	Some release of emissions to atmosphere.	Minimal to no release of emissions to atmosphere
	Potential impacts to local water sources.	High potential to contaminate water.	Some potential to contaminate water.	Minimal to no release of potential contaminants to water.
	Potential water consumption requirements.	Large quantities of water required (e.g. for processing).	Some water required for cleaning, staff facilities, etc.	Minimal to no water required.
	Total land required and land use displacement.	Requires additional land for implementation and operation.	Minimal to no additional land required.	Potential to "free up" space/land. Located on existing site/building.
Regional/Global Environmental Impact/Benefit	Energy and fossil fuel generation / consumption.	More fuel used to haul materials a longer distance (i.e. more consumption). Increased in Power Consumption	Minimal to no energy and fossil fuel generation/consumption.	Energy generated to offset fuel/energy used.
	Greenhouse gas (GHG) contributions.	Option results in increased traffic/ vehicles and/or hauling material longer distances. Option results in more methane generating material going to landfill.	Minimal to no additional GHG emissions produced.	Production of biofuel/energy offsets GHG emissions or displaces uses of traditional fuel. Consolidation of facilities/vehicles. Minimal to no vehicle usage. Diverts methane generating material from landfill.
Public Health Impact/Benefit	Potential to impact human health	Potential for adverse impacts on public health.	Minimal to no potential for beneficial impact on public health.	Potential for beneficial impact on public health.
	Potential to impact	Potential for off-site	Minimal to no potential for off-	Benefit to ecological health by

Criteria	Indicators	Low (1)	Medium (2)	High (3)
	ecological health	release of potential contaminants.	site release of potential contaminants.	reducing potential contaminants to the environment.
Potential to Increase Diversion	Ability to recover additional reusable and/or recyclable materials	Minimal to no potential for diversion. (0-1%)	Some potential for diversion. (2-5%)	High potential for diversion. (>5%).
Waste Hierarchy	Consistency with the priorities of the waste hierarchy	Minimal to no consistency with the priorities of the waste hierarchy. Option manages waste with little to no value or beneficial use.	Some consistency with the priorities of the waste hierarchy. Option recognizes resource value of waste and provides opportunities for recycling, materials recovery, and beneficial use of materials.	Significant consistency with the priorities of the waste hierarchy. Option places emphasis on the reduction and/or reuse of materials to prevent their entering the waste stream.
Social Impact/Benefit				
Approvals Complexity	Complexity associated with approvals and permitting requirements	Large complex multi-stakeholder approvals required (e.g. EA).	Medium complexity approvals required (e.g. ECA or amendment, Zoning by-law change).	No other approvals required.
Potential for Land Use Conflicts/ Community Interruption	Potential for traffic increase/reduction	Increase in potential for additional traffic.	Minimal to no increase/reduction in traffic.	Reduction in potential traffic.
	Potential for litter increase/reduction	Increase in potential for litter generation.	Minimal to no increase/reduction in litter.	Reduction in potential for litter generation.
	Potential odour emissions	Potential for increased odour emissions.	Minimal to no odour emissions.	Reduction in potential for odour emissions.
	Potential noise emissions	Potential for increased noise.	Minimal to no noise emissions.	Reduction in potential for noise emissions.
	Potential for increased vector/vermin	Potential for increased vector/vermin.	Minimal to no potential for vector/vermin.	Reduction in potential for vector/vermin.
Collaboration	Ability to partner with other municipalities/ organizations	No ability to partner with any municipality or organization.	Can only partner with a single group (e.g. municipalities) or limited ability to partner.	Ability to partner with a large number of municipalities or organizations.
Complexity	Program complexity to user	Program is complex and requires significant	Some complexity with need for some participant education.	Program is very easy to use and understand.

Criteria	Indicators	Low (1)	Medium (2)	High (3)
		participant education.		Option does not involve user.
Convenience	Ease of participation	Not convenient/easy to access, requires significant effort for customer to participate.	Relatively easy to access with limited effort required for customer participation.	No additional effort to participate. Program comes to user (e.g. mobile depot) or can be used in-home/on-site.
Community Safety	Potential for impacts to community safety	Potential to increase number and type of safety issues	Minimal to no potential to increase number and type of safety issues.	Potential for improvement to community safety
Equity	Potential for unequal impacts/benefits to specific groups	Option could have unequal impacts on residents/stakeholders.	Option is available to everyone equally.	Increased equality when compared to current situation.
Behaviour Change	Potential to influence or encourage behaviour resulting in sustainable waste reduction choices	Minimal to no potential to change behaviour as user is not connected with option (e.g. recovery facility, or landfill).	Some potential to change behaviour through promotion and education activities, campaigns, strategies.	Significant potential to change behaviour through by-law, act, fees, bans.
Financial Impact/Benefit				
Cost	Estimated net capital cost	Highest capital costs relative to other options.	Medium capital costs relative to other options.	Minimal to no capital costs relative to other options.
	Estimated net operating cost	Increases in operating costs.	Minimal to no change to current operating costs.	Potential to reduce operating costs.
Health Care Cost Implications	Potential to increase health care costs	Potential to result in increased health costs	Uncertain although unlikely that the option will result in increased health care costs	Unlikely to result in increased health costs and some potential for reduction in health costs.
Risk	Potential for contractual risk	Complex option with multiple suppliers/parties.	Limited risk with some reliance on implementation/operation by third-parties. Contract risk is manageable.	Minimal to no contractual risk with implementation/ operation with City Staff.
	Schedule risk	High schedule risk. Complex option with multiple suppliers/parties.	Some schedule risk, but manageable. Some risk with timing of approvals.	Minimal to no schedule risk. Option is relatively easy to implement.
	Innovation risk	Significant innovation risk since option involves	Some innovation risk with some aspects of known	Minimal to no innovation risk, option includes collection,

Criteria	Indicators	Low (1)	Medium (2)	High (3)
		collection, processing, disposal technology or equipment which is not proven or used in a similar scale as for City of Toronto waste management.	collection, processing, disposal technology or equipment which may not have been used at the same scale required for Toronto.	processing, disposal technology or equipment all well known and used at a similar scale as required for City of Toronto.
Economic Growth	Potential for local economic growth	Minimal to no potential for local economic growth. Option not situated in the City of Toronto.	Some potential for local economic growth. Short term option with limited potential for local economic growth.	Significant potential for local economic growth. Option involves multiple parties which can provide economic growth opportunities. Option results in end-products which require collection, processing, disposal. Option results in beneficial end-product which can be further processed and marketed (e.g. compost, compressed natural gas). Long term option with potential for economic growth in the future.
	Potential for regional/global economic growth	Minimal to no potential for regional/global economic growth.	Some potential for regional/global economic growth on a short term basis.	Significant potential for regional/global economic growth since option utilizes businesses, equipment or technology located in Canada or internationally on a long-term or ongoing basis.
Local Job Creation	Potential for additional local job creation	Option reduces potential for local job creation (e.g. situated outside City of Toronto). Option removes jobs.	Minimal to no potential for local job creation. Option run by volunteers. Option does not provide ability to generate jobs (e.g. reuse events).	Some or significant potential for local job creation. Option creates a number of local short or long-term jobs.

Criteria	Indicators	Low (1)	Medium (2)	High (3)
Flexibility	Ability to accommodate future changes	Minimal to no flexibility. Not flexible – can only be located in certain areas, cannot be re-located easily, specific to certain feedstocks, produces limited end-products. Would require significant permitting/approval changes to accommodate changes. Limited or fixed capacity.	Some flexibility. Somewhat flexible – can handle some changes in material or feedstock, could be relocated or sited elsewhere. Minor amendments required for approvals/permits. Somewhat easy to expand.	Significant flexibility. Very flexible - High ability to accommodate future changes in feedstock, materials accepted, location, produces a variety of products with many markets etc. Easily moved to different locations. Modular option, easily expanded.

5 Summary of Comparative Evaluations Results

The following sections provide an overview of the results of the comparative evaluation of the options. For each option undergoing evaluation, evaluation criteria (as approved by City Council on October 2, 2015) were applied to determine which options would be most appropriate for future implementation. Once the criteria had been applied, a comparative evaluation was completed whereby each option was compared to other options within the same grouping.

A comparative evaluation process was undertaken for each "group" of options (as shown in Table 3-1), including the development of a set of detailed evaluation tables and a comparative ranking table with scores. The detailed evaluation tables can be found in Appendix A.

The results have been organized by option group, which were developed to address a specific gap, challenge, or future opportunity. For each group of options, the following is presented:

- Gap, Challenge and/or Opportunity Addressed;
- Summary of Options Identified;
- Evaluation of Options;
- Comparative Evaluation;
- Recommended Options for Further Consideration; and,
- Implementation Considerations.

A comparative evaluation table is included in the discussion of the evaluation of each group of options. The table has been colour-coded to provide a comparison of each option for each indicator as follows:

- Green shading indicates the option scored High, compared to the other options;
- Yellow shading indicates the option scored Medium, compared to the other options;
- Red shading indicates the option scored Low, compared to the other options;
- N/A indicates the indicator was not applicable to the option.

Within each category (Environmental, Social and Financial) the score for each indicator was averaged to give an overall score for each category compared to other options within the same grouping. The average score for each category was totaled to give an overall score and ranking for each option.

The comparative evaluation tables, summarizing the scores and assessment for each grouping of options can be found in Appendix B.

Additional information on the gaps, challenges and/or opportunities can be found in Technical Memorandum No. 2: Needs Assessment: Vision & Guiding Principles; Gaps, Challenges and/or

Opportunities; and Long-Term Projections[10]. Further details about the each option and the evaluation process can be found in Technical Memorandum No. 3: Options Identification and Evaluation Process.

5.1 Reduction and Reuse Options – Preliminary Evaluation

The following sections provide an overview of the evaluation process for the reduction and reuse options resulting in the identification of recommended options and implementation considerations.

5.1.1 Reduction/Reuse: Gap, Challenge and/or Opportunity Addressed

The following gap(s), challenge(s) and/or opportunity(ies) were identified early in the project as items to be addressed through the Waste Strategy. The options evaluated have been specifically identified to address the following gaps, challenges and/or opportunities;

- 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.

5.1.2 Summary of Reduction/Reuse Options Identified

The following Table 5-1 provides a summary of options identified within this group for evaluation.

Table 5-1: Summary of Reduction/Reuse Options Identified

Option	Brief Summary
Option 2.2: 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: 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

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

Option	Brief Summary
	additional 1% of waste from landfill.
Option 2.4: 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: 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: Explore Opportunities for Waste Exchange	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.

5.1.3 Evaluation of Reduction/Reuse Options

Table 5-2 presents the comparative evaluation of the Reduction/Reuse options.

Table 5-2: Comparative Evaluation of Reduction/Reuse Options

Categories, Criteria & Indicators	**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
Environmental Impact/Benefit					
Local Environmental Impact/Benefit:	High (3)	High (3)	High (3)	High (3)	High (3)
Regional/Global Environmental Impact/Benefit:	High (3)	High (3)	High (3)	High (3)	High (3)
Public Health Impact/Benefit:	High (3)	High (3)	High (3)	Medium (2)	Medium (2)
Potential to Increase Diversion:	High (3)	Medium (2)	Low (1)	Low (1)	Medium (2)

Categories, Criteria & Indicators	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
Waste Hierarchy:	High (3)	High (3)	High (3)	High (3)	High (3)
Ranking	High	High	High	Medium/ High	High
Average Score	3.0	2.8	2.6	2.4	2.6
Social Impact/Benefit					
Approvals Complexity:	High (3)	High (3)	High (3)	Medium (2)	High (3)
Potential for Land Use Conflicts/Community Interruption:	Medium (2)	Medium (2)	Medium (2)	Low (1)	Medium (2)
Collaboration:	High (3)	High (3)	Medium (2)	High (3)	High (3)
Complexity:	Medium (2)	High (3)	Medium (2)	High (3)	Medium (2)
Convenience:	Medium (2)	Medium (2)	Medium (2)	High (3)	Medium (2)
Community Safety:	Medium (2)	Medium (2)	Medium (2)	Medium (2)	Medium (2)
Equity:	High (3)	High (3)	High (3)	High (3)	Medium (2)
Behaviour Change:	High (3)	Medium (2)	Medium (2)	Medium (2)	Medium (2)
Ranking	Medium/ High	Medium/ High	Medium/ High	Medium/ High	Medium/ High
Average Score	2.5	2.5	2.3	2.4	2.3
Financial Impact/Benefit					
Cost:	Medium (2)	Medium (2)	Low (1)	Medium (2)	Medium (2)
Health Care Cost Implications:	High (3)	High (3)	High (3)	High (3)	High (3)
Risk:	High (3)	High (3)	High (3)	High (3)	High (3)
Economic Growth:	Low (1)	Medium (2)	Medium (2)	Low (1)	Medium (2)
Local Job Creation:	Medium (2)	Medium (2)	High (3)	Low (1)	Medium (2)
Flexibility:	Medium (2)	Medium (2)	High (3)	High (3)	High (3)
Ranking	Medium/ High	Medium/ High	Medium/ High	Medium/ High	Medium/ High
Average Score	2.2	2.4	2.5	2.2	2.5

Categories, Criteria & Indicators	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
Ranking	Medium/ High	Medium/ High	Medium/ High	Medium/ High	Medium/ High
Total Score	7.7	7.7	7.4	7.0	7.4

5.1.4 Discussion of Reduction/Reuse Evaluation Results

The comparative evaluation considered the potential impact or benefit each option would have associated with the criteria established for the three categories: Environmental; Social and Financial. The following provides a brief discussion of the results for the five options within the evaluation categories.

- Within the Environmental Category, four out of the five options ranked High while the remaining option ranked Medium/High. Overall, Option 2.2: Food Waste Reduction Strategy scored the highest for all criteria. Option 2.5: Support Reuse Events ranked the lowest due to the lower potential to increase diversion and Public Health impact/benefit.
- In the Social Category, all options ranked Medium/High, with Options 2.2: Food Waste Reduction Strategy and 2.3: Textile Collection and Reuse Strategy scoring just slightly higher than Options 2.5: Support Reuse Events, 2.4: Sharing Library and 2.6: Explore Opportunities for Waste Exchange.
- In the Financial Category, all five options ranked Medium/High; however, their scores differed slightly. Option 2.5: Support Reuse Events ranked lower in the Financial Category due to lower economic growth, lower job creation and unpredictable costs while Option 2.2: Food Waste Reduction Strategy ranked lower due to less potential for economic growth, local job creation and flexibility.

5.1.5 Recommended Reduction/Reuse Options for Further Consideration

Based on the application of the approved evaluation criteria, all of the identified options are recommended for implementation in the future. They all contribute to waste reduction, which is the highest action on the waste hierarchy, and can all work together to become part of a comprehensive waste reduction strategy. It is recommended that the options be phased in over several years.

- Option 2.2: Develop a 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

5.1.6 Reduction/Reuse Implementation Considerations

For each of the recommended options identified above, the following should be considered when developing the best approach to implementation of;

- Option 2.2: Develop a Food Waste Reduction Strategy
    - The City will need to conduct pre and post waste audits focusing on gathering data on avoidable (edible food) and unavoidable (inedible foods such as fruit/vegetable peelings or egg shells) food waste to establish a baseline.
    - Establish an on-going monitoring program to measure results over time.
    - Design of a food waste reduction campaign tailored to meet Toronto's unique characteristics, targeting single family, multi-residential households and City-serviced commercial customers.
    - Review and revise any required City policies to ensure that the food waste reduction strategy and City policies are compatible.
    - Develop a business case which documents the benefits of long-term investment in a food waste reduction strategy and documents savings in collection, processing and disposal costs, as well as environmental benefits of lower food waste quantities over time.
    - Consider partnering with other municipalities on a comprehensive Greater Toronto Area (GTA) wide food waste reduction strategy.
    - Explore partnerships with various appropriate social service organizations, charities and not-for-profit organizations with an interest in food and food waste within City of Toronto.
- Option 2.3: Textile Collection and Reuse Strategy
    - Identify specific textiles within the waste stream that will be the focus of the textile collection and reuse program.
    - Develop a number of pilot projects targeting different types/quality of textile goods (e.g. worn clothing, shoes, handbags) and/or different groups for collection (e.g. schools, markets, retailers) to collect information on the amount of textiles that can realistically be captured.
    - Research market opportunities for these specific textiles to assess the potential for different collection methods (e.g. curbside or at collection bins at City-operated depots or other collection points e.g. community centres).
    - Use results of pilot projects to develop and plan a textile diversion program.

- Conduct market research and develop a messaging campaign, along with a dedicated website and promotional materials, specifically focused on reducing the amount of textiles in the waste stream, and focused on diverting textiles to productive uses, which is consistent with a Circular Economy approach[11].
- Consideration of partnerships with various social service organizations, charities and not-for-profit organizations already involved in textile collection and reuse.

- Option 2.4: Sharing Library

  - Decide if the City wants to develop separate events and/or promote/partner with existing organizations.
  - Research and verify existing or emerging organizations for potential partnerships.
  - Conduct a pilot project to identify suitable locations for sharing libraries; determine items to be shared (e.g. toys); and identify staffing requirements to support program.
  - Use results of pilots to decide on locations of sharing libraries and items to be shared.
  - Track number of items shared to determine success of program and potential impact on diversion.
  - Consider expansion of program to other materials (e.g. baking equipment, sporting goods equipment, board games).

- Option 2.5: Support Reuse Events

  - Review current by-laws that prohibit curbside giveaway events.
  - Identify types of events the City could support and what level of support would be needed.
  - Promote and educate on acceptable items and provide residents with enough notice to set out their reusable items on scheduled days.
  - Determine enforcement approach to manage materials remaining after events.
  - Develop a method to track the material diverted from landfill through the various reuse events.
  - Coordinate with non-profit groups to support collection of left-over reusable goods.

- Option 2.6: Explore Opportunities for Waste Exchange

[11] "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.

- Determine if the City establishes its own waste exchange centre and provides donations to partnering organizations or partners/promotes existing organizations that collect and distribute used materials.
- Advertise/promote waste exchange opportunities through partnerships with City businesses, institutions, non-profit organizations, etc.
- Link program to the Waste Wizard, maintain links, and update information regularly.

5.2 Collection & Drop-off Depots

The following sections provide an overview of the evaluation process for the collection and drop-off options resulting in the identification of recommended options and implementation considerations.

5.2.1 Collection & Drop-off Depots: Gap, Challenge and/or Opportunity Addressed

The following gap(s), challenge(s) and/or opportunity(ies) were identified early in the project as items to be addressed through the Waste Strategy. The options evaluated have been specifically identified as options that address the following gap(s), challenge(s) and/or opportunity(ies);

- Provide City customers with convenient options which promote greater diversion and that are flexible to accommodate changing waste streams and resident accessibility; and,
- The impact of intensification and the changes required to manage additional waste generated by housing units (multi-residential units) with typically lower waste diversion performance records and in areas that are more difficult to collect from using traditional methods.

5.2.2 Summary of Collection & Drop-off Depots Options Identified

The following Table 5-3 provides a summary of options identified within this group for evaluation.

Table 5-3: Summary of Collection & Drop-off Depots Options Identified

Option	Brief Summary
Option 3.3: Stand Alone Drop-off and Reuse Centres	This option calls for up to 10 large scale, one-stop drop off and re-use centres (i.e. about one depot to service a population base of about 200,000 residents). These depots would be City owned and could be operated by City staff or be contracted out to the private sector to own and/or operate on a competitive bid process. These stand alone facilities would replace existing City drop-off depots located at transfer stations and would collect the full range of materials with all of the permitting, volume and odour control requirements this entails. This is an important distinction as compared to neighbourhood waste

Option	Brief Summary
	diversion depots (see Option 3.4) that are not expected to serve as drop-offs for Green Bin organics or residential garbage because of permitting, volume and odour concerns.
Option 3.4: 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 10 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). 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. 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. 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: 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.

Option	Brief Summary
	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.

5.2.3 Evaluation of Collection & Drop-off Depots Options

Table 5-4 presents the comparative evaluation of the Collection & Drop-off Depots options. Option 3.5: Develop a Mobile Drop-off Service for Targeted Divertible Materials resulted in an overall ranking of Medium/High and therefore would be the preferred option.

Table 5-4: Comparative Evaluation of Collection & Drop-off Depots Options

Categories, Criteria & Indicators	**Option 3.3** Develop Stand Alone Drop-off and Reuse Centres	**Option 3.4** Develop a Network of Permanent, Small Scale Neighbourhood Diversion Depots in Convenient Locations	**Option 3.5** Develop a Mobile Drop-off Service for Targeted Divertible Materials
Environmental Impact/Benefit			
Local Environmental Impact/Benefit:	Medium (2)	High (3)	High (3)
Regional/Global Environmental Impact/Benefit:	Medium (2)	Medium (2)	Medium (2)
Public Health Impact/Benefit:	Medium (2)	Medium (2)	Medium (2)
Potential to Increase Diversion:	Medium (2)	Low (1)	Low (1)
Waste Hierarchy:	Medium (2)	Medium (2)	Medium (2)
Ranking	Medium	Medium	Medium
Average Score	2.0	2.0	2.0
Social Impact/Benefit			
Approvals Complexity:	Medium (2)	Medium (2)	Medium (2)
Potential for Land Use Conflicts/Community Interruption:	Low (1)	Medium (2)	Medium (2)
Collaboration:	High (3)	High (3)	High (3)
Complexity:	Medium (2)	Medium (2)	Medium (2)
Convenience:	Low (1)	Low (1)	Medium (2)
Community Safety:	Medium (2)	Medium (2)	Medium (2)
Equity:	Low (1)	High (3)	High (3)
Behaviour Change:	Low (1)	Low (1)	Medium (2)
Ranking	Medium/Low	Medium	Medium/High
Average Score	1.7	2.0	2.3
Financial Impact/Benefit			

Categories, Criteria & Indicators	Option 3.3 Develop Stand Alone Drop-off and Reuse Centres	Option 3.4 Develop a Network of Permanent, Small Scale Neighbourhood Diversion Depots in Convenient Locations	Option 3.5 Develop a Mobile Drop-off Service for Targeted Divertible Materials
Cost:	Low (1)	Medium (2)	High (3)
Health Care Cost Implications:	High (3)	High (3)	High (3)
Risk:	High (3)	High (3)	High (3)
Economic Growth:	Medium (2)	Medium (2)	Low (1)
Local Job Creation:	Medium (2)	Medium (2)	Low (1)
Flexibility:	High (3)	High (3)	High (3)
Ranking	Medium/ High	Medium/High	Medium/High
Average Score	2.4	2.5	2.4
Overall Ranking	**Medium**	**Medium**	**Medium/High**
Total Score	**6.1**	**6.5**	**6.7**

5.2.4 Discussion of Collection & Drop-off Depots Evaluation Results

The comparative evaluation considered the potential impact or benefit each option would have associated with the criteria established for the three categories: Environmental; Social and Financial. The following provides a brief discussion of the results for the three options within the evaluation categories.

- In the Environmental category, all three options ranked and scored equally (Medium).
- Option 3.5: Develop a Mobile Drop-off Service for Targeted Divertible Materials ranked the highest in the Social Category because, as a mobile service that travels to locations throughout the city, it is the most convenient of all the options. The focus of Option 3.5: Mobile Drop-off Service on diverting more materials not collected curbside including textiles, durables and some municipal household and special waste from landfill is also a positive attribute.
- In the Financial Category, all options ranked and scored equally (Medium/High) however, Option 3.4: Develop a Network of Permanent, Small Scale Neighbourhood Diversion Depots in Convenient Locations, scored one point higher than the other two options with a lower cost compared to Option 3.3: Stand Alone Drop-off and Reuse Centres and higher potential for economic and job growth compared to Option 3.5: Develop a Mobile Drop-off Service for Targeted Divertible Materials.

5.2.5 Recommended Collection & Drop-off Depots Options for Further Consideration

Based on the application of the approved evaluation criteria, the following two options are recommended for implementation in the future.

- 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

There is a positive link between Options 3.4: Develop a Network of Permanent, Small Scale Neighbourhood Drop-off Depots in Convenient Locations and 3.5: Develop a Mobile Drop-off Service for Targeted Divertible Materials. It has been recommended that Option 3.5 be planned and implemented first to support research to help locate the 10 or more Neighbourhood Drop-off Depots to be established across the city by 2026. 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 convenience of this combination for city residents is the best option for cost effective and socially positive higher waste diversion, as well as providing the most options to divert materials not currently collected in the curbside or multi-residential services.

The following option is not being recommended for implementation in the future.

- Option 3.3: Develop a Series of Stand Alone Drop-off and Reuse Centres

Overall, this option scored the lowest of the three options. It is a high cost option and there is some concern that large scale stand alone drop-off and reuse centres may draw materials away from the very efficient and cost effective curbside services that the City already provides to its residents. Using the depots would involve travel, generally by car, and it would not be practical for residents to bring large amounts of materials long distance by transit if they did not already have access to a vehicle.

5.2.6 Collection & Drop-off Depots Implementation Considerations

For each of the recommended options identified above, the following should be considered when developing the best approach to implementation of:

- Option 3.4: Develop a Network of Permanent, Small Scale Neighbourhood Drop-off Depots in Convenient Locations
    - The development of 10 or more small Neighbourhood Drop-off Depots across the city reflects the changing nature of Toronto – with more multi-residential units and many residents choosing to not own vehicles - therefore convenient drop-off access close to transit at many locations across the city becomes a more important part of Toronto's future waste system.
    - The complexity of approvals for 10 or more Neighbourhood Drop-off Depots will depend on the range of materials collected at each Centre. For example, their

size, storage space and convenient location will restrict the amount of bulky material that can be received at the Centres.
    - Not allowing residential or small business waste (i.e. garbage and organic materials) will help simplify the approval process. Discouraging the drop-off of materials already collected at the curb will reserve space at the centres for targeted non Blue Bin materials.
    - This approach assumes that materials collected through the Neighbourhood Drop-off Depots will continue to be consolidated and processed at the City transfer stations (as is currently done).
    - In year 2026, a review of the Neighbourhood Drop-off Depots program should be conducted, including an assessment as to whether more Centres should be considered.
    - Over time, an integrated Drop-off depot approach will lead to eliminating public access to drop-off services at existing, large multi-use City transfer stations/drop-off depots.
- Option 3.5: Develop a Mobile Drop-off Service for Targeted Divertible Materials
    - Once the mobile collection service is fully established (and assuming it has been successful at diverting more materials than the current Toxic Taxi service offerings), the City's existing Toxic Taxi and Environment Days programs will need to be modified/rationalized with the mobile service.
    - This approach assumes that materials collected through the new mobile depot service will be processed through the existing system (that services the current Toxic Taxi and Environment Days programs).

As mentioned above, it is recommended that Option 3.5 be planned and implemented first in order to help identify the best locations for the Neighbourhood Drop-off Depots.

5.3 Commissioners Street Transfer Station Options

The planning framework for the Toronto Port Lands has identified that the current usage of the Commissioners Street Transfer Station does not align with future redevelopment plans. A challenge facing the City is the decision needed about how to plan for existing and future services to be replaced.

5.3.1 Commissioners Street Transfer Station: Gap, Challenge and/or Opportunity Addressed

The following gap(s), challenge(s) and/or opportunity(ies) were identified early in the project as items to be addressed through the Waste Strategy. The options evaluated have been specifically identified as options that address the following gap, challenge and/or opportunity;

- A decision is needed about the future of the Commissioners Street Transfer Station; 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 Street Transfer Station will be replaced.

5.3.2 Summary of Commissioners Street Transfer Station Options Identified

The following Table 5-5 provides a summary of options identified within this group for evaluation.

Table 5-5: Summary of Commissioners Street Transfer Station Options Identified

Option	Brief Summary
Option 4.1: Relocation of Commissioners Street 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. 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 4.2: Redirecting Waste to an Existing City of Toronto Transfer Station(s).	All waste-related traffic currently being received at the Commissioners Street Transfer Station would be redirected to an existing City of Toronto transfer station (e.g. Ingram or Bermondsey). Facility design/operation at the receiving facilities may need to be modified or expanded to reflect additional traffic and waste volumes. This may include eliminating some existing services for small waste quantity generators and drop off services, as appropriate.
Option 4.3: Procure Transfer Capacity at a Private Transfer Station in Vicinity of the Port Lands Area, if Available	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.

Option	Brief Summary
	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.

5.3.3 Evaluation of Commissioners Street Transfer Station Options

Table 5-6 presents the comparative evaluation of the Commissioner Street Transfer Station options. Both Options 4.1: Relocation Commissioners Street Transfer Station and 4.3: Procure Transfer Capacity at a Private Transfer Station in Vicinity of the Port Lands Area (if available) resulted in an overall ranking of Medium; however, differed slightly in their overall average score. When considering the application of priorities, both options, Option 4.3: Procure Transfer Capacity at a Private Transfer Station in Vicinity of the Port Lands Area (if available) and Option 4.1: Relocation Commissioners Street Transfer Station ranked equally (Medium) in the Environmental Category, in the Social Category (Medium/Low) and in the Financial Category (Medium). The application of priorities did not identify a preferred option; as a result, two options are being recommended for further consideration.

Option 4.3: Procure Transfer Capacity at a Private Transfer Station in Vicinity of the Port Lands Area (if available) scored the highest of the three options evaluated. The difference between this option and the next highest scoring option, Option 4.1: Relocation Commissioners Street Transfer Station, relates to the Environmental Category. The evaluation of this option 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 transfer 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 or facilities 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: Relocation of Commissioners Street Transfer Station, since it would be essentially the same as developing a new transfer station.

Option 4.1: Relocation of Commissioners Street Transfer Station within the Port Lands Area or Designation of Land for Long-Term Relocation also provides for continuation of the City's existing waste transfer station service within the Port Lands area. The option focused on 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 to 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 as street sweepings from Transportation Services;
- contingency capacity for other transfer stations;
- capacity for vehicle queuing on-site for both City collection vehicles and small private vehicles, including area for loading/unloading;
- logistics related to truck turning movements and storage for large transfer vehicles;
- future capacity to manage greater volumes and types of waste; and,
- capital and operating costs (e.g. would result in increased costs if more collections operations loads are managed or private/residential tipping).

Table 5-6: Comparative Evaluation of Commissioners Street Transfer Station Options

Categories, Criteria & Indicators	Option 4.1 Relocation of Commissioners Transfer Station within the Port Lands Area or Designation of Land for Long-Term Relocation.	Option 4.2 Redirecting Waste to an Existing Transfer Station(s).	Option 4.3 Procure Transfer Capacity at a Private Transfer Station in Vicinity of the Port Lands Area (if available).
Environmental Impact/Benefit			
Local Environmental Impact/Benefit:	Medium (2)	Medium (2)	High (3)
Regional/Global Environmental Impact/Benefit:	High (3)	Medium (2)	High (3)
Public Health Impact/Benefit:	Low (1)	Low (1)	Low (1)
Potential to Increase Diversion:	Low (1)	Low (1)	Low (1)
Waste Hierarchy:	Medium (2)	Medium (2)	Medium (2)
Ranking Average Score	Medium 1.8	Medium/ Low 1.6	Medium 2.0
Social Impact/Benefit			
Approvals Complexity:	Medium (2)	High (3)	High (3)
Potential for Land Use Conflicts/Community Interruption:	Medium (2)	Medium (2)	Medium (2)
Collaboration:	Low (1)	Low (1)	Low (1)
Complexity:	N/A	N/A	N/A
Convenience:	N/A	N/A	N/A
Community Safety:	Medium (2)	Low (1)	Low (1)
Equity:	Medium (2)	Medium (2)	Medium (2)

Categories, Criteria & Indicators	Option 4.1 Relocation of Commissioners Transfer Station within the Port Lands Area or Designation of Land for Long-Term Relocation.	Option 4.2 Redirecting Waste to an Existing Transfer Station(s).	Option 4.3 Procure Transfer Capacity at a Private Transfer Station in Vicinity of the Port Lands Area (if available).
Behaviour Change:	Low (1)	Low (1)	Low (1)
Ranking	Medium/Low	Medium/ Low	Medium/Low
Average Score	1.7	1.7	1.7
Financial Impact/Benefit			
Cost:	Low (1)	High (3)	Medium (2)
Health Care Cost Implications	Medium (2)	Medium (2)	Medium (2)
Risk:	High (3)	High (3)	Medium (2)
Economic Growth:	Medium (2)	Low (1)	Low (1)
Local Job Creation:	Medium (2)	Low (1)	Medium (2)
Flexibility:	Medium (2)	Medium (2)	Medium (2)
Ranking	Medium	Medium	Medium
Average Score	2.0	2.0	1.9
Overall Ranking	Medium	Medium/ Low	Medium
Total Overall Score	5.5	5.3	5.6

5.3.4 Discussion of Commissioners Street Transfer Station Evaluation Results

The comparative evaluation considered the potential impact or benefit each option would have associated with the criteria established for the three categories: Environmental; Social and Financial. The following provides a brief discussion of the results for the three options within the evaluation categories.

- Within the Environmental Category, Option 4.3: Procure Transfer Capacity at a Private Transfer Station in Vicinity of the Port Lands Area (if available) scored the highest. The main difference between Option 4.3: Procure Transfer Capacity at a Private Transfer Station in Vicinity of the Port Lands Area (if available) and Option 4.1: Relocation of Commissioners Street Transfer Station within the Port Lands Area or Designation of Land for Long-Term Relocation was the Local Environmental Impact/Benefit criterion. Option 4.1 received a lower score due to the requirement for land area in the order of 56 hectares, to establish a new transfer station resulting in land use displacement whereas

Option 4.3 is based on an already existing facility. Option 4.2: Redirecting Waste to an Existing Transfer Station(s) scored the lowest in this evaluation category and specifically Local Environmental Impact and Regional/Global Environmental Impact associated with collection vehicles consuming more fuel and increased contributions to greenhouse gas emissions as a result of having to travel greater distances.

- In the Social Category, all three options received the same overall score with some minor differences in the scoring for the individual criteria. Option 4.1: Relocation of Commissioners Street Transfer Station within the Port Lands Area or Designation of Land for Long-Term Relocation scored the lowest for Approvals Complexity largely since a new facility would need to be established. This option did however score higher for Community Safety as the other two options would increase the number of vehicles travelling to already existing transfer station locations.
- Within the Financial Category, Options 4.2: Redirecting Waste to an Existing City of Toronto Transfer Station(s). and 4.1: Relocation of Commissioners Street Transfer Station within the Port Lands Area or Designation of Land for Long-Term Relocation scored the same, just slightly higher than Option 4.3: Procure Transfer Capacity at a Private Transfer Station in Vicinity of the Port Lands Area. Option 4.2 is expected to have the least impact on cost to the City, with Option 4.1 having the highest cost mainly due to development of a new facility and its ongoing operation. There is some contract risk for Option 4.3: Procure Transfer Capacity at a Private Transfer Station in Vicinity of the Port Lands Area (if available) compared to the other two options since this involves a private facility not controlled by the City. Option 4.1 scored higher for economic growth with greater potential to provide convenient and cost effective support for the ongoing growth in the City's downtown core. Local job creation is expected to be comparable for Option 4.3: Procure Transfer Capacity at a Private Transfer Station in Vicinity of the Port Lands Area (if available) and 4.1: Relocation of Commissioners Street Transfer Station, but lower for Option 4.2: Redirecting Waste to an Existing City of Toronto Transfer Station(s). based on the City's already existing transfer facilities.

5.3.5 Recommended Commissioners Street Transfer Station Options for Further Consideration

Based on the application of the approved evaluation criteria and utilizing priorities where applicable to identify differences between the options, the following are recommended for further consideration.

- Option 4.3: Procure Transfer Capacity at a Private Transfer Station in Vicinity of the Port Lands Area (if available)

- Option 4.1: Relocation of Commissioners Street Transfer Station within the Port Lands Area or Designation of Land for Long-Term Relocation.

However, 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, only Option 4.1 is being recommended for implementation.

The following option is not being recommended for implementation in the future.

- Option 4.2: Redirecting Waste to an Existing City of Toronto Transfer Station(s)

This option scored the lowest of the three options evaluated and is not being recommended for further consideration. The lower score relates to the Environmental Impact/Benefit criteria category and the potential for increased impacts to the local airshed and additional greenhouse gas contributions due to the increased travel distance of collection vehicles to other City transfer stations. This option would result in additional travel distance for collection vehicles to an existing City transfer station, either the Bermondsey Transfer Station or Ingram Transfer Station, increasing the time required for a collection vehicle to complete its route and adding to any existing traffic congestion on City streets. An assessment of the ability for an existing transfer station to accommodate additional traffic and waste volumes and the need for any building or site modifications would also be required in order to give this option further consideration.

5.3.6 Commissioners Street Transfer Station Implementation Considerations

For the recommended option identified above, the following should be considered when developing the best approach to implementation of:

- Option 4.1: Relocation of Commissioners Street Transfer Station within the Port Lands Area or Designation of Land for Long-Term Relocation
    - City to identify and confirm availability of an acceptable land parcel within the Port Lands area to develop a waste transfer station in consultation with SWMS.
    - A conceptual design and site plan to be developed to confirm operating capabilities and procedures for the identified site.
    - Preparation of Environmental Compliance Approval (ECA) and land use approvals applications and supporting documentation. Associated facility approvals are followed by construction.

5.4 Materials and Energy Recovery

The following sections provide an overview of the evaluation process for the materials and energy recovery options resulting in the identification of recommended option(s) and implementation considerations.

5.4.1 Materials and Energy Recovery: Gap, Challenge and/or Opportunity Addressed

The following gap(s), challenge(s) and/or opportunity(ies) were identified early in the project as items to be addressed through the Waste Strategy. The options evaluated have been specifically identified as options that address the following gap(s), challenge(s) and/or opportunity(ies);

- Alternative processing technologies could divert additional materials from disposal and extend the life of the Green Lane Landfill.
- 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.

5.4.2 Summary of Materials and Energy Recovery Options Identified

The following Table 5-7 provides a summary of options identified within this group for evaluation.

Table 5-7: Summary of Materials and Energy Recovery Options Identified

Option	Brief Summary
Option 6.1: Mixed Waste Processing Facility Development	Development of a Mixed Waste Processing facility which uses mechanical based processing equipment to recover recyclable material from a mixed or unsorted waste stream.
Option 6.2: 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. 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.
Option 6.3: Direct Combustion Facility Development	Development of a direct combustion facility to process residual wastes and recover recyclable materials and energy derived from heating water to create steam and/or electricity.
Option 6.4: Emerging Technologies Facility Development	Development of a facility utilizing a new and emerging technology (including gasification, pyrolysis, plasma arc) to process the City's residual waste and either produce additional materials (e.g. syngas, chemical by-products) or to recover other products (e.g. metals). Many of these technologies do not currently process waste at a commercial scale, but could be considered for the future.
Option 6.5: Organics Recycling Biocell or Biomodule	Development of a dedicated cell or controlled area at an existing landfill (i.e. Green Lane Landfill) to be used for

Option	Brief Summary
Development	the processing of a relatively high percentage organic content residual waste stream including a residual mixed waste stream or contaminated source separated organics stream from multi-residential buildings. Rapid biodegradation of organic material allows for enhanced capture and recovery of biogas and earlier stabilization of organic material suitable for alternative applications.
Option 6.6: Refuse Derived Fuel Facility Development	Development of a refuse derived fuel (RDF) facility to process solid waste into a refined, homogenous solid fuel that can then be used by a thermal process to produce energy, or alternatively as a soil amendment in some applications. This technology can process the waste stream to either produce a RDF fluff, pellet or briquette.
Option 6.7: Waste to Liquid Fuel Technologies Facility Development	Development of a facility utilizing technologies such as hydrolysis, pyrolysis, gasification etc. to transform a mixed residual waste stream to a liquid fuel source.

5.4.3 Evaluation of Materials and Energy Recovery Options

Table 5-8 presents the comparative evaluation of the Materials and Energy Recovery options. Three options had an overall ranking of Medium; and four options had an overall ranking of Medium/Low. When considering the application of priorities, both Option 6.5: Organics Recycling Biocell or Biomodule and Option 6.2: Mixed Waste Processing with Organics Recovery Facility Development ranked as Medium/High in the Environmental Category. In the Social Category, Option 6.5: Organics Recycling Biocell or Biomodule ranked the highest (Medium) and therefore, would be the preferred option by.

As discussed in the following sections, Option 6.5: Organics Recycling Biocell or Biomodule is only applicable to a small subset of the City's waste and does not fully meet the associated Gaps, Challenges and/or Opportunities associated with Materials and Energy Recovery. For this reason, Option 6.2: Mixed Waste Processing with Organics Recovery Facility Development was the preferred option.

Table 5-8: Comparative Evaluation of Materials and Energy Recovery Options

Categories, Criteria & Indicators	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.	Option 6.6 Refuse Derived Fuel Facility Development.	Option 6.7 Waste to Liquid Fuel Technologies Facility Development.
Environmental Impact/Benefit							
Local Environmental Impact/Benefit:	Medium (2)	Medium (2)	Medium (2)	Medium (2)	High (3)	Medium (2)	Medium (2)
Regional/Global Environmental Impact/Benefit:	Medium (2)	High (3)	High (3)	High (3)	High (3)	High (3)	High (3)
Public Health Impact/Benefit:	Low (1)	Low (1)	Low (1)	Low (1)	Medium (2)	Low (1)	Low (1)
Potential to Increase Diversion:	Medium (2)	High (3)	Medium (2)	Medium (2)	Low (1)	Medium (2)	Medium (2)
Waste Hierarchy:	Medium (2)	Medium (2)	Medium (2)	Medium (2)	Medium (2)	Medium (2)	Medium (2)
Ranking	Medium	Medium/ High	Medium	Medium	Medium/ High	Medium	Medium
Average Score	1.8	2.2	2.0	2.0	2.2	2.0	2.0
Social Impact/Benefit							
Approvals Complexity:	Medium (2)	Medium (2)	Low (1)	Low (1)	Medium (2)	Medium (2)	Low (1)
Potential for Land Use Conflicts/Community Interruption:	Low (1)	Low (1)	Medium (2)	Medium (2)	High (3)	Low (1)	Medium (2)
Collaboration:	Medium (2)	Medium (2)	Medium (2)	Medium (2)	Low (1)	Medium (2)	Medium (2)
Complexity:	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Convenience:	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Community Safety:	Medium (2)	Medium (2)	Medium (2)	Medium (2)	Medium (2)	Medium (2)	Medium (2)

Categories, Criteria & Indicators	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.	Option 6.6 Refuse Derived Fuel Facility Development.	Option 6.7 Waste to Liquid Fuel Technologies Facility Development.
Equity:	Medium (2)	Medium (2)	Medium (2)	Medium (2)	High (3)	Medium (2)	Medium (2)
Behaviour Change:	Low (1)	Low (1)	Low (1)	Low (1)	Low (1)	Low (1)	Low (1)
Ranking	Medium/ Low	Medium/ Low	Medium/ Low	Medium/ Low	Medium	Medium/ Low	Medium/ Low
Average Score	1.7	1.7	1.7	1.7	2.0	1.7	1.7
Financial Impact/Benefit							
Cost:	Medium (2)	Medium (2)	Low (1)	Low (1)	High (3)	Medium (2)	Low (1)
Health Care Cost Implications:	Medium (2)	Medium (2)	Medium (2)	Medium (2)	High (3)	Medium (2)	Medium (2)
Risk:	Low (1)	Low (1)	Medium (2)	Low (1)	Low (1)	Low (1)	Low (1)
Economic Growth:	Medium (2)	Medium (2)	Medium (2)	Low (1)	Low (1)	Low (1)	Low (1)
Local Job Creation:	Low	Medium (2)	Low (1)	Low (1)	Low (1)	Low (1)	Low (1)
Flexibility:	High (3)	High (3)	Low (1)	Medium (2)	Low (1)	Low (1)	Medium (2)
Ranking	Medium	Medium	Medium/ Low	Medium/ Low	Medium/ Low	Medium/ Low	Medium/ Low
Average Score	2.0	2.0	1.5	1.4	1.7	1.4	1.4
Overall Ranking	**Medium**	**Medium**	**Medium/ Low**	**Medium/ Low**	**Medium**	**Medium/ Low**	**Medium/ Low**
Total Score	**5.5**	**5.9**	**5.2**	**5.1**	**5.9**	**5.1**	**5.1**

5.4.4 Discussion of Materials and Energy Recovery Evaluation Results

The comparative evaluation considered the potential impact or benefit each option would have associated with the criteria established for the three categories: Environmental; Social and Financial. The following provides a brief discussion of the results for the seven options within the evaluation categories.

- In the Environmental Category, when the Environmental criteria were applied to all the options, only two options, Option 6.2: Mixed Waste Processing with Organics Recovery Facility Development and Option 6.5: Organics Recycling Biocell or Biomodule ranked Medium/High; all the rest ranked Medium. Option 6.5 ranked higher due to local environmental impact/benefit; whereas Option 6.2 ranked higher for the potential to increase diversion. It should be noted however; that Option 6.5 is only applicable to a small portion of the waste stream and poses minimal environmental impacts at its location at Green Lane Landfill (GLL). All the other options would process a wider variety of materials and would be larger facilities, and thus would have the potential for greater impacts.
- In the Social Category, most of the options had similar scores (Medium or Medium/Low). Option 6.5: Organics Recycling Biocell or Biomodule scored very slightly higher due to less potential for land use disruption as the site would be existing (i.e. located at GLL) and higher for the equity criterion as there would be minimal to no impact to residents with processing a subset of waste at GLL.
- For the Financial Category, Options 6.1: Mixed Waste Processing Facility Development and 6.2: Mixed Waste Processing with Organics Recovery Facility Development were the highest ranking options, with a Medium ranking. This is due to a combination of cost, higher local economic growth and job creation potential, and the flexibility of the operation. The majority of the options in this category ranked Low due to risk and lack of economic growth and local job creation.

5.4.5 Recommended Materials and Energy Recovery Options for Further Consideration

Based on the application of the approved evaluation criteria, the identified option below is recommended for implementation in the future.

- Option 6.2: Mixed Waste Processing with Organics Recovery Facility Development

Although Option 6.5: Organics Recycling Biocell or Biomodule was the highest ranking option, it does not meet the identified gap, challenge and /or opportunity as well as the next highest ranking option (Option 6.2: Mixed Waste Processing with Organics Recovery Facility Development). Option 6.5 can only process a subset of Toronto's waste (e.g. organics) and does not offer as much waste diversion potential as the development of a processing facility. For this reason, Option 6.5 was not carried forward for further consideration. Options 6.3: Direct

Combustion Facility Development, 6.4: Emerging Technologies Facility Development, and 6.7: Waste to Liquid Fuels Technologies Facilities Development could be considered in the future following the successful establishment of the recommended option as a means to further process the residual material from the Mixed Waste Processing with Organics Recovery Facility.

5.4.6 Materials and Energy Recovery Implementation Considerations

For the recommended option identified above, the following should be considered when developing the best approach to implementation of;

- Option 6.2: Mixed Waste Processing with Organics Recovery Facility Development
    - The City would need to acquire assorted approvals and construction of a new Mixed Waste Processing with Organics Recovery Facility on a property located within an industrial zoned area.
    - The facility would still require landfill disposal for some portion of the remaining waste stream.
    - Compost produced may be low-grade and not likely to meet Class A requirements for unrestricted use compost.
    - The City will need to identify an end-market or end use for compost/digestate.

5.5 Residual Waste Disposal

The following sections provide an overview of the evaluation process for the residual waste disposal options resulting in the identification of recommended options and implementation considerations.

5.5.1 Residual Waste Disposal: Gap, Challenge and/or Opportunity Addressed

The following gap(s), challenge(s) and/or opportunity(ies) were identified early in the project as items to be addressed through the Waste Strategy. The options evaluated have been specifically identified as options that address the following gap(s), challenge(s) and/or opportunity(ies);

- 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 Strategy.

5.5.2 Summary of Residual Waste Disposal Options Identified

The following Table 5-9 provides a summary of options identified within this group for evaluation.

Table 5-9: Summary of Residual Waste Options Identified

Option	Brief Summary
Option 7.1: Landfill Expansion	Consider the possibility of expanding the Green Lane

Option	Brief Summary
	Landfill (GLL) in the event that additional residual waste disposal capacity is required. This option is being evaluated as part of a future consideration and not as an immediate need. Expanding the current landfill site will involve an Individual Environmental Assessment (EA) during which time a range of alternatives would be identified and evaluated along with extensive consultation efforts.
Option 7.3: Bio-reactor Landfill	This option considers developing a bio-reactor landfill on both the closed and yet to be constructed landfill cells of the GLL site. A bio-reactor landfill accelerates the biological decomposition of organic wastes in a landfill by promoting conditions necessary for the microorganisms to degrade the waste. Liquids (i.e. leachate, gas condensate, water, storm water runoff, wastewater treatment sludges) must be added to the waste mass and recirculated to obtain optimal moisture for organics decomposition. The bio reactor allows for faster degradation and stabilization of the waste mass combined with generation of landfill gas. Additional disposal capacity is available within the approved landfill design contours prior to closure due to the resulting settlement of the waste.
Option 7.5: 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. 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 7.6: Purchase a New Landfill	This option looks at the possibility of purchasing another licensed landfill site with potential or available approved disposal capacity in Ontario when there is a need for additional residual waste disposal capacity or to preserve the life of the Green Lane Landfill.
Option 7.7a: Securing Disposal Capacity to Preserve Long-Term Landfill Capacity at Green Lane	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-

Option	Brief Summary
Landfill	term landfill capacity at GLL. 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.
Option 7.7b: Securing Disposal Capacity for Residual Management Following Green Lane Landfill Reaching its Approved Disposal Capacity.	This option looks at acquiring/securing landfill airspace from private/municipal landfill sites or other disposal facilities (e.g. Energy from Waste) as a long-term solution to residual management once GLL has reached its approved disposal capacity.
Option 7.8: Greenfield Landfill	This option considers the possibility of identifying a suitable site, and obtaining approval, for a new greenfield landfill site (i.e. a site not previously used for waste disposal) in Ontario to meet the City of Toronto's long term requirements for residual waste disposal capacity.

5.5.3 Evaluation of Residual Waste Disposal Options

Table 5-10 presents the comparative evaluation of the Residual Waste Disposal options. Three options had an overall ranking of Medium and the remaining four options each were ranked Medium/Low. When considering the application of priorities, Option 7.5: Adjust Tipping Fees or Customer Base ranked highest (Medium) overall in the Environmental Category, followed by 7.3: Bio-reactor Landfill, Option 7.6: Purchase a New Landfill, Option 7.7a: Securing Disposal Capacity to Preserve Long-Term Landfill Capacity at Green Lane Landfill and 7.7b: Secure Capacity Once GLL Has Reached Capacity and (all tied for second with a ranking of Medium/Low). Options 7.5, 7.6 7.7a, and 7.7b all ranked Medium in the Social Category. In the financial category, Options 7.7a and 7.7b ranked the highest (High) compared to all other options. As a result of the application of these priorities, Option 7.5: Adjust Tipping Fees or Customer Base is preferred along with Options 7.7a: Securing Disposal Capacity to Preserve Long-Term Landfill Capacity at Green Lane Landfill, and 7.7b: Securing Disposal Capacity for Residual Management Following Green Lane Landfill Reaching its Approved Disposal Capacity.

Table 5-10: Comparative Evaluation of Residual Waste Options

	Near Term Options		Long Term Options				
Categories, Criteria & Indicators	**Option 7.1** Landfill Expansion	**Option 7.3** Bio-Reactor Landfill	**Option 7.5** Adjust Tipping Fees or Customer Base	**Option 7.6** Purchase a New Landfill	**Option 7.7a** Securing disposal capacity to preserve long-term landfill capacity at GLL	**Option 7.7b** Securing disposal capacity for residual management following GLL reaching its approved disposal capacity	**Option 7.8** Greenfield Landfill
Environmental Impact/Benefit							
Local Environmental Impact/Benefit:	Low (1)	Medium (2)	High (3)	Medium (2)	Medium (2)	Medium (2)	Low (1)
Regional/Global Environmental Impact/Benefit:	Medium (2)	Medium (2)	Medium (2)	Medium (2)	Medium (2)	Medium (2)	Medium (2)
Public Health Impact/Benefit:	Low (1)	Low (1)	Medium (2)	Low (1)	Low (1)	Low (1)	Low (1)
Potential to Increase Diversion:	Low (1)	Low (1)	Low (1)	Low (1)	Low (1)	Low (1)	Low (1)
Waste Hierarchy:	Low (1)	Low (1)	Low (1)	Low (1)	Low (1)	Low (1)	Low (1)
Ranking	Low	Medium/ Low	Medium	Medium/ Low	Medium/ Low	Medium/ Low	Low
Average Score	1.2	1.4	1.8	1.4	1.4	1.4	1.2
Social Impact/Benefit							
Approvals Complexity:	Low (1)	Medium (2)	High (3)	Medium (2)	High (3)	High (3)	Low (1)
Potential for Land Use Conflicts/Community Interruption:	Low (1)	Medium (2)	Medium (2)	Medium (2)	Medium (2)	Medium (2)	Low (1)
Collaboration:	Medium (2)	Low (1)	Low (1)	Medium (2)	Low (1)	Low (1)	High (3)
Complexity:	N/A	N/A	Medium (2)	N/A	N/A	N/A	N/A
Convenience:	N/A	N/A	Low (1)	N/A	N/A	N/A	N/A

	Near Term Options		Long Term Options				
Categories, Criteria & Indicators	**Option 7.1** Landfill Expansion	**Option 7.3** Bio-Reactor Landfill	**Option 7.5** Adjust Tipping Fees or Customer Base	**Option 7.6** Purchase a New Landfill	**Option 7.7a** Securing disposal capacity to preserve long-term landfill capacity at GLL	**Option 7.7b** Securing disposal capacity for residual management following GLL reaching its approved disposal capacity	**Option 7.8** Greenfield Landfill
Community Safety:	Medium (2)	Medium (2)	Medium (2)	Medium (2)	Medium (2)	Medium (2)	Low (1)
Equity:	Medium (2)	Medium (2)	Medium (2)	Medium (2)	Medium (2)	Medium (2)	Medium (2)
Behaviour Change:	Low (1)	Low (1)	Medium (2)	Low (1)	Low (1)	Low (1)	Low (1)
Ranking	Medium/ Low	Medium/ Low	Medium	Medium	Medium	Medium	Medium/ Low
Average Score	1.5	1.7	1.9	1.9	1.9	1.9	1.5
Financial Impact/Benefit							
Cost:	Low (1)	Medium (2)	High (3)	Low (1)	Medium (2)	Medium (2)	Low (1)
Health Care Cost Implications	Medium (2)	Medium (2)	High (3)	Medium (2)	Medium (2)	Medium (2)	Medium (2)
Risk:	Low (1)	Low (1)	Medium (2)	Medium (2)	High (3)	High (3)	Low (1)
Economic Growth:	Medium (2)	Low (1)	Low (1)	Medium (2)	Medium (2)	Medium (2)	Low (1)
Local Job Creation:	Low (1)	Low (1)	Low (1)	Low (1)	Low (1)	Low (1)	Low (1)
Flexibility:	High (3)	Low (1)	Low (1)	High (3)	High (3)	High (3)	High (3)
Ranking	Medium/ Low	Medium/ Low	Medium	Medium	Medium/ High	Medium/ High	Medium/ Low
Average Score	1.7	1.4	1.9	1.9	2.2	2.2	1.7

	Near Term Options		Long Term Options				
Categories, Criteria & Indicators	**Option 7.1** Landfill Expansion	**Option 7.3** Bio-Reactor Landfill	**Option 7.5** Adjust Tipping Fees or Customer Base	**Option 7.6** Purchase a New Landfill	**Option 7.7a** Securing disposal capacity to preserve long-term landfill capacity at GLL	**Option 7.7b** Securing disposal capacity for residual management following GLL reaching its approved disposal capacity	**Option 7.8** Greenfield Landfill
Overall Ranking	Medium/ Low	Medium/ Low	Medium	Medium/ Low	Medium	Medium	Medium/ Low
Average Score	4.4	4.5	5.6	5.2	5.5	5.5	4.4

5.5.4 Discussion of Residual Waste Disposal Evaluation Results

The comparative evaluation considered the potential impact or benefit each option would have associated with the criteria established for the three evaluation categories: Environmental; Social and Financial. The following provides a brief discussion of the results for the five options within the evaluation categories.

- Within the Environmental Category, Option 7.5: Adjust Tipping Fees or Customer Base ranked the highest (Medium), primarily due to a reduced local environmental impact/benefit. Options 7.3: Bio-reactor Landfill, Option 7.6: Purchase a New Landfill, 7.7a: Securing Disposal Capacity to Preserve Long-Term Landfill Capacity at Green Lane Landfilland 7.7b: Securing Disposal Capacity for Residual Management Following Green Lane Landfill Reaching its Approved Disposal Capacity all ranked Medium/Low. The main difference between the options was that Option 7.5 has a higher potential to benefit the local environment due to the City disposing less waste on an annual basis at GLL. Options 7.1: Landfill Expansion and 7.8: Greenfield Landfill scored lowest due to potentially greater impacts on the local environment.
- When the Social impacts of the options were considered, all options ranked Medium or Medium/Low. Four options ranked Medium and scored the same (i.e. Options 7.5: Adjust Tipping Fees or Customer Base, 7.6: Purchase a New Landfill, 7.7a: Securing Disposal Capacity to Preserve Long-Term Landfill Capacity at Green Lane Landfill, 7.7b: Secure Capacity once GLL has Reached Capacity), since they were less complex in terms of the approvals process and had lower potential for land use conflicts. Option 7.5: Adjust Tipping Fees or Customer Base had some additional impacts related to convenience and complexity for small private waste generators, which lowered its score. Options 7.1: Landfill Expansion, 7.3: Bio-reactor Landfill and 7.8: Greenfield Landfill scored lowest due to potential for increased impacts associated with most of the Social criteria.
- For Financial impacts, Options 7.7a: Securing Disposal Capacity to Preserve Long-Term Landfill Capacity at Green Lane Landfill and 7.7b: Securing Disposal Capacity for Residual Management Following Green Lane Landfill Reaching its Approved Disposal Capacity had the highest ranking (Medium/High) and scores. This is due to the low level of risk to the City with these options and the increased flexibility of the operation to accommodate future changes. Option 7.5: Adjust Tipping Fees or Customer Base and Option 7.6: Purchase a New Landfill both ranked Medium with all other options ranking Medium/Low.

5.5.5 Recommended Residual Waste Disposal Options for Further Consideration

The options considered and evaluated include options that can be implemented both in the near-term and over a longer period of time. These options are distinctly different and achieve residual disposal capacity either by extending the life of the Green Lane Landfill or by providing new future disposal capacity. Based on the application of the approved evaluation criteria, the identified options are recommended for implementation to address these timelines.

Near-Term Options

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

Long-Term Options for Future Consideration

- Option 7.1: Landfill Expansion
- Option 7.6: Purchase a New Landfill
- Option 7.7b: Securing Disposal Capacity for Residual Management Following GLL Reaching its Approved Disposal Capacity
- Option 7.8: Greenfield Landfill

Option 7.3: Bio-reactor Landfill is not recommended for implementation in the future. This option scored the lowest, providing only limited long-term residual disposal capacity with the highest risk and least benefits.

5.5.6 Residual Waste Disposal Implementation Considerations

For each of the recommended options identified above, the following should be considered when developing the best approach to implementation of;

Near-Term Options

- Option 7.5: Adjust Tipping Fees or Customer Base
  - Consideration needs to be given to a potential for a corresponding increase in GLL operating costs with a reduction in waste volumes.
  - An increase in tipping fee may not significantly lower the tonnage received by the City as small waste generators may have very limited access to alternatives available through the private sector.
  - Approval from City Council is required to adjust tipping fees.
- Option 7.7a: Securing Disposal Capacity to Preserve Long-Term Landfill Capacity at GLL
  - Savings in landfill development, operations, closure and post-closure care costs which are extended over a longer time period. Reduced volumes at GLL may result in an increase in per tonne operating costs due to reduced equipment and resource efficiencies.
  - City already has in place contracts with private sector service providers to implement this option.
  - Need to determine minimum or baseline quantity of waste to continue to be disposed and landfilled at GLL to maintain the efficient operation of the landfill. Reduced volumes at GLL may result in an increase in per tonne operating costs due to reduced equipment and resource efficiencies.

Long-Term Options

- Four options have been identified for future 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: Securing Disposal Capacity for Residual Management Following Green Lane Landfill Reaching its Approved Disposal Capacity, 7.8: Greenfield Landfill), the disposal capacity will require that an Environmental Assessment is completed. This will take a period of several years for Options 7.1: Landfill Expansion and 7.8: Greenfield Landfill, which would be undertaken by the City. Options 7.6: Purchase a New Landfill and 7.7b: Securing Disposal Capacity for Residual Management Following Green Lane Landfill Reaching its Approved Disposal Capacity 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 the GLL and the potential to implement these four long-term residual waste disposal capacity options. For this reason, no one long-term option has been recommended for implementation at this time.

5.6 Multi-residential Services

The following sections provide an overview of the evaluation process for the multi-residential services options resulting in the identification of recommended option(s) and implementation considerations. It is important to note that these options specifically apply to the multi-residential sector, however, there are many other options being considered that apply to the entire system that would also impact the multi-residential sector (e.g. enforcement).

5.6.1 Multi-residential Services: Gap, Challenge and/or Opportunity Addressed

The following gap(s), challenge(s) and/or opportunity(ies) were identified early in the project as items to be addressed through the Waste Strategy. The options evaluated have been specifically identified as options that address the following gap(s), challenge(s) and/or opportunity(ies);

- Solid Waste Services for the 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: 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.

5.6.2 Summary of Multi-residential Services Options Identified

The following Table 5-11 provides a summary of options identified within this group for evaluation. The table is divided into three categories corresponding with organics management, waste collection methods, and planning, policies and enforcement.

Table 5-11: Summary of Multi-residential Services Options Identified

Option	Brief Summary
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.
Option 5.1: On-Site Organics Processing	This option looks at the different roles the City could provide to encourage the use of on-site small scale aerobic or anaerobic digestion technologies to process organic waste generated at multi-residential buildings. The resultant compost product can be used by the participating building(s), neighbouring community gardens or in neighbouring areas. The City's role could be to provide guidance on types of organics processing technologies for different building characteristics (e.g., number of units, space available), how to participate in the program and the benefits of managing organics on-site, how to effectively and safely produce compost (e.g., ideal feedstock, monitoring requirements), and how/where finished product can be used. Initially, the City could implement a pilot program at one or more buildings to test out the effectiveness of on-site organic processing technology(ies) and program(s).
Option 5.2: In-Sink Disposal Units	Review the application of in-sink disposal units in the City in place of source separated collection for the diversion of food scraps that are accepted in the Green Bin program, particularly for multi-residential buildings. This would include an amendment to the current by-law to allow use in areas of the City that have combined sewers.
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

Option	Brief Summary
	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.
Option 3.2a: Alternative Collection Methods for Multi-residential Buildings - One Container System	Use of alternative approaches to collect waste from multi-residential buildings including approaches to implementing alternative technologies to increase convenience for customers to dispose their waste. An example is allowing residents to place source separated waste (e.g., Green Bin organics, Blue Bin materials, residual waste) into one collection location (e.g., bin, chute) using different coloured bags. Residents would not be required to take the three different streams of waste to potentially three different locations or containers thereby creating increased convenience. Sorting of waste is done optically at a facility according to the colour of the bag and the sorted waste is hauled to the appropriate disposal or processing facility.
Option 3.2b: Alternative Collection Methods for Multi-residential Buildings - Vacuum System	Use of alternative approaches to collect waste from multi-residential buildings including approaches to implementing alternative technologies to increase convenience for customers to dispose their waste. An example includes placing waste in an inlet that is connected to an underground piping system that uses a vacuum to transport the waste to a central (possibly off-site) location.
Option 3.7: Multi-Residential Collection using Alternative Vehicles	The City of Toronto could address current service restrictions to some multi-residential buildings by using a fleet of smaller collection vehicles to access multi-residential developments with space restrictions. This option addresses a need for provision of collection service (e.g. garbage, Blue Bin materials, Green Bin organics, bulky wastes, electronic wastes) to multi-residential buildings, which currently do not receive City service due to service restrictions (e.g. narrow lanes, short turning radius, space restrictions). The smaller vehicles would be automated or semi-automated and capable of collecting two-thirds the volume of standard front end collection vehicles. Toronto would purchase and operate the small collection vehicles and require building owners to purchase special collection bins compatible with these vehicles.

Option	Brief Summary
Option 9.1: Elimination of Collection Service to Multi-residential Buildings	The City of Toronto would transition away from collection service to over 4,500 multi-residential buildings currently serviced by the City, and financed through the utility. All of these buildings would need to obtain service from private sector haulers. With multi-residential buildings no longer a City customer, the City loses an opportunity for requiring recycling and source separated organics collection at these locations. However, this approach over time would simplify the utility and the City would focus on single family residential.
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 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. 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: 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. 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.

5.6.3 Evaluation of Multi-residential Services Options

Table 5-12 presents the comparative evaluation of the multi-residential services options. The evaluation of multi-residential options has been divided into three categories of options:

- Organics management;
- Waste Collection methods; and
- Planning, policies and enforcement.

Organics Management

For the Organics management options, three options were compared against each other:

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

For managing organics, Table 5-12 shows that Option 2.7: Community/Mid-Scale Composting achieved an overall ranking of Medium/High, whereas the other two options, Option 5.1: On-site Organics Processing and Option 5.2: In-sink Disposal Units had an overall ranking of Medium Therefore, Option 2.7 ranked higher in all three categories, primarily due to Public Health benefits and opportunities for collaboration, and therefore would be the option carried forward for further consideration.

Waste Collection Methods

Five different collection method options were considered for multi-residential buildings:

- Option 3.1: Container Management (through technologies such as RFID on bins);
- 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, and
- Option 9.1: Elimination of Collection service to Multi-residential Buildings.

Among the five options, Options 3.1: Container Management and 3.2b: Alternative Collection Methods for Multi-residential Buildings - Vacuum System both had an overall ranking of Medium/High; Options 3.2a: Alternative Collection Methods for Multi-residential Buildings - One Container System and 3.7: Multi-residential Collection using Alternative Vehicles had an overall ranking of Medium, and Option 9.1: Elimination of Collection Service to Multi-residential Buildings scored Medium. Applying environmental priorities to the two highest ranking options (Options 3.1: Container Management and 3.2b: Alternative Collection Methods for Multi-residential Buildings - Vacuum System), both options had the same ranking (Medium) with the same score. Applying the next sets of priorities, both options ranked as Medium/High for the

social and financial categories. The application of priorities did not identify a preferred option; however, only Option 3.1: Container Management has been carried forward for further consideration. Option 3.2b: Alternative Collection Methods for Multi-residential Buildings - Vacuum System may be an option considered by the private sector.

Planning, policies and enforcement.

The third set of multi-residential options relates to planning, policies and enforcement and includes:

- Option 1.8: Multi-residential By-laws and Enforcement
- Option 1.9: Updates to Current Multi-residential Development Standards

Option 1.9: Updates to Current Multi-residential Development Standards had an overall ranking of Medium/High, predominantly due to higher rankings for social impacts compared to Option 1.8: Multi-residential By-laws and Enforcement which had an overall ranking of Medium.

Table 5-12: Comparative Evaluation of Multi-residential Services Options

	Organics Management			Waste Collection Methods					Planning, Policies & Enforcement	
Categories, Criteria & Indicators	**Option 2.7** Community/Mid-Scale Composting	**Option 5.1** On-site Organics Processing	**Option 5.2** In-Sink Disposal Units	**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	**Option 9.1** Elimination of Collection Service to Multi-residential Buildings	**Option 1.8** Multi-residential By-laws and Enforcement	**Option 1.9** Updates to Current Multi-Residential Development Standards
Environmental Impact/Benefit										
Local Environmental Impact/Benefit:	High (3)	High (3)	Medium (2)	Medium (2)	Medium (2)	Medium (2)	Medium (2)	Medium (2)	Medium (2)	Medium (2)
Regional/Global Environmental Impact/Benefit:	Medium (2)	Medium (2)	Medium (2)	Medium (2)	Medium (2)	Medium (2)	Low (1)	Low (1)	Medium (2)	Medium (2)
Public Health Impact/Benefit:	High (3)	Medium (2)	Medium (2)	Medium (2)	High (3)	High (3)	Medium (2)	Low (1)	Medium (2)	Medium (2)
Potential to Increase Diversion:	Low (1)	Low (1)	Low (1)	Medium (2)	Medium (2)	Low (1)	Low (1)	Low (1)	Medium (2)	Low (1)
Waste Hierarchy:	Medium (2)	Medium (2)	Medium (2)	Medium (2)	Medium (2)	Medium (2)	Low (1)	Low (1)	Medium (2)	Medium (2)
Ranking Average Score	Medium/ High 2.2	Medium 2.0	Medium 1.8	Medium 2.0	Medium/ High 2.2	Medium 2.0	Medium Low 1.4	Low 1.2	Medium 2.0	Medium 1.8
Social Impact/Benefit										
Approvals Complexity:	High (3)	High (3)	High (3)	High (3)	High (3)	High (3)	High (3)	High (3)	Medium (2)	High (3)
Potential for Land Use Conflicts/Community	Low (1)	Low (1)	Medium (2)	Medium (2)	High (3)	High (3)	Medium (2)	Low (1)	Low (1)	Medium (2)

	Organics Management			Waste Collection Methods					Planning, Policies & Enforcement	
Categories, Criteria & Indicators	**Option 2.7** Community/Mid-Scale Composting	**Option 5.1** On-site Organics Processing	**Option 5.2** In-Sink Disposal Units	**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	**Option 9.1** Elimination of Collection Service to Multi-residential Buildings	**Option 1.8** Multi-residential By-laws and Enforcement	**Option 1.9** Updates to Current Multi-Residential Development Standards
Interruption:										
Collaboration:	High (3)	Medium (2)	Low (1)	Medium (2)	Low (1)	Low (1)	N/A	N/A	Low (1)	High (3)
Complexity:	Medium (2)	Medium (2)	Medium (2)	N/A	Low (1)	Medium (2)	Medium (2)	High (3)	Medium (2)	High (3)
Convenience:	Medium (2)	Medium (2)	Medium (2)	N/A	Low (1)	Medium (2)	N/A	Medium (2)	Medium (2)	High (3)
Community Safety:	Low (1)	Low (1)	Medium (2)	Medium (2)	Medium (2)	High (3)	Medium (2)	Low (1)	Low (1)	N/A
Equity:	High (3)	High (3)	Low (1)	High (3)	Low (1)	Medium (2)	High (3)	Low (1)	High (3)	High (3)
Behaviour Change:	Medium (2)	Medium (2)	Low (1)	Medium (2)	Low (1)	Low (1)	Low (1)	Low (1)	Medium (2)	Medium (2)
Ranking Average Score	Medium/ High 2.2	Medium 2.0	Medium 1.8	Medium/ High 2.4	Medium /Low 1.7	Medium/ High 2.2	Medium 2.0	Medium 1.8	Medium 1.8	High 2.8
Financial Impact/Benefit										
Cost:	Medium (2)	Medium (2)	Low (1)	Medium (2)	Medium (2)	High (3)	Medium (2)	Low (1)	Medium (2)	High (3)
Health Care Cost Implications	High (3)	High (3)	High (3)	High (3)	High (3)	High (3)	High (3)	Medium (2)	High (3)	High (3)

	Organics Management			Waste Collection Methods					Planning, Policies & Enforcement	
Categories, Criteria & Indicators	**Option 2.7** Community/Mid-Scale Composting	**Option 5.1** On-site Organics Processing	**Option 5.2** In-Sink Disposal Units	**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	**Option 9.1** Elimination of Collection Service to Multi-residential Buildings	**Option 1.8** Multi-residential By-laws and Enforcement	**Option 1.9** Updates to Current Multi-Residential Development Standards
Risk:	High (3)	High (3)	Medium (2)	High (3)	High (3)	High (3)	High (3)	High (3)	Medium (2)	Medium (2)
Economic Growth:	Low (1)	Low (1)	Medium (2)	Low (1)	Medium (2)	Medium (2)	Medium (2)	Medium (2)	Medium (2)	Low (1)
Local Job Creation:	Medium (2)	Medium (2)	High (3)	High (3)	High (3)	High (3)	Medium (2)	Medium (2)	High (3)	Medium (2)
Flexibility:	Medium (2)	Low (1)	Low (1)	High (3)	Medium (2)	Low (1)	Medium (2)	Medium (2)	High (3)	High (3)
Ranking	Medium/ High	Medium	Medium	Medium /High	Medium/ High	Medium/ High	Medium/ High	Medium	Medium/ High	Medium/ High
Average Score	2.2	2.0	2.0	2.5	2.5	2.5	2.4	2.0	2.5	2.4
Overall Ranking	Medium/ High	Medium	Medium	Medium/ High	Medium	Medium/ High	Medium	Medium/ Low	Medium	Medium/ High
Total Score	6.6	6.0	5.6	6.9	6.4	6.7	5.8	5.0	6.3	7.0

5.6.4 Discussion of Multi-residential Services Evaluation Results

The comparative evaluation considered the potential impact or benefit each option would have associated with the criteria established for the three categories: Environmental; Social and Financial. The following provides a brief discussion of the results for the three groupings of options within the evaluation categories.

Organics Management

When the Environmental criteria were applied to all the options, Option 2.7: Community/Mid-Scale Composting ranked highest (Medium/High), primarily due to the least impact to local environmental and public health. Option 2.7: Community/Mid-scale Composting ranked higher (Medium/High) than the other options in the Social category, predominantly due to greater opportunities for collaboration. For the Financial Category, Option 2.7: Community/Mid-Scale Composting ranked highest (Medium/High). For these reasons and with the application of priorities, Option 2.7: Community/Mid-Scale Composting will be carried forward for further consideration.

Waste Collection Methods

Option 3.2a: Alternative Collection Methods for Multi-residential Buildings - One Container System ranked the highest of options in the Environmental category, predominantly due to a beneficial impact on Public Health. Option 9.1: Elimination of Collection Service to Multi-residential Buildings ranked the lowest of all options for Environmental Impact/Benefit, primarily due to higher impacts to the Regional/Global Environment, Public Health, and low potential to increase diversion if the City eliminates collection service to multi-residential buildings. Option 3.7: Multi-residential Collection using Alternative Vehicles also received a relatively low score for Environmental Impact/Benefit.

For Social impact, two options, Option 3.1: Container Management, Option 3.2b: Alternative Collection Methods for Multi-residential Buildings - Vacuum System were ranked as Medium/High, with two options (Option 3.7: Multi-residential Collection using Alternative Vehicles and Option 9.1: Elimination of Collection Service to Multi-residential Buildings ranked as Medium. Option 3.2a ranked lowest (Medium/Low), primarily due to being more complex and less convenient than other options.

For Financial impacts, four options ranked as Medium/High; Option 9.1: Elimination of Collection Service to Multi-residential Buildings ranked the lowest due to the loss of revenue from multi-residential service.,

Option 9.1: Elimination of Collection Service to Multi-residential Buildings was not carried forward for further consideration based on its low environmental scores. Generally it was felt that elimination of City service to multi-residential buildings would not be received favourably by residents who expect the City to provide the service and that there is the potential that residents

would receive less diversion opportunities in the future if not receiving City service. Option 3.7: Alternative Vehicles was also not carried forward for further consideration based on its low environmental ranking.

Although the two alternative collection methods ranked fairly high overall, and within each category, they were not carried forward for further consideration. Option 3.2a: Alternative Collection Methods for Multi-residential Buildings - One Container System had a large social impact, predominantly due to the potential complexity of the system and equity issues including ongoing cost of purchasing bags. Option 3.2b: Alternative Collection Methods for Multi-residential Buildings - Vacuum System is better suited for installation in new developments and is not a system the City is considering for full-scale implementation. For these reasons, these two alternative collection methods were not carried forward for further consideration.

Based on the above, and with the application of priorities, Option 3.1: Container Management will be carried forward for further consideration.

Planning, Policies and Enforcement

Options 1.8: Multi-residential By-laws and Enforcement and 1.9: Updates to Current Multi-residential Development Standards both ranked as Medium and scored very closely for Environmental impact/benefit. Option 1.8 scored higher with a greater potential to increase diversion compared to Option 1.9.

When the Social impacts of the options were considered, Option 1.9: Updates to Current Multi-residential Development Standards ranked higher than Option 1.8: Multi-residential By-laws and Enforcement. Option 1.9 had the highest score due to more benefits to the residents living in multi-residential buildings including greater equity, greater convenience and the opportunity for greater collaboration among community groups and organizations.

Both options scored very similarly for Financial Impact/Benefit. Both options will be carried forward for further consideration as both have potential to increase waste diversion.

5.6.5 Recommended Multi-residential Services Options for Further Consideration

Based on the application of the approved evaluation criteria, the following options are recommended for implementation in the future. These options were carried forward for further consideration as they each have potential to drive additional diversion.

- Option 1.8: Multi-Residential By-law and Enforcement
- Option 1.9: Updates to Current Multi-Residential Development Standards
- Option 2.7: Community/Mid-Scale Composting
- Option 3.1: Container Management

5.6.6 Multi-residential Services Implementation Considerations

For each of the recommended options identified above, the following should be considered when developing the best approach to implementation of;

- Option 1.8: Multi-residential By-law and Enforcement
    - The requirement for all multi-residential buildings to provide comprehensive waste diversion services, regardless of whether the buildings receive City or private collection services, may bring more customers back to the City since it may not be more cost effective to move to private sector collection services and provide only garbage collection services to tenants.
    - Existing by-laws must be amended or new by-laws created. Fines may need to be re-addressed.
    - Multi-residential property management/owners must be educated about the requirements of the new by-law.
    - Extensive enforcement by the City is critical to ensure compliance and success. Additional enforcement staff may need to be hired (temporarily or permanently) to address the needs of multi-residential buildings. Also, additional staff might be needed to address the larger number of City customers which might result from levelling the playing field with the private sector.
    - An increase in new City customers may result in the need for more collection vehicles and impact Blue Bin materials and Green Bin organics processing capacity.
    - Wording of the by-law is important to ensure that multi-residential building owners/property managers do not just put Blue and Green Bins in place but also promote the program – source separation requirements of tenants and targets will be important.
- Option 1.9: Updates to Current Multi-residential Development Standards
    - Collaboration will be required with City Planning and Engineering and Construction Services and other City Divisions.
    - Extensive consultation with and education of the development community will be important.
    - Potential resistance from the property development community who may be opposed to new requirements that reduce the potential number or size of future units for a given site footprint.
- Option 2.7: Community/Mid-Scale Composting
    - Requires dedicated staff (not necessarily City Staff) to maintain operations and monitor parameters such as feedstock quality and temperature.

- Decide on City's role in community/mid-scale composting operations and determine thresholds for permitting requirements.
- Dedicate area(s) for community composting operations.
- Funding for initial set up and ongoing maintenance and compost product quality testing.
- Training of staff and volunteers is important to ensure the composting process is being followed and that quality compost is produced.
- Community compost may be low quality as it is rarely tested due to high testing costs. Contamination of feedstock (i.e. plastic forks) degrades the quality of the compost.
- Determine end use of finished compost.

- Option 3.1: Container Management

  - The City has a committed multi-residential front-end collection contract in place until 2026. This provides sufficient time to test new and emerging container management approaches through a series of pilot tests.
  - Will need to monitor utility rates as they may be impacted by decreased waste set outs resulting from optimized container management.
  - Procurement of technology will need to be completed together with corporate information and technology.
  - Staff time required to input collection container, scheduling and routing information into database.
  - Training to waste collection drivers and staff on how to use the system where required.
  - May impact collection contract.

5.7 Industrial, Commercial and Institutional Services

The following sections provide an overview of the evaluation process for the industrial, commercial and institutional (IC&I) services options resulting in the identification of recommended options and implementation considerations.

5.7.1 IC&I Services: Gap, Challenge and/or Opportunity Addressed

The following gap(s), challenge(s) and/or opportunity(ies) were identified early in the project as items to be addressed through the Waste Strategy. The options evaluated have been specifically identified as options that address the following gap(s), challenge(s) and/or opportunity(ies);

- to provide the IC&I sector with options which promote greater diversion and are flexible to accommodate changing waste streams and customer accessibility.
- 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.

5.7.2 Summary of IC&I Services Options Identified

The following Table 5-13 provides a summary of options identified within this group for evaluation.

Table 5-13: Summary of IC&I Services Options Identified

Option	Brief Summary
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	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. 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: Explore 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*. 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 9.5: City of Toronto Exits the IC&I Waste Management Service	This option involves the City (to the extent practical, given the requirement to collect waste from Residential Units Above Commercial (RUAC)) transitioning out of the collection and management of IC&I waste, thereby eliminating influence over IC&I waste diversion unless other policy options are adopted. In addition, the City could decide to more completely exit the IC&I market by not accepting IC&I waste at their own transfer stations or at Green Lane landfill. In the future therefore, the City would have no involvement with IC&I waste management (i.e. the City ceases to provide any collection to businesses on City streets and ceases to

Option	Brief Summary
	accept IC&I waste at transfer stations or at the Green Lane Landfill). All businesses in Toronto that currently receive City collection, and Blue Bin materials and Green Bin organics collection at no additional fees, only Yellow Bag program fees, will need to contract with private sector haulers for collection service.

5.7.3 Evaluation of IC&I Services Options

Table 5-14 presents the comparative evaluation of the IC&I Services options. Both 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 9.4: Explore Mandatory Approaches to IC&I Waste Diversion had an overall ranking of Medium. When considering the application of priorities, Option 9.4: Explore Mandatory Approaches to IC&I Waste Diversion would be the preferred option as it the highest ranking of Medium/High in the Environmental Category, primarily due to the greater potential to increase diversion.

Table 5-14: Comparative Evaluation of IC&I Services

Categories, Criteria & Indicators	**Option 9.3** Expand City of Toronto Share of IC&I Waste Management Market	**Option 9.4** City Implements IC&I Waste Diversion Policies	**Option 9.5** City of Toronto Exits the IC&I Waste Management Service
Environmental Impact/Benefit			
Local Environmental Impact/Benefit:	Medium (2)	Medium (2)	Medium (2)
Regional/Global Environmental Impact/Benefit:	Medium (2)	Medium (2)	Medium (2)
Public Health Impact/Benefit:	Medium (2)	Medium (2)	Low (1)
Potential to Increase Diversion:	Medium (2)	High (3)	Low (1)
Waste Hierarchy:	Medium (2)	Medium (2)	Medium (2)
Ranking Average Score	Medium 2.0	Medium/High 2.2	Medium/Low 1.6
Social Impact/Benefit			
Approvals Complexity:	High (3)	Medium (2)	High (3)
Potential for Land Use Conflicts/Community Interruption:	Medium (2)	Low (1)	Low (1)
Collaboration:	Low (1)	Low (1)	Low (1)
Complexity:	Medium (2)	Low (1)	Low (1)
Convenience:	Medium (2)	Low (1)	Low (1)
Community Safety:	Medium (2)	Low (1)	Low (1)
Equity:	Medium (2)	Low (1)	Low (1)

Categories, Criteria & Indicators	Option 9.3 Expand City of Toronto Share of IC&I Waste Management Market	Option 9.4 City Implements IC&I Waste Diversion Policies	Option 9.5 City of Toronto Exits the IC&I Waste Management Service
Behaviour Change:	Medium (2)	Medium (2)	Low (1)
Ranking	Medium	Low	Low
Average Score	2.0	1.3	1.3
Financial Impact/Benefit			
Cost:	Low (1)	Medium (2)	High (3)
Health Care Cost Implications:	High (3)	High (3)	Medium (2)
Risk:	High (3)	Medium (2)	High (3)
Economic Growth:	Medium (2)	Medium (2)	Low (1)
Local Job Creation:	High (3)	High (3)	Medium (2)
Flexibility:	Medium (2)	High (3)	High (3)
Ranking	Medium/ High	Medium/ High	Medium/ High
Average Score	2.4	2.5	2.4
Overall Ranking	**Medium**	**Medium**	**Medium/Low**
Total Score	**6.4**	**6.0**	**5.3**

5.7.4 Discussion of IC&I Services Evaluation Results

The comparative evaluation considered the potential impact or benefit each option would have associated with the criteria established for the three categories: Environmental; Social and Financial. The following provides a brief discussion of the results for the three options within the evaluation categories.

- Within the Environmental Category, Option 9.4: Explore Mandatory Approaches to IC&I Waste Diversion ranked the highest, primarily for the potential to increase diversion. Option 9.5: City of Toronto Exits the IC&I Waste Management Service ranked the lowest due to the potential impacts to Public Health and less potential to divert waste.

- Within the Social Category, 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 ranked the highest (Medium). Options 9.4: Explore Mandatory Approaches to IC&I Waste Diversion and 9.5: City of Toronto Exits the IC&I Waste Management Service both ranked Low, primarily for potential for increased traffic, less convenience and greater complexity to the user.

- In the Financial Category, all options were ranked the same as Medium/High with very close scores. Option 9.4: Explore Mandatory Approaches to IC&I Waste Diversion scored slightly higher with an overall edge due to local job creation and economic growth. Option 9.3: Expand IC&I Services scored lower on cost due to the potential for increased cost associated with greater provision of service.

5.7.5 Recommended IC&I Services Options for Further Consideration

Based on the application of the approved evaluation criteria, the following options are recommended for implementation in the future:

- 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
- Option 9.4: Explore Mandatory Approaches to IC&I Waste Diversion

Option 9.5: City of Toronto Exits the IC&I Waste Management Service was not carried forward for further consideration due to the potential environmental and social impacts.

5.7.6 IC&I Services Implementation Considerations

For each of the recommended options identified above, the following should be considered when developing the best approach to implementation of:

- Option 9.3: Expand City of Toronto Share of IC&I Waste Management Market
    - Competition with private sector - City would be cutting into private sector hauler business, which potentially could result in strong resistance from waste management industry. There is also potential for small hauling business to lose hauling contracts.
    - Processing and disposal capacity requirements potentially increase.
    - Consultation process to determine level of acceptance of this approach and rationale for the City getting more involved in the IC&I market.
    - Market assessment to determine IC&I customers that could be added to the City service.
    - Gradual process whereby IC&I generators involved can move collection services from their current service provider to the City.
    - More City trucks with implications for staffing, operating costs, management etc.

- Option 9.4: Explore Mandatory Approaches to IC&I Waste Diversion
    - Businesses may see this as one more item that they do not have resources or time to address, and potentially as unnecessary City interference.

- Haulers would not necessarily be supportive of policies that mandate service levels for diversion as a requirement to haul garbage.
- Potential new licensing requirements for haulers.
- Joint Provincial-Municipal enforcement efforts for existing Provincial regulatory requirements.
- Carry out an assessment of the potential impact of the IC&I policies and other instruments on integrated waste management system.
- Explore permissible legal mechanisms, if any, to increase IC&I diversion.
- Public consultation to identify attitudes and likely impacts of different policies on different stakeholders

5.8 Construction, Renovation and Demolition Services

The following sections provide an overview of the evaluation process for the construction, renovation and demolition (CRD) services options resulting in the identification of recommended option(s) and implementation considerations.

5.8.1 CRD Services: Gap, Challenge and/or Opportunity Addressed

The following gap(s), challenge(s) and/or opportunity(ies) were identified early in the project as items to be addressed through the Waste Strategy. The options evaluated have been specifically identified as options that address the following gap(s), challenge(s) and/or opportunity(ies);

- 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.
- how to better promote and facilitate diversion of CRD materials generated by the CRD sector, which comprises a significant amount of the total waste stream generated in the city. To date, there has been no pressure placed on the CRD sector by the City to encourage diversion and ensure a level playing field for CRD companies. Private sector initiatives to construct and operate CRD recycling facilities in the GTA have failed, due to lack of business, as disposal remains the cheaper and preferred option.

5.8.2 Summary of CRD Services Options Identified

The following Table 5-15 provides a summary of options identified within this group for evaluation.

Table 5-15: Summary of CRD Services Options Identified

Option	Brief Summary
Option 10.1: 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[12] such as clean wood,

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

Option	Brief Summary
	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. 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. 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. 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: 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

Option	Brief Summary
	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, 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.

5.8.3 Evaluation of CRD Services Options

Table 5-16 presents the comparative evaluation of the CRD options. Both Option 10.1: Depots, Processing, and Policies to Divert CRD Waste and Option 10.2: CRD Disposal Ban had the same overall ranking of Medium/High, with Option 10.2 scoring slightly higher overall. When considering the application of priorities, both options ranked Medium/High in the Environmental Category and Social Category. Option 10.2 ranked higher in the Financial Category as Option 10.1: Depots, Processing, and Policies to Divert CRD Waste involved the cost of establishing depots and a CRD processing facility.

Table 5-16: Comparative Evaluation of CRD Services

Categories, Criteria & Indicators	Option 10.1	Option 10.2

	Depots, Processing, and Policies to Divert Construction, Renovation and Demolition (CRD) Waste	Construction, Renovation, Demolition (CRD) Disposal Ban
Environmental Impact/Benefit		
Local Environmental Impact/Benefit:	High (3)	Medium (2)
Regional/Global Environmental Impact/Benefit:	Medium (2)	Medium (2)
Public Health Impact/Benefit:	Medium (2)	Medium (2)
Potential to Increase Diversion:	High (3)	High (3)
Waste Hierarchy:	Medium (2)	Medium (2)
Ranking	Medium/High	Medium/High
Average Score	2.4	2.2
Social Impact/Benefit		
Approvals Complexity:	Medium (2)	Medium (2)
Potential for Land Use Conflicts/Community Interruption:	Medium (2)	Low (1)
Collaboration:	High (3)	High (3)
Complexity:	Medium (2)	Medium (2)
Convenience:	Low (1)	Low (1)
Community Safety:	Medium (2)	High (3)
Equity:	High (3)	High (3)
Behaviour Change:	High (3)	High (3)
Ranking	Medium/High	Medium/High
Average Score	2.3	2.3
Financial Impact/Benefit		
Cost:	Low (1)	Medium (2)
Health Care Cost Implications	High (3)	High (3)
Risk:	Medium (2)	High (3)
Economic Growth:	Medium (2)	Medium (2)
Local Job Creation:	Medium (2)	Medium (2)
Flexibility:	Medium (2)	High (3)
Ranking	Medium	Medium/High
Average Score	2.0	2.5
Overall Ranking	Medium/High	Medium/High
Total Score	6.7	7.0

5.8.4 Discussion of CRD Services Evaluation Results

The comparative evaluation considered the potential impact or benefit each option would have associated with the criteria established for the three categories: Environmental; Social and Financial. The following provides a brief discussion of the results for the options within the evaluation categories.

When the Environmental criteria were applied to the two options, both ranked as Medium/High. Option 10.1: Depots, Processing, and Policies to Divert CRD Waste scored slightly better on Local Environmental Impact/Benefit as Option 10.2: CRD Disposal Ban has greater potential for illegal dumping.

When the Social Impacts of the options were considered, Option 10.1: Depots, Processing, and Policies ranked and scored the same as Option 10.2: CRD Disposal Ban. Both have the same potential for collaboration, creating equity, and encouraging behavioural changes. Both options were rated Low in terms of convenience.

For Financial impacts, Option 10.2: CRD Disposal Ban had the highest score. While this option had a low potential for economic growth, it has relatively low risk potential, and relatively high potential for local job creation, as well as being flexible to implement. Option 10.1: Depots, Processing, and Policies to Divert CRD Waste ranked lower on costs due to the higher costs of implementing this option with the potential construction or acquisition of a processing facility.

5.8.5 Recommended CRD Services Options for Further Consideration

Based on the application of the approved evaluation criteria, both identified options are recommended for implementation in the future.

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

Although based on the application of priorities, Option 10.1: Depots, Processing, and Policies to Divert CRD Waste would be the preferred option, both options will be carried forward for further consideration as there is a logical progression in moving forward with Option 10.2: CRD Disposal Ban after the implementation of 10.1: Depots, Processing, and Policies to Divert CRD Waste, depending on the status of Provincial regulations at the time. 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 Waste Strategy which accompanies the proposed *Waste-Free Ontario 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.

5.8.6 CRD Services Implementation Considerations

For each of the recommended options identified above, the following should be considered when developing the best approach to implementation of;

- Option 10.1: Depots, Processing, and Policies to Divert CRD Waste
    - Under the proposed *Waste-Free Ontario Act*, the Province may impose mandatory requirements to promote waste diversion in the CRD industry. This will have consequences for the management of CRD waste by generators, who may be interested in source separating and dropping off waste loads at City drop-offs.
    - Under the proposed *Waste-Free Ontario Act*, the Province may require municipalities to implement policies targeting materials including CRD wastes. The details will not be known until draft regulations are released for comment, which is not expected until after 2017.
    - There will be a need to ensure that CRD diversion depots are provided at the transfer stations or at large stand-alone depots (should any be constructed) to provide easy diversion options, especially for small contractors (e.g. renovation industry and do-it-yourself home renovators).
    - There will be a need to determine the availability and stability of markets for processed CRD materials so that processing requirements can be identified to meet end market specifications and increase the value of the collected CRD materials.
    - A business case would need to be developed to determine what support mechanisms would be needed to make the CRD processing facility a successful endeavour.
    - There will be a need to consider the potential for increased illegal dumping because of higher tipping fees. Enforcement is necessary to keep illegal dumping activity to a minimum.
    - Outreach will be necessary to identify potential public and/or private partnerships.
    - Education and outreach to the CRD industry will be required to notify them of new supporting policies and processing opportunities as well as accepted materials, etc.
    - The City of Toronto should work with other GTA municipalities to develop collaborative and consistent approaches to CRD waste management policies in order to ensure a level playing field is established among impacted CRD companies throughout the GTA.
    - Additional staff will be required to manage CRD waste at depots.

- Option 10.2: CRD Disposal Ban
    - Under the proposed *Waste-Free Ontario Act*, the Province may impose provincial disposal bans on CRD materials over time. The Province may require municipalities to implement policies targeting CRD wastes. The details will not be known until draft regulations are released for comment, which are not expected until after 2017.

- A phased-in schedule should be developed in consultation with the CRD industry.
- There will be a need to determine the availability and stability of markets and processing capacity within the GTA for targeted banned materials.
- A comprehensive promotion, education and outreach campaign will need to be developed to ensure that CRD companies understand the requirements of the new material bans.
- Amendments may be required to existing by-laws to accommodate the requirements of the CRD disposal bans.
- Technical assistance support would be valuable for small/medium sized companies.

5.9 Incentive Based Options

The following sections provide an overview of the evaluation process for the incentive based options resulting in the identification of a recommended option and implementation considerations.

5.9.1 Incentive Based Options: Gap, Challenge and/or Opportunity Addressed

The following gap(s), challenge(s) and/or opportunity(ies) were identified early in the project as items to be addressed through the Waste Strategy. The options evaluated have been specifically identified as options that address the following gap(s), challenge(s) and/or opportunity(ies);

- to provide its customers with convenient options which promote greater diversion and are flexible to accommodate changing waste streams and resident accessibility.
- the impact 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.

5.9.2 Summary of Incentive Based Options Identified

The following Table 5-17 provides a summary of options identified within this group for evaluation.

Table 5-17: Summary of Incentive Based Options Identified

Option	Brief Summary
Option 9.8: Deposit-return System for City of Toronto for Selected Materials	Toronto could consider establishing a deposit return system - within the limits of the City of Toronto - for targeted materials that would subsequently be removed from the waste stream. Targeted materials might include: non-alcoholic beverage containers (i.e. soft drinks, water bottles and potentially juices and milk) and/or household batteries.
Option 3.6: Incentive Based Drop-off System (e.g. Reverse Vending	Participation in a drop-off/donation centre is rewarded either through returning cash or coupons from the

Option	Brief Summary
Machines (RVMs))	company/retailer/association/product manufacturer sponsoring the reverse vending equipment. 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.

5.9.3 Evaluation of Incentive Based Options

Table 5-18 presents the comparative evaluation of the Incentive Based options. Option 3.6: Incentive Based Drop-off System (e.g. RVMs) ranked higher overall than Option 9.8: Deposit-return System for City of Toronto for Selected Materials and will be carried forward for further consideration.

Table 5-18: Comparative Evaluation of Incentive Based Options

Categories, Criteria & Indicators	**Option 3.6** Incentive-based drop-off systems – Reverse Vending Machines	**Option 9.8** Deposit-return System for City of Toronto for Selected Materials
Environmental Impact/Benefit		
Local Environmental Impact/Benefit:	High (3)	High (3)
Regional/Global Environmental Impact/Benefit:	Medium (2)	Medium (2)
Public Health Impact/Benefit:	Medium (2)	Medium (2)
Potential to Increase Diversion:	Low (1)	Low (1)
Waste Hierarchy:	Medium (2)	Medium (2)
Ranking Average Score	Medium 2.0	Medium 2.0
Social Impact/Benefit		
Approvals Complexity:	High (3)	Medium (2)
Potential for Land Use Conflicts/Community Interruption:	Medium (2)	Low (1)
Collaboration:	High (3)	Medium (2)
Complexity:	High (3)	Medium (2)
Convenience:	Medium (2)	Low (1)
Community Safety:	Medium (2)	Medium (2)
Equity:	High (3)	Medium (2)
Behaviour Change:	Low (1)	Low (1)

Categories, Criteria & Indicators	Option 3.6 Incentive-based drop-off systems – Reverse Vending Machines	Option 9.8 Deposit-return System for City of Toronto for Selected Materials
Ranking	Medium/High	Medium/Low
Average Score	2.4	1.7
Financial Impact/Benefit		
Cost:	Medium (2)	Low (1)
Health Care Cost Implications:	High (3)	High (3)
Risk:	High (3)	High (3)
Economic Growth:	Low (1)	Medium (2)
Local Job Creation:	High (3)	High (3)
Flexibility:	Medium (2)	Medium (2)
Ranking	Medium/High	Medium/High
Average Score	2.4	2.4
Overall Ranking	Medium/High	Medium
Total Score	6.8	6.1

5.9.4 Discussion of Incentive Based Options Evaluation Results

The comparative evaluation considered the potential impact or benefit each option would have associated with the criteria established for the three categories: Environmental; Social and Financial. The following provides a brief discussion of the results for the two options within the evaluation categories.

With respect to the Environmental Category, the two options had identical scores. Both would be considered strong in terms of local impact, and would give the City the ability to locally retain benefits of implementation. Neither option will have a huge impact on diversion.

For Social Benefits/Impacts, Option 3.6: Incentive Based Drop-off System (e.g. RVMs) has a considerably higher score than Option 9.8: Deposit-return System for City of Toronto for Selected Materials. RVMs would be relatively simple for the City to help site and approve, and would provide opportunities for collaboration with other community organizations. As the RVMs could be located throughout the City, there would be a minimal impact on any specific group and underserved areas could easily see new machines added.

Comparably, a Toronto-only deposit system would be difficult to enforce and manage. New depots could have a significant impact on traffic, as they would need to be located in convenient, sometimes high traffic locations with adequate space to manage potentially large volumes (e.g.

in the case of non-alcoholic beverage containers) of deposit bearing materials. Further, some access via public transit would be required to meet the needs of a large portion of the population. It would be nearly impossible to prevent items purchased outside City boundaries from being redeemed for deposits. This same problem would apply to both non-alcoholic beverage containers and for household batteries (i.e. enforcing city boundaries).

Both options had the same score with respect to Financial criteria. While local jobs would be created (especially under a deposit-refund system for non-alcoholic beverage containers), a significant capital outlay would be required to implement either RVMs or new depots for items with a deposit.

5.9.5 Recommended Incentive Based Options for Further Consideration

Based on the application of the approved evaluation criteria, only Option 3.6 is recommended for implementation in the future.

- Option 3.6: Incentive Based Drop-off System (e.g. RVMs)

Option 3.6: Incentive Based Drop-off System (e.g. RVMs) is recommended for further consideration. This option, for targeted materials (such as cell phones, fluorescent bulbs, small and high value electronics), presents a novel approach using both proven technologies (i.e. reverse vending machines) and consumer incentives (e.g. cash rewards or coupons for participating) that could be a viable, supplementary approach to help meet material targets. It is recommended however that this approach be considered under specific conditions: that targeted materials are not achieving diversion targets through existing efforts; that the overall risk, planning and financing of a network of RVMs in the city be the primary responsibility of producers of the targeted materials; and that the city may choose to play only a supportive role (e.g. in terms of public education support and/or offering public space areas as potential locations for RVM installations) in the initiative.

Option 9.8: Deposit-return System for City of Toronto for Selected Materials was not recommended for further consideration. A Toronto-based deposit return system for either non-alcoholic beverage containers or for household batteries is not being recommended for two primary reasons (i.e. in addition to the low evaluation scores). The first reason is the challenge of enforcing only the return of materials for which deposits were paid by consumers within the City's boundary –i.e. the return of non-deposit paid materials to locations within the City would likely overwhelm the system. Secondly, stand-alone systems such as these tend to be less convenient for consumers (i.e. as compared to placing materials in the Blue Bin or – in the case of batteries – returning materials to drop off depots where a range of other materials are also accepted). It should be noted however, that the City – in collaboration with other Ontario municipalities – should encourage the province to keep open the option of province wide deposit-return systems in the future (i.e. under the anticipated 100% producer responsibility

legislation being considered) as an alternate means to reach targets for under-performing products and materials.

5.9.6 Incentive Based Options Implementation Considerations

For each of the recommended options identified, the following should be considered when developing the best approach to implementation of;

- Option 3.6: Incentive Based Drop-off System (e.g. RVMs)
  - Investigate RVMs and other incentive opportunities materials such as cell phones, MP3 players, fluorescent lamps, batteries, etc.
  - Carry out pilot program to measure diversion performance for one year.
  - Potential partnerships and agreements with take back agencies and other organizations responsible for the materials that might be captured.
  - Develop partnerships with retailers willing to finance small incentives or coupons.
  - Identify sources of funding to finance the incentive approach.
  - Support the development of a business case to justify the RVM approach and compare to other approaches which would achieve same diversion at lower costs (e.g. payment of a "bounty" to consumers for returning high-value / environmentally sensitive recoverable materials).
  - Support the development of a business plan to include locations, number of RVMs, costs of incentives, likely diversion achieved, etc.

5.10 Controls, Bans and Enforcement

The following sections provide an overview of the evaluation process for the controls, bans and enforcement option resulting in the identification of a recommended option and implementation considerations.

5.10.1 Controls, Bans and Enforcement: Gap, Challenge and/or Opportunity Addressed

The following gap(s), challenge(s) and/or opportunity(ies) were identified early in the project as items to be addressed through the Waste Strategy. The option evaluated have been specifically identified as option that address the following gap(s), challenge(s) and/or opportunity(ies);

- 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 housing units 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 voluntary compliance is not at the desired level, requiring strategic consideration of mandatory measures.

5.10.2 Summary of Controls, Bans and Enforcement Option Identified

The following Table 5-19 provides a summary of the option identified within this group for evaluation. It should be noted that this option is a broad based option incorporating many mechanisms to achieve greater control of the waste stream and encourage waste reduction and waste diversion; however, these mechanisms have been rolled up into one option.

Table 5-19: Summary of Controls, Bans and Enforcement Option Identified

Option	Brief Summary
Option 9.7: 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. 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. 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.

5.10.3 Evaluation of Controls, Bans and Enforcement Options

Given that there was only one option in this category, a comparative evaluation was not carried out. Rather the option was evaluated as a stand-alone option using evaluation. Table 5-20 presents the ranking of this option.

Table 5-20: Evaluation of Controls, Bans and Enforcement Options

Categories, Criteria & Indicators	Option 9.7 City Explores Control Mechanisms
Environmental Impact/Benefit	
Local Environmental Impact/Benefit:	Medium (2)
Regional/Global Environmental Impact/Benefit:	Medium (2)
Public Health Impact/Benefit:	Medium (2)
Potential to Increase Diversion:	High (3)
Waste Hierarchy:	Medium (2)
Ranking **Average Score**	Medium/High 2.2
Social Impact/Benefit	
Approvals Complexity:	Medium (2)
Potential for Land Use Conflicts/Community Interruption:	Medium (2)
Collaboration:	Medium (2)
Complexity:	Medium (2)
Convenience:	Medium (2)
Community Safety:	High (3)
Equity:	Low (1)
Behaviour Change:	Medium (2)
Ranking **Average Score**	Medium 2.0
Financial Impact/Benefit	
Cost:	High (3)
Health Care Cost Implications:	High (3)
Risk:	Medium (2)
Economic Growth:	Medium (2)
Local Job Creation:	Medium (2)
Flexibility:	High (3)
Ranking **Average Score**	Medium/High 2.5
Ranking **Average Score**	Medium/High 6.7

5.10.4 Discussion of Controls, Bans and Enforcement Evaluation Results

The comparative evaluation considered the potential impact or benefit each option would have associated with the criteria established for the three categories: Environmental; Social and Financial. The following provides a brief discussion of the results for this option within the evaluation categories.

In terms of Environmental Impacts, Option 9.7: City Explores Mechanisms to Introduce City-wide Controls Over Waste Management ranked Medium/High. This was largely due to the high potential for increased diversion and placement on the waste hierarchy. The option ranked Medium for Social Impacts and Benefits. While there was a high impact on community safety, the option scored low on equity, as different players involved in waste management (either as generators or service providers) will be impacted differently by various policies and approaches. In terms of Financial Impacts and Benefits, this option ranked Medium/High as impacts to cost, health care costs and flexibility were favourable.

5.10.5 Recommended Controls, Bans and Enforcement Options for Further Consideration

Based on the application of the approved evaluation criteria, the identified option below is recommended for implementation in the future.

- Option 9.7: City Explores Mechanisms to Introduce City-wide Controls over Waste Management is recommended for implementation as it provides significant benefits to waste diversion and better control over the waste stream.

5.10.6 Controls, Bans and Enforcement Implementation Considerations

For the recommended option identified above, the following should be considered when developing the best approach to implementation of;

- Option 9.7: City Explores Mechanisms to Introduce City-wide Controls over Waste Management
    - Research appropriate instruments (disposal bans, by-laws, regulations etc.) to accomplish the specific objectives.
    - Public consultation program to identify attitudes and likely impacts of different policies on different stakeholders.
    - Comprehensive suite of coordinated/integrated policies and regulations to address all aspects of the waste management system and reduce waste disposed.
    - Removing materials from the waste stream to “highest and best use” is consistent with circular economy framework[13].

[13] A **circular economy** is an alternative to a traditional linear **economy**(make, use, dispose) in which we keep resources in use for as long as possible, extract the maximum value from them whilst in use, then recover and regenerate products and materials at the end of each service life (www.wrap.org.uk)

- Additional City of Toronto resources required, depending on the options chosen.
- Consider impact of proposed *Waste Free Ontario Act.*

6 Summary of Recommended Options

The following Table 6-1 provides a summary of the options being recommended for implementation in the future:

Table 6-1: Summary of Recommended Options

System Component	Recommended Options
Reduction & Reuse	• Food Waste Reduction Strategy • Textile Collection and Reuse Strategy • Sharing Library • Support Reuse Events • Explore Opportunities for Waste Exchange
Collection & Drop-off Depot	• Develop a Network of Permanent, Small Scale Neighbourhood Drop-off Depots in Convenient Locations. • Develop a Mobile Drop-off Service
Commissioners Transfer Station	• Relocation of Commissioners Street Transfer Station within the Port Lands Area or Designation of Land for Long-Term Relocation
Materials & Energy Recovery	• Mixed Waste Processing with Organics Recovery Facility Development
Residual Waste Disposal	Near Term Recommendations • Adjust Tipping Fees or Customer Base • Securing Disposal Capacity to Preserve Long-Term Landfill Capacity at GLL Long Term Recommendations 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	• Multi-residential By-law and Enforcement • Updates to Current Multi-residential Development Standards • Community/Mid-Scale Composting • 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 • Explore Mandatory Approaches to IC&I Waste Diversion
Overall System Recommendations – Construction, Renovation & Demolition	• Depots, Processing, and Policies to Divert CRD Waste • CRD Material Disposal Ban
Overall System Recommendations –	• Incentive Based Drop-off System (e.g. Reverse Vending Machines)

System Component	Recommended Options
Incentive Based Options	
Controls, Bans and Enforcement	• City Explores Mechanisms to Introduce City-wide Controls over Waste Management

7 Next Steps

Now that the more detailed evaluation of each option and group of options is complete, the phasing and implementation of each recommended option can be completed. The recommended options and proposed “Roadmap” for implementation will be documented in the Draft Long Term Waste Management Strategy document.