

Essex Windsor Solid Waste Authority

2011 Solid Waste Management Master Plan

Review and Update

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Executive Summary

Introduction

The Essex-Windsor Solid Waste Authority (EWSWA) is a joint board of management of the Corporation of the County of Essex and the Corporation of the City of Windsor. The EWSWA is responsible for administering the Essex-Windsor Solid Waste Management Master Plan (SWMMP) and for the operations of the facilities established under that Master Plan. Essex-Windsor initiated its long term solid waste management planning process in 1985 and adopted its Solid Waste Management Master Plan in October, 1993 in support of the Environmental Assessment Act and Environmental Protection Act applications for the Essex-Windsor Regional Landfill Site. The Master Plan contained the following waste management goals for Essex-Windsor:

- To encourage reduction and reuse wherever possible;
- To recycle everything that can be recycled;
- To compost what is compostable; and
- To landfill the rest.

The Master Plan also set waste diversion objectives that increased over time:

- 50% waste diversion by the year 2000;
- 55% by 2010; and
- 60% by 2019¹.

In July 2011, the EWSWA commenced a review of its SWMMP, which the EWSWA is required to do every five years, as part of its government approval for the Essex-Windsor Regional Landfill Site.

The purpose of this review was to identify a broad suite of waste management options and assess their impact on Essex-Windsor's residential waste diversion rate.

Essex-Windsor is not alone in its efforts to maximize waste diversion and minimize the amount of waste sent for disposal, as many municipalities across Ontario (and other jurisdictions across Canada and the United States) are also striving for greater waste diversion. Reasons for Essex-Windsor to pursue increased waste diversion include:

- Waste diversion targets have been set in the 1993 Master Plan, which was formed in support of its application and approval for the Regional Landfill;
- The Province of Ontario has a 60% residential waste diversion target for the province;
- Waste diversion is a key component of sustainable and environmentally responsible waste management, and the public demands municipalities manage waste in a responsible manner; and
- Many other municipal landfills in Ontario are facing capacity issues, and ensuring long-term municipal disposal capacity is good governance.

¹ The current provincial residential waste diversion rate target is also 60%.

The Solid Waste Management Master Plan

1993 Master Plan Review and Update

The Councils of the County of Essex and City of Windsor adopted the Essex-Windsor SWMMP in October 1993. The Master Plan was approved following an extensive development and public consultation process that began in 1984 and was carried out by the EWSWA's predecessor, the Essex-Windsor Waste Management Committee. The SWMMP had the following waste management goals for Essex- Windsor:

- To encourage reduction and reuse wherever possible;
- To recycle everything that can be recycled;
- To compost what is compostable; and
- To landfill the rest.

The 1993 SWMMP also contained a section stating that the Master Plan must be reviewed at least every five years, or more frequently if required, to consider the potential effect on SWMMP programs and facilities due to:

- Major changes in population and residential, commercial or industrial development;
- Differences in the source, type, quantity or composition of solid waste requiring management;
- Emergence of new technologies;
- Experience with waste management programs or facilities in other jurisdictions;
- Unexpected closure or significant problems associated with components of the waste management system; and
- Private sector initiatives that could potentially affect the management of waste.

Since 1993, the SWMMP has been reviewed in 1998, 2003, and now this review that was initiated in 2011.

1998 Master Plan Review and Update

As a result of the 1998 Master Plan review, the EWSWA approved two revisions that qualified the original goals of the SWMMP:

- Increased recycling and composting efforts should be undertaken in the future only if they are feasible; and
- The Master Plan diversion objectives should be met as long as the programs and facilities are economically, socially, environmentally and technically sound.

Also, the 1998 Master Plan Review proposed three scenarios for potential implementation. Scenario 1 as described below was adopted by the Board:

Scenario 1 – Moderate Diversion

- All existing waste diversion activities will be maintained.
- The current publicity and education program will be expanded and enhanced.
- Recycling services will be expanded for multi-unit buildings to serve all remaining units.

- Recycling services will be provided not only in municipal offices, but also in all other municipal properties (e.g. parks) and for all municipally sponsored events.
- Recycling will be encouraged/mandated for community events and recreational venues.
- Recycling services for small businesses will be reviewed and modified and /or expanded as required to increase diversion in this sector.
- Staff efforts in support of IC&I diversion will be increased.

2003 Master Plan Review and Update

In 2003, the Master Plan was reviewed again, resulting in ten recommended updates. The Board approved the following six recommendations:

- Recommendation #1: All existing waste diversion programs currently operated in Essex-Windsor should be maintained.
- Recommendation #2: The EWSWA should calculate residential waste generation and diversion based on curbside collected quantities according to the Standard Municipal Waste Diversion Rate (SMWDR) calculation methodology which does not include industrial, commercial and institutional (IC&I) waste quantities.
- Recommendation #4: The EWSWA should investigate the opportunity to implement an incentive-based program to reward those residents who participate in waste diversion programs and encourage others to begin participating.
- Recommendation #5: The EWSWA should continue with their current public education and promotional initiatives and expand as new programs are implemented. A special focus should be on materials currently collected with low recovery rates including cardboard, boxboard and HDPE (High Density Polyethylene – e.g. ketchup, juice and milk narrow neck plastic containers)
- Recommendation #6: The EWSWA should ban all waste materials designated under the Environmental Protection Act Ontario Regulation 103/94 and generated by a subject facility from being disposed at a municipal disposal facility. O. Reg. 103/94 relates to materials originating from industrial, commercial and institutional facilities. Examples of materials include those traditionally found in a residential blue box as well as items such as drywall, bricks, concrete, wood and steel.
- Recommendation #8: A Request for Expressions of Interest (REOI) should be developed and issued to all known organic waste generators in Essex-Windsor to solicit their interest in participating in a large scale, centralized composting facility for the organic waste materials generated by the subject industry.

Since the 2003 Master Plan Review, a number of initiatives have been implemented to help increase waste diversion in Essex-Windsor, including:

- Construction of a new recycling centre in 2007/2008, which resulted in paper materials being processed in the old plant while processing container type materials in the new plant. This has accommodated the addition of new materials that residents can recycle.
- Addition of new materials to the blue box program (including gable top containers, Tetra-pak containers, other aluminum packaging and foil, empty aerosol cans, empty pain cans, and tubs and lids labelled #2, #4 and #5).
- Implementation of programs to increase the amount of recyclables from multi-residential units, such as apartments.

- Addition of an electronics recycling program.
- Enhancement of the recycling program in municipal offices and other facilities.
- Increased recycling in parks and public spaces.
- Planning for a depot at the Regional Landfill for the receipt of recyclables, household chemical waste, metal, tires, electronics and yard waste organics. The depot was actually constructed in 2012.
- Expansion of the yard waste organics pad at the Windsor Depot to better handle and manage the receipt of material from residents and small industrial, commercial and institutional customers. The pad was doubled in size in 2011. The original pad was constructed during 2007/2008.
- Initiation of a study and review of public education and advertising to measure their effectiveness in relation to waste diversion. The study was conducted during 2011 and 2012.

2011 Master Plan Review and Update

Essex-Windsor's Current Waste Management System

In 2010, Essex-Windsor residents generated 153,819 tonnes of waste and diverted approximately 38.5% (or 59,229 tonnes) through its various waste management programs (waste figures for industrial, commercial and institutional sectors are not included). This is less than Essex-Windsor's waste diversion targets as set out in the 1993 SWMMP.

Essex-Windsor's waste diversion rate is also below the average waste diversion rate of 45% for the other municipalities examined as part of this review. However, it is important to note that:

- The EWSWA's per tonne blue box program and disposal costs are low compared to other municipalities; and
- Most of those municipalities with greater diversion rates use a mix of the following waste management approaches currently not implemented in Essex-Windsor:
 - Curbside collection of food and kitchen organics;
 - Bag limits, with either full or partial user pay;
 - Every other week collection of garbage;
 - Expanded blue box collection (where materials such as mixed plastics, plastic film, and other materials are accepted in the blue box); and
 - Weekly Collection of recyclables.

Recommendations Stemming from the 2011 Master Plan Review & Update

The review of the EWSWA's SWMMP included a close look at the waste management programs available in Essex-Windsor, the types of residential waste being diverted and disposed by households, and opportunities for increasing the amount of waste being diverted from disposal. Based on the review of available options and feedback from the public, the following recommendations have been suggested as updates to the EWSWA's SWMMP, which should help Essex-Windsor achieve its 60% waste diversion target.

GARBAGE COLLECTION

1. **Garbage Bag Set Out Limits** - It is recommended that the EWSWA propose that Essex-Windsor's individual municipalities adopt a garbage bag limit of three bags or containers, to be reduced to a limit of two bags as new waste diversion programs are implemented, for the following reasons:
 - Bag limits are considered a waste management best practice;
 - Bag limits have been shown to encourage participation in waste diversion programs and increase waste diversion;
 - Bag limits are commonly used in municipalities across Ontario and North America;
 - Based on the survey of set out rates conducted in 2011, the majority of households should be able to conform to a three bag limit (and a subsequent 2 bag limit at a later date).

HOUSEHOLD ORGANICS

2. **Food and Kitchen Organics Collection and Processing** - It is recommended that the EWSWA conduct a study to assess the feasibility of collecting and processing food and kitchen waste organics from households in Essex-Windsor. The study should include (but may not be limited to):
 - More detailed analysis of collection costs, including required equipment (e.g., carts and mini-bins, split body collection trucks, etc.);
 - The cost-effectiveness of implementing the program County-wide or just in urban or suburban areas;
 - The cost-effectiveness to construct a processing facility in Essex-Windsor to process the material (and potentially material from other municipalities) versus exporting the material to a private or other municipal facility;
 - The type of processing facility to construct, if it is determined that processing should be undertaken by the EWSWA;
 - Opportunities to cost-share with other municipalities (e.g., a regional composting facility);
 - Opportunities for cost-savings in garbage and recyclables collection (e.g., every other week garbage collection, co-collection of garbage or recyclables, etc); and
 - An implementation strategy (which should include pilot testing communication material, household collection, etc.).

This recommendation has been put forward because:

- Food and kitchen waste provides Essex-Windsor with its greatest opportunity for increasing waste diversion;
- Without diversion of food and kitchen waste, Essex-Windsor is unlikely to achieve the targets outlined in the 1993 Master Plan or the provincial target of 60% waste diversion;
- Experience with municipal collection methods and composting technologies in Ontario and other parts of Canada has increased in the past five years (e.g., new facilities in Hamilton,

Guelph, Peel, Toronto, Ottawa, etc), and municipal composting programs are becoming more commonplace; and

- Essex-Windsor may have the flexibility to either build its own facility (and potentially earn revenue by processing organics from other neighbouring municipalities) or export food and kitchen organics to another facility.

3. **Backyard Composting** - It is recommended that the EWSWA continue with its practice of making subsidized backyard composters available to residents. The EWSWA should assess making a limited amount of backyard composters available for free, possibly tied in with a waste diversion education activity or as an incentive for participation in waste diversion programs. This program is recommended because it:

- Provides Essex-Windsor with a cost effective program to increase its waste diversion rate;
- Increases the amount of waste managed at the household, thereby reducing the amount of waste requiring collection and disposal;
- Encourages other activities (e.g., gardening) that are beneficial for individuals and society;
- Reduces the amount of organics entering the landfill, thereby reducing environmental management risks associated with landfilling organic material; and
- Is an option that is appreciated by the public, particularly those with an interest in backyard composting and waste diversion.

RECYCLING

4. **Larger Blue Bins (22 US Gallon / 83 Litre)** - It is recommended that the EWSWA proceed with planning the purchase of larger blue bins (For Containers) for distribution to Essex-Windsor households, as:

- The larger bins will allow households to place more materials in their blue bin, thereby reducing the amount of blue bin overflow that is placed into the garbage;
- Households will need containers larger than the 60 litre (16 US Gallon) blue boxes currently distributed, if mixed plastics or other materials are introduced into the blue box program;
- It is expected that households will appreciate receiving a larger blue box with no out-of-pocket expense from them; and
- Funding for larger blue boxes is available from the Continuous Improvement Fund (CIF), which will increase the cost-effectiveness of the option. The CIF is an agency created by Waste Diversion Ontario to assist municipalities in improving diversion.

5. **Weekly Collection of Recyclables** - It is recommended that the EWSWA continue with its practice of instructing bidders to provide pricing for weekly and bi-weekly collection of recyclables in its collection tender², as:

- It will allow the EWSWA to assess the cost-effectiveness of providing weekly recyclables collection; and
- While weekly collection is more expensive, it has been demonstrated to provide increased diversion.

² Next recycling collection tender occurs in 2016

6. **Mixed Plastics** - It is recommended that the EWSWA introduce mixed plastics (e.g. baker and produce clamshell containers) into the blue box recycling program because:
 - It will help keep this material from being landfilled;
 - It will increase the EWSWA's waste diversion rate;
 - While there will be a cost for an additional sorter at the Material Recycling Facility, there is an opportunity for revenues to offset some or all of the additional cost and generate revenue;
 - It will increase the level of service provided to residents, who have asked for the ability to recycle more materials; and
 - It may make sorting of plastics easier for residents.

7. **Polystyrene** - It is recommended that the EWSWA pilot test accepting polystyrene (Styrofoam) at its recycling depots and promote the opportunity, as it will:
 - Help keep this material from being landfilled;
 - Raise service levels for residents by providing them with an opportunity to recycle this material;
 - Potentially increase the efficiency and effectiveness of the EWSWA's blue box program by keeping polystyrene out of the blue box stream;
 - Help measure the cost-effectiveness of recycling polystyrene in Essex-Windsor and whether a densifier is warranted; and
 - Help to confirm the amount of polystyrene waste available for recycling.

8. **Plastic Film** - It is recommended that the EWSWA pilot test accepting plastic film (e.g., plastic grocery bags) at its recycling depots, engage local retailers to establish a local plastic bag take-back bin at their outlets, and promote these opportunities to residents. This recommendation is being put forward because it will:
 - Help keep this material from being landfilled;
 - Help raise Essex-Windsor's waste diversion rate;
 - Help measure the cost-effectiveness of accepting plastic film at the EWSWA's recycling depots;
 - Increase the level of service to residents by providing them with an opportunity to recycle this material; and
 - Potentially increase the efficiency and effectiveness of the EWSWA's blue box program by keeping plastic film out of the blue box stream.

9. **Satellite Depots** - It is recommended that the EWSWA assess the feasibility of establishing waste diversion depots in strategic locations across the County as a means to provide greater convenience and increased participation. The assessment should include (but not be limited to):
 - Preferred strategic locations, from both an operations perspective and a customer service perspective;
 - The types of materials that would be accepted at the depots;
 - Whether the depots would be staffed;

- Estimated increase in waste diversion; and
- Anticipated costs.

This recommendation is being put forward because:

- It would provide another opportunity where residents can take their overflow blue box materials and other divertible materials that may not otherwise be collected curbside (depending on what is accepted at the depots); and
- It is a potentially cost-effective way to raise the level of service provided to the residents of Essex-Windsor.

10. **Reuse Centre Partnerships** - It is recommended that EWSWA explore potential partnerships with charitable organizations to construct, operate or otherwise facilitate a reuse centre.

This recommendation is being put forth because:

- It could help keep material from going to the landfill;
- There is the potential for added diversion from this option;
- Reuse centres help to fulfill a community need for low-price household goods;
- Such a partnership would likely be more cost effective than having EWSWA establish a reuse centre on its own and would help support local charity; and
- EWSWA would be able to build upon the reuse activities by promoting other opportunities for waste reuse (e.g., thrift stores, existing reuse organizations, reuse online networks such as freecycle and Craigslist).

11. **Mandatory Recycling** - It is recommended that the EWSWA propose that the Essex-Windsor municipalities and the EWSWA collectively discuss the feasibility of introducing mandatory recycling in Essex-Windsor. This discussion should include (but not be limited to):

- Whether mandatory recycling is introduced in a new or existing municipal by-law;
- The purpose of mandatory recycling in Essex-Windsor and how it would be used (e.g., as an educational tool, degree of enforcement, etc);
- What constitutes "recycling" (e.g., a certain number of blue box set-outs during a period of time, blue box materials prohibited from being placed in the garbage, etc);
- The level of enforcement (e.g., passive or active enforcement, use of fines or refusal of garbage collection service, etc);
- Examples of how mandatory recycling has been implemented in other municipalities, including wording used in other by-laws or policies; and
- The need for it to be consistent across all Essex-Windsor municipalities.

This recommendation is put forth because:

- Mandatory recycling provides additional credence to educational activities;
- It provides municipalities with a legislative backdrop against which other programs can be implemented;

- It provides municipalities with the means to address excessive waste disposal behaviours or absent waste diversion practices; and
- Municipalities have the flexibility to enforce a mandatory by-law as much or as little as they want, depending on what is required and the intent of the by-law.

OUTREACH

12. **Promotion and Education** - It is recommended that the EWSWA continue with its qualitative and quantitative research on barriers to recycling and other waste diversion programs in order to better understand how residents recycle, their barriers and motivation for participating in the waste diversion activities, and how to overcome the barriers.

It is also recommended that the EWSWA develop a Community-based Social Marketing campaign to address the barriers identified in the market research. Based on the barrier research, incentives may form part of the Community-based Social Marketing campaign.

These recommendations are put forward because:

- Promotion and education is a best practice;
 - It is one of the most cost-effective ways of increasing participation in waste diversion programs and increasing the amount of waste diverted;
 - Increased promotion and education is an option well supported by residents; and
 - Without sustained promotion and education, waste diversion programs will not work optimally (i.e., participation will drop off, or residents will participate incorrectly, which increases processing costs).
13. **Extended Producer Responsibility (EPR)** - It is recommended that the EWSWA and local municipalities alike continue with efforts to lobby for increased Extended Producer Responsibility (EPR) because:
- It can be incorporated as part of staff or politicians regular duties with no additional capital expense; and
 - It can ultimately result in reduced cost to the municipality for waste diversion programs as product stewards increase funding for programs or assume responsibility for specific waste materials (e.g., tires, electronics, alcohol containers, etc).

SUMMARY AND COST

A summary of the recommended Master Plan updates is provided in Table ES1 on the following page. The recommended updates will help the EWSWA manage Essex-Windsor's waste into the future and, if implemented in full, achieve the provincial and Master Plan waste diversion targets. The estimated annual operating cost to implement the entire suite of updates is approximately \$4.8M (net). However, this cost assumes that a food and kitchen organic waste program would be implemented County-wide. If the program is implemented in only urban and suburban areas, then the annual operating cost (and the amount of food and kitchen organics diverted) would be less. Similarly, the estimated capital cost of these recommended Master Plan updates is approximately \$2.8M (excluding the cost of a food and kitchen waste composting facility), when alternative funding sources such as the CIF are factored in. As the largest part of the cost is attributed to curbside

collection of food and kitchen organics, the capital costs would be lower if the service is limited to urban and suburban areas of Essex-Windsor.

It is important to note that the increases in diversion rates and tonnage listed in Table ES1 are not necessarily cumulative, as some initiatives will overlap and support aspects of other programs.

Table ES1: Estimated Cost and Diversion of Recommendations

Recommendation	Estimated Operating and Capital Cost	Estimated Diversion Increase (%)	Estimated Diversion Increase (tonnes)
1. Garbage Set Out Limits	Minimal increase in operating cost (promotion, education and enforcement)	2% to 6%	3,000 – 9,000 tonnes
2. Food and Kitchen Organics Collection and Processing	Capital: Program implementation (including purchase of carts, not including facility costs): \$2.5 M Annual operating: 4.6 M (assumes County-wide; offset by potential garbage collection and disposal savings)	Up to 15%	23,000 tonnes
3. Backyard Composting	Operating: \$5,000 - \$10,000 for promotion and education	1% to 3%	1,500 to 4,600 tonnes
4. Larger Blue Bins	\$850,000 in capital costs, distribution and promotion, with \$540,000 potentially recovered with CIF funding	2% to 4%	3,100 to 6,200 tonnes
5. Weekly Collection of Recyclables	to be determined through tender process	2% to 3%	3,100 to 4,600 tonnes
6. Mixed Plastics	Operating: \$44,000 (potentially offset partially or in full by revenues from sale of recyclables)	1%	1,400 tonnes
7. Polystyrene	\$163,000 - \$229,000	less than 1%	320 tonnes
8. Plastic Film	Minimal if collected at retail	2.5%	3,800 tonnes
9. Satellite Depots	Capital: \$5,000 to \$10,000 per depot	1% - 2%	1,500 – 3,100 tonnes
10. Reuse centre Partnerships	To be determined by nature of partnership	1%	1,500 tonnes
11. Mandatory Recycling	to be determined with level of enforcement required	2%	3,100 tonnes
12. Promotion and Education	Operating: \$10,000	1% to 4%	1,500 to 6,200 tonnes
13. Extended Producer Responsibility (EPR)	Staff time	1% to 3%	1,500 to 4,600 tonnes

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1 Introduction

The Essex-Windsor Solid Waste Authority (EWSWA) is a joint board of management of the Corporation of the County of Essex and the Corporation of the City of Windsor. The EWSWA is responsible for administering the Essex-Windsor Solid Waste Management Master Plan (SWMMP) and for the operations of the facilities established under that Master Plan. Essex-Windsor initiated its long term solid waste management planning process in 1985 and adopted its Solid Waste Management Master Plan in October, 1993 in support of the Environmental Assessment Act and Environmental Protection Act applications for the Essex-Windsor Regional Landfill Site. The Master Plan contained the following waste management goals for Essex-Windsor:

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- The Province of Ontario has a 60% residential waste diversion target for the province;
- Waste diversion is a key component of sustainable and environmentally responsible waste management, and the public demands municipalities manage waste in a responsible manner; and
- Many other municipal landfills in Ontario are facing capacity issues, and ensuring the long-term disposal capacity of a municipality is good governance.

This report is divided into 8 main sections, including this introduction:

- Section 2 provides an overview of previous Master Plan reviews completed by the EWSWA;

³ The current provincial residential waste diversion rate target is also 60%.

- Section 3 reviews the waste management programs currently administered by the EWSWA and its municipal partners;
- Section 4 analyzes Essex-Windsor's current residential solid waste composition and opportunities for diversion;
- Section 5 projects Essex-Windsor's population growth;
- Section 6 reviews a broad suite of waste diversion options for increasing Essex-Windsor's waste diversion rate, including estimated cost, contribution to increased waste diversion, and a recommendation on whether the option should be carried forward in the updated SWMMP;
- Section 7 presents the results of the stakeholder/public consultation; and
- Section 8 summarizes the recommended SWMMP updates.

2 Review of Previous Master Plans

2.1 1993 Master Plan Review and Update

The Councils of the County of Essex and City of Windsor adopted the Essex-Windsor SWMMP in October 1993. The Master Plan was approved following an extensive development and public consultation process that began in 1984 and was carried out by the EWSWA's predecessor, the Essex-Windsor Waste Management Committee. The SWMMP had the following waste management goals for Essex- Windsor:

- To encourage reduction and reuse wherever possible;
- To recycle everything that can be recycled;
- To compost what is compostable; and
- To landfill the rest.

In July of 1997, Essex-Windsor Regional Landfill was opened. The 1995 Environmental Assessment Act approval for the landfill contained two conditions related to the SWMMP:

- Essex-Windsor shall make every reasonable effort to implement the policies of the Essex-Windsor Waste Management Master Plan as adopted in October 1993 by the Corporation of the County of Essex and the City of Windsor, and any subsequent revisions to the Master Plan (Clause 6.1); and
- Essex-Windsor shall formally review the Solid Waste Management Master Plan and its policies at least every five years from the date of its adoption. The Master Plan review should, at the minimum, be reviewed with respect to waste generation and diversion records, and changes in technology. The Master Plan review shall be undertaken in consultation with the public in accordance with MOE guidelines (Clause 6.2).

Additionally, the 1993 SWMMP also contained a section stating that the Master Plan must be reviewed at least every five years, or more frequently if required, to consider the potential effect on SWMMP programs and facilities due to:

- Major changes in population and residential, commercial or industrial development;
- Differences in the source, type, quantity or composition of solid waste requiring management;.
- Emergence of new technology;

- Experience with waste management programs or facilities in other jurisdictions;
- Unexpected closure or significant problems associated with components of the waste management system; and
- Private sector initiatives that could potentially affect the management of waste.

Since 1993, the SWMMP has been reviewed in 1998, 2003, and now this review that was initiated in 2011.

2.2 1998 Master Plan Review and Update

As a result of the 1998 Master Plan review, the EWSWA approved two revisions that qualified the original goals of the SWMMP:

- Increased recycling and composting efforts should be undertaken in the future **only if they are feasible**; and
- The Master Plan diversion objectives should be met as long as the programs and facilities are **economically, socially, environmentally and technically sound**.

Also, the 1998 Master Plan Review proposed three scenarios for potential implementation. Scenario 1 as described below was adopted by the Board, while no action was taken to implement Scenarios 2 or 3:

Scenario 1 – Moderate Diversion (approved by the Board)

- All existing waste diversion activities will be maintained
- The current publicity and education program will be expanded and enhanced.
- Recycling services will be expanded for multi-unit buildings to serve all remaining units.
- Recycling services will be provided not only in municipal offices, but also in all other municipal properties (e.g. parks) and for all municipally sponsored events.
- Recycling will be encouraged/mandated for community events and recreational venues
- Recycling services for small businesses will be reviewed and modified and /or expanded as required to increase diversion in this sector.
- Staff efforts in support of IC&I diversion will be increased.

Scenario 2 – Aggressive Diversion (no action taken by Board on this scenario)

- All components included in Scenario 1 will also be included in Scenario 2.
- User Pay systems will be tested in some municipalities, and then considered for general adoption – assuming initial results warranted expansion
- Mandatory By-Laws will be adopted – requiring residents and possibly IC&I generators as well, to participate in recycling programs. This action could be matched with appropriate material bans at landfill
- Consideration will also be given to mandatory backyard composting (where appropriate), and matching bans at landfill, for selected materials (e.g. grass clippings, yard waste).

Scenario 3 – Most Aggressive Diversion (no action taken by Board on this scenario)

- All components of Scenario 1 (but not Scenario 2) will also be included in Scenario 3.
- Three stream collection systems (garbage, recyclables, kitchen and yard waste) will be implemented in all municipalities.
- These collection systems will also be expanded to include additional target materials.
- Centralized composting will be fully implemented, with one or more sites (e.g. one site for the City, another for the County) established to receive separated organic stream from all municipalities.

2.3 2003 Master Plan Review and Update

The 2003 Master Plan Review and Update made ten recommendations. The following six recommendations were approved by the Board, while the Board took no action on four of the ten recommendations.

Approved Recommendations

Recommendation #1: All existing waste diversion programs currently operated in Essex-Windsor should be maintained.

Recommendation #2: The EWSWA should calculate residential waste generation and diversion based on curbside collected quantities according to the Standard Municipal Waste Diversion Rate (SMWDR) calculation methodology which does not include industrial, commercial and institutional (IC&I) waste quantities.

Recommendation #4: The EWSWA should investigate the opportunity to implement an incentive-based program to reward those residents who participate in waste diversion programs and encourage others to begin participating.

Recommendation #5: The EWSWA should continue with their current public education and promotional initiatives and expand as new programs are implemented. A special focus should be on materials currently collected with low recovery rates including cardboard, boxboard and HDPE (High Density Polyethylene – e.g. ketchup, juice and milk narrow neck plastic containers)

Recommendation #6: The EWSWA should ban all waste materials designated under the Environmental Protection Act Ontario Regulation 103/94 and generated by a subject facility from being disposed at a municipal disposal facility. O. Reg. 103/94 relates to materials originating from industrial, commercial and institutional facilities. Examples of materials include those traditionally found in a residential blue box as well as items such as drywall, bricks, concrete, wood and steel.

Recommendation #8: A Request for Expressions of Interest (REOI) should be developed and issued to all known organic waste generators in Essex-Windsor to solicit their interest in participating in a large scale, centralized composting facility for the organic waste materials generated by the subject industry.

Recommendations On Which No Action Was Taken

Recommendation #3: The EWSWA should implement a standard, region-wide, garbage bag setout limit of 3 bags per single family residential household supported by the following:

- Additional bags setout beyond the limit should require the purchasing of a “bag tag” at a cost to the waste generator.
- A “Junk” collection day should be provided to all residential properties in Essex-Windsor at a minimum seasonally.
- A minimum fee should be charged at all Public Drop-Off Depots for waste to be disposed.

Bag limits should be phased in as collection contracts are tendered.

Recommendation #7: A consistent Leaf and Yard Waste (including Grass, Leaves, Hedge Trimmings, etc.) collection service should be provided to all residential properties in the municipalities of Essex-Windsor.

Recommendation #9: The EWSWA should initiate the siting of a new centralized composting facility (considering the results of the REOI) capable of managing existing and future quantities of organic waste materials.

Recommendation #10: A strategic plan for the phased rollout of curbside source separated organics collection program should be developed identifying the preferred method of setout, collection, and processing components to be utilized.

2.4 Recent Enhancements to Essex-Windsor’s Waste Management System

Since the 2003 Master Plan Review, a number of initiatives have been implemented to help increase waste diversion in Essex-Windsor, including:

- Construction of a new recycling centre in 2007/2008, which resulted in paper materials being processed in the old plant while processing container type materials in the new plant. This has accommodated the addition of new materials that residents can recycle.
- Addition of new materials to the blue box program (including gable top containers, Tetra-pak containers, other aluminum packaging and foil, empty aerosol cans, empty pain cans, and tubs and lids labelled #2, #4 and #5).
- Implementation of programs to increase the amount of recyclables from multi-residential units, such as apartments.
- Addition of an electronics recycling program.
- Enhancement of the recycling program in municipal offices and other facilities.
- Increased recycling in parks and public spaces.
- Planning for a depot at the Regional Landfill for the receipt of recyclables, household chemical waste, metal, tires, electronics and yard waste organics. The depot was actually constructed in 2012.

- Expansion of the yard waste organics pad at the Windsor Depot to better handle and manage the receipt of material from residents and small industrial, commercial and institutional customers. The pad was doubled in size in 2011.
- Initiation of a study and review of public education and advertising to measure their effectiveness in relation to waste diversion. The study was conducted during 2011 and 2012.

3 Overview of Current Waste Collection and Diversion Programs in Essex-Windsor

The EWSWA was created in 1994 to provide waste management programs and facilities within the geographical boundary of Essex County and the City of Windsor (Essex-Windsor). This geographical area includes the County of Essex (comprised of the Town of Amherstburg, the Town of Essex, the Town of Kingsville, the Town of Lakeshore, the Town of LaSalle, the Municipality of Leamington and the Town of Tecumseh) and the City of Windsor. The EWSWA is responsible for administering the Essex Windsor Solid Waste Management Master Plan and its Board is comprised of nine County and City Council Members.

The EWSWA is considered a `Urban Regional` jurisdiction, based on Waste Diversion Ontario's (WDO) municipal grouping. In 2010, Essex-Windsor had an estimated population of 393,115⁴, and waste collection services and diversion programs were provided to 158,270 households by the EWSWA. The households are comprised of 131,603 single family homes and 26,667 multi-residential family units⁵. The EWSWA provides the following services and facilities using private contractors and municipal services:

- Bi-weekly two stream (containers and fibres/paper) curbside recycling collection;
- Recycling bin collection for multi residential units and industrial, commercial and institutional (IC&I) establishments;
- Yard waste depot collection;
- Scrap metal depot collection;
- Scrap tire depot collection;
- Reuse centre that includes collection of Municipal Hazardous and Special Waste (MHSW);
- White goods curbside and depot collection for County residents (City residents take materials to depot);
- Waste Electrical and Electronic Equipment (WEEE) depot collection;
- Essex-Windsor Regional Landfill;
- One yard waste composting site at the Regional Landfill;
- Two transfer stations and drop-off depots; and
- Educational programs and promotion.

⁴ Statistics Canada, 2010.

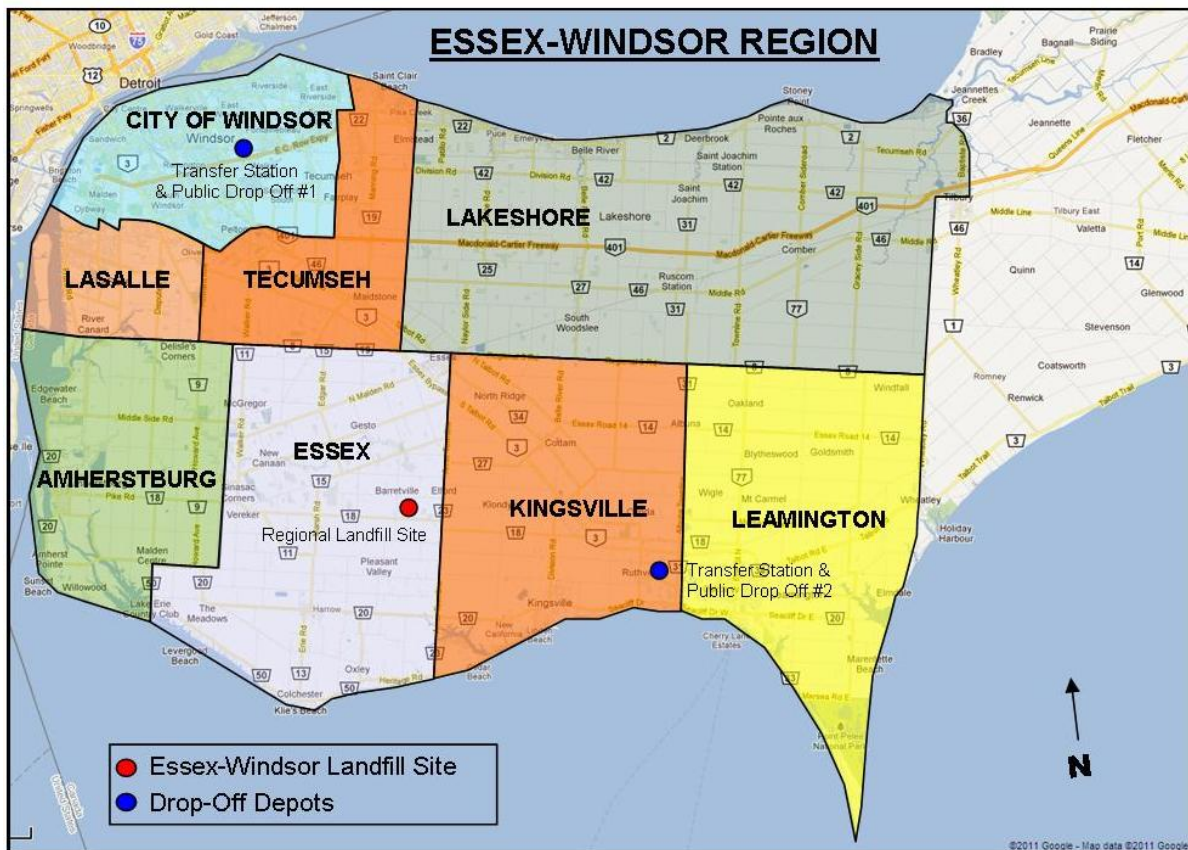
⁵ 2010 Essex Windsor WDO Datacall.

Services such as weekly garbage collection, large item collection and yard waste curbside collection are provided by the local municipalities.

In addition to these programs and facilities, the EWSWA encourages residents and IC&I establishments to further increase diversion through backyard composting, grasscycling, deposit-return programs, public space diversion receptacles and through a comprehensive promotion and educational program.

Figure 1 illustrates the jurisdiction of the EWSWA and shows the locations of key waste management facilities.

Figure 1: Jurisdiction of Essex-Windsor Solid Waste Management Authority



3.1 Transfer Stations and Public Drop-Off Depots

The EWSWA maintains and operates two transfer stations and drop-off depots. In 2011, from December through March the City of Windsor public drop-off depot was open Monday to Friday 8:30 a.m. to 3:45 p.m., and Saturday 9:00 a.m. to 12:45 p.m. From April through May the depot was open Monday to Friday 8:00 a.m. to 6:45 p.m., and Saturday 8:00 a.m. to 4:45 p.m. From June through November the depot was open Monday to Friday 8:00 a.m. to 4:45 p.m., and Saturday 8:00 a.m. to 4:45 p.m. It is located at 3560 North Service Road East, in the City of Windsor.

The Transfer Station No.2 drop-off depot in Kingsville was open 8:30 a.m. to 4:15 p.m. Monday to Friday, Saturday from 9:00 a.m. to 12:00 noon from November 1 to March 31, and then from 8:00 a.m. to 4:45 p.m. Monday to Friday, Saturdays 8:00 a.m. to 1:45 p.m. from April 1 to October 31. It is located at 2021 County Road 31 in the Town of Kingsville.

Acceptable items at the transfer station and drop-off depots include:

- Yard waste;
- Garbage;
- White goods and appliances;
- Scrap metal;
- Municipal Hazardous and Special Waste (MHSW);
- Tires
- Recyclables; and
- Waste Electrical and Electronic Equipment (WEEE).

3.2 Recycling Program

Residents receive curbside collection of recyclable materials in two streams. Container products and plastics are collected in the “blue box” stream and recyclable paper products are collected in the “red box” stream. Both streams are collected on the same day every two weeks.

Container products collected in the blue box stream include :

- Polycoat containers (juice boxes, broth containers);
- Gable top containers (orange juice carton);
- Aluminum cans, foil and packaging;
- Steel cans;
- Other bottles and containers (#3, #5, #7);
- Clear glass;
- Coloured glass.
- Empty aerosol cans;
- Empty paint cans;
- PET Polyethylene terephthalate (#1) bottles (2 litre pop bottle);
- HDPE High Density Polyethylene (#2) containers (Laundry detergent bottle);
- Tubs and lids (#2, #4, #5) (Margarine containers);

The EWSWA currently does not include the following blue box material in their container stream, due to insufficient marketplace demand:

- HDPE / LDPE (Low Density Polyethylene) film (#2, #4 plastics) (plastic wrapping material);
- Polystyrene foam (#6) (Styrofoam);
- Polystyrene crystal (#6) (cd cases), and
- Mixed plastics (e.g., clamshells and other plastic food containers).

Recyclable paper products are collected separately in the “red box” include the following materials:

- Newsprint;
- Other printed paper (OPP);
- Magazines and catalogues ;
- Phone books
- Corrugated cardboard;
- Boxboard; and
- Other mixed paper.

The EWSWA provides recycling bin collection services to all multi-residential and IC&I buildings in the City of Windsor, provided they supply their own containers. In the County municipalities, the EWSWA provides containers and collection for multi-residential units at no cost.

Collection of residential recyclables in the County is currently contracted out to Windsor Disposal Services (WDS) and collection in the City of Windsor is contracted out to Turtle Island Recycling Corporation. All recyclable materials are processed at the two Material Recovery Facilities (MRFs), located at 3560 North Service Road East in Windsor.

3.3 Yard Waste

Yard waste materials such as grass, leaves, tree trimmings and brush are not accepted at the Essex-Windsor Regional Landfill Site for disposal as refuse. Instead, the local municipalities provide seasonal curbside yard waste collection. In addition to curbside collection, residents are allowed to drop off (free of charge) unlimited amounts of yard waste, tree trimmings and leaves at the City of Windsor public drop off depot and at transfer station No.2 in Kingsville. Grass clippings are subject to tipping fees. Christmas tree curbside collection is also provided by the local municipalities as part of yard waste collection following the Christmas holidays.

Yard waste materials are defined differently in each town and municipality. Below is a summary for each municipality.

Table 1: Yard Waste Collection

	Windsor	Amherstburg	Kingsville/Essex/Lakeshore/ LaSalle/Leamington/Tecumseh
Curbside Collection	Leaves, flowers, plants, vegetables and fruit, branch and tree/hedge trimmings, grass clippings, infected ash trees (logs and branches), Christmas trees	Leaves, Christmas trees	Grass, leaves, garden trimmings, fruit and vegetables, rinds, peelings, cores, husks, tea bags, hair, saw dust, dryer lint, Christmas trees
Drop off Depot	Same as curbside	Grass clippings, garden waste, brush and tree trimmings	Same as curbside, except grass
Acceptable Containers	Paper yard waste bags, cardboard boxes, garbage cans, Herby Curby ⁶	Paper yard waste bags, cardboard boxes and garbage cans	Paper yard waste bags, cardboard boxes and garbage cans

⁶ A rugged, wheeled waste cart compatible with Essex-Windsor collection truck lifting equipment.

There is no limit on the amount of yard waste each resident can set out for collection (except in Leamington, where a 4 bag/container limit is in place), but each container must weigh less than 20kg (45lbs).

The EWSWA operates one composting site located at the Regional Landfill where the yard waste material is processed into compost for resale and reuse. Yard waste is ground up and then windrow composted. Once matured, the compost is screened and sold to residents and businesses for use in landscaping and flower and vegetable gardens.

3.4 White Goods

Items such as fridges, stoves, air conditioners, washers, dryers, freezers and dishwashers are considered white goods by the EWSWA and have been banned from disposal at the Regional Landfill. The EWSWA provides residents in the County with curbside white goods collection and the ability to divert these items at their local drop-off depot free of charge, provided there are no hazardous materials left in the item. A surcharge of \$15 is added if the item contains hazardous materials, such as Freon and chlorofluorocarbons (CFCs).

The City of Windsor does not provide residents with curbside white goods collection. Residents are encouraged to use the EnWin⁷ Refrigerator Round-up Program or to drop the items off at the City of Windsor public drop off depot (both services are free of charge, aside from the aforementioned \$15 fee).

3.5 Tires

The diversion of scrap tires occurs through the Windsor public drop-off depot and Transfer Station No.2 in Kingsville. Residents are allowed to drop off eight tires per year at these locations free of charge for recycling. Additional tires are charged according to set tipping fees. The current tire program is managed through Ontario Tire Stewardship.

3.6 Waste Electrical and Electronic Equipment (WEEE) and Municipal Hazardous and Special Waste (MHSW)

The EWSWA operates two MHSW and WEEE collection centres: one at the City of Windsor public drop-off depot and the other at Transfer Station No.2 in Kingsville. Residents are allowed to drop off the following materials free of charge:

- *Household Chemical Waste:* Automotive care products (e.g., tire cleaners, wax), gasoline, solvents, paints, kerosene, varnish, pesticides, antifreeze, stains, propane tanks, drain cleaners, car batteries, used motor oil, acids, mercury thermometers and smoke detectors.
- *WEEE:* Computers, monitors, printers, scanners, telecommunication equipment, electronic relays, telephones, electronic pagers, fax machines, photocopiers, electronic cash registers, radio and stereo equipment, VCR's, DVD players, cameras, military hardware (e.g., navigation equipment, etc) and televisions.

⁷ EnWin Utilities is Windsor's electricity Local Distribution Company.

3.7 Scrap Metal

Ferrous and non-ferrous scrap metal is collected at the City of Windsor public drop-off depot and at the Kingsville transfer station depot in 40-yard roll off bins. Residents are allowed to drop off unlimited amounts of scrap metal free of charge. The EWSWA sells the collected scrap metal material through a competitive bid process to local scrap metal dealers.

3.8 Reuse Center

Located at the City of Windsor public drop off depot, the reuse centre is stocked with reusable items received through the MHSW collection centre. The following items are available to residents free of charge on a first come, first serve basis:

- Latex interior and exterior paints;
- Oil based paints;
- Stains and varnish;
- Automotive care products;
- Pastes;
- Grouts and other repair products;
- Household cleaners;
- Windshield washer fluid; and
- Unused motor oil.

Residents are encouraged to call in advance to determine availability and quantity. Based on supply and demand, paint is available in large quantities for a small fee (enough to cover the cost of the pail and lid).

3.9 Deposit-Return Program

The Ontario Deposit-Return Program is a provincial program run in partnership with the Beer Store that helps to divert eligible wine, beer and spirit containers from disposal in landfills. The program uses deposits on purchased alcohol containers and gives refunds, once returned to any designated return location, to encourage participation and increased diversion. Table 2 below summarizes the program's deposit-refund scheme.

Table 2: Summary of the Ontario Deposit-Return Program.

Eligible Containers*	Deposit/Return Amount
• Containers less than or equal to 630mL	10¢
• Aluminum and steel containers less than or equal to 1L	10¢
• Containers over 630mL	20¢
• Aluminum and steel containers over 1L	20¢
Exempt Containers	No deposit collected or refund offered for these items
• Containers with a volume of 100mL or less (e.g., 50mL minis)	
• Containers purchased at duty-free stores, U-Vint and U-Brew	

* glass bottles, plastic bottles (PET), Tetra Pak containers, bag-in-box, aluminum and steel containers.

3.10 Garbage

The local municipalities provide residents with weekly curbside collection of garbage. Multi-residential units are provided with bin collection. There are currently no limits on the amount of garbage residents can set out for collection, except in Kingsville (5 containers), Leamington (4 containers), and Lasalle (6 containers). All collected garbage is disposed at the Regional Landfill, located at 7700 County Road 18. Several materials are restricted from the landfill and have to be managed through other options. They include the following:

- Radioactive waste;
- Biomedical waste;
- Unidentified chemical waste;
- Industrial chemical waste;
- Ammunition;
- Recyclables;
- Stumps;
- Pallets;
- Tires;
- Creosote contaminated materials; and
- Yard waste.

Apart from the curbside and bin collection services, the EWSWA provides three locations for garbage drop off for residents and IC&I:

- The Regional Landfill, located at 7700 County Road 18, and restricted to vehicles with a tare weight of at least 3000kg
- The Windsor public drop off depot, located at 3560 North Service Road East
- Transfer Station No. 2, located at 2021 County Road 31 in the municipality of Kingsville.

3.11 Regional Landfill

As noted above, the Regional Landfill is located at 7700 County Road 18 in Essex County. It provides the disposal services for Essex-Windsor. According to the *Essex-Windsor Solid Waste Authority Business Review* (prepared by Stantec Consulting, September 2011), the Regional Landfill opened in July 1997 and has an approved capacity of 12.2 million cubic metres. Based on waste compaction densities of 0.7 to 0.8 tonnes per cubic metre, this equates to a total landfill capacity of 8.5 to 9.7 million tonnes. The report estimates that the remaining lifespan of the landfill is 28.5 to 34.5 years⁸ from January 1, 2011, whereby the landfill could close between 2039 and 2045.

3.12 Educational Programs and Promotion

The EWSWA has a comprehensive outreach program that promotes waste reduction, reuse and diversion through educational initiatives and promotional material. For example, school and community presentations are conducted throughout the year, with an emphasis on recycling. A waste reduction hotline (1-800-563-3377) is available for residents with questions and concerns regarding waste management in the region. A dedicated waste management website is maintained and operated by the EWSWA (www.ewswa.org) where residents have access to instructions, reports, collection calendars, list of acceptable and restricted items and a newsletter called "Enviro-Tips".

⁸ Assumes average annual tonnage of 200,000 tonnes.

4 Current Waste Composition

In 2010, Essex-Windsor residents generated 153,819⁹ tonnes of waste and diverted approximately 38.5% (or 59,229 tonnes) through its various waste management programs (waste figures for industrial, commercial and institutional sectors are not included). To better understand where Essex-Windsor's waste is going and how much more can be diverted, an estimate of its waste composition was prepared.

A waste composition provides a snapshot in time of what is inside a waste stream, including garbage, recyclables, household organics such as food waste and yard waste, municipal hazardous and special waste materials, etc. To generate this waste composition, the following sources of information were used:

- 2010 WDO datacall and the EWSWA's 2010 Annual Waste Diversion Report – Each year, the EWSWA submits detailed information to the WDO on the amount of wastes that are disposed of and diverted in Essex-Windsor¹⁰. This information is also discussed in the EWSWA's annual report waste diversion report.
- 2011 EWSWA waste audit – In 2011, the EWSWA conducted an audit of waste collected at curbside. Samples were collected from households over two consecutive weeks and then sorted. The data from this study was used to estimate the composition of materials set out in the garbage and blue boxes in 2010.

The results of the waste composition have been used to estimate the amount of waste material being disposed that could be otherwise be diverted. There are limitations of the data and assumptions that were made in generating the waste composition, including:

- The waste audit for the EWSWA took place during a single season (spring of 2011). As a result, the audit would not have captured seasonal changes or those materials disposed of infrequently.
- Some materials such as tires and white goods are currently diverted by the EWSWA but were not identified in the waste audit. These are items that are commonly stockpiled by residents until they are either dropped off at a depot or collected via a special curbside collection, and they would not necessarily appear in a stand-alone waste audit. Information on these types of materials have been incorporated into the waste composition using the WDO datacall data. As a result, the waste diversion analysis appears to indicate that items such as tires, white goods, deposit-return materials and scrap metal are almost entirely diverted. For the purpose of this analysis, it is assumed that the EWSWA is diverting the majority of these wastes through their or provincial diversion programs.

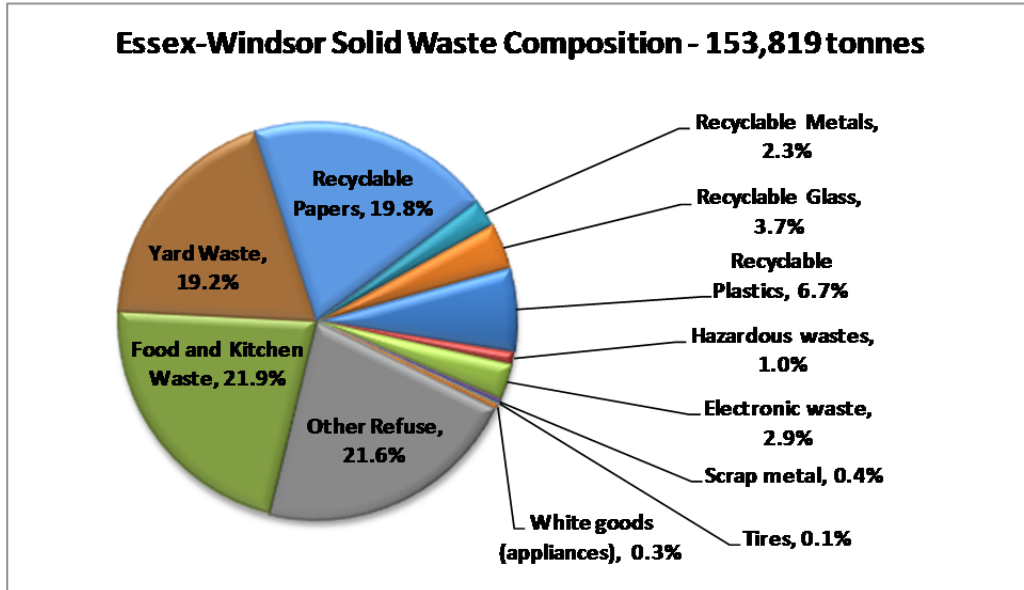
As Figure 2 illustrates, Essex-Windsor's waste composition consists mainly of organic materials (41%¹¹), other refuse (22%), recyclable paper (20%), and other recyclable types of material (17%).

⁹ The 2010 Annual Waste Diversion Report for the EWSWA presents the total waste generated in Essex-Windsor to be 151,653 tonnes. In this analysis, an additional 2,166 tonnes have been added to that value to account for material collected through the LCBO deposit-return program but not tallied in the EWSWA's diversion tonnage.

¹⁰ This does not include materials diverted through the private sector, such as thrift store donated goods or retail take-back programs. It does include the LCBO deposit-return program.

¹¹ Organic materials is comprised of food and kitchen waste (21.9%) and yard waste (19.2%). Food and kitchen waste includes both food waste (19.8%) and paper towels and tissue (2.1%).

Figure 2: Composition of Solid Waste (2010)

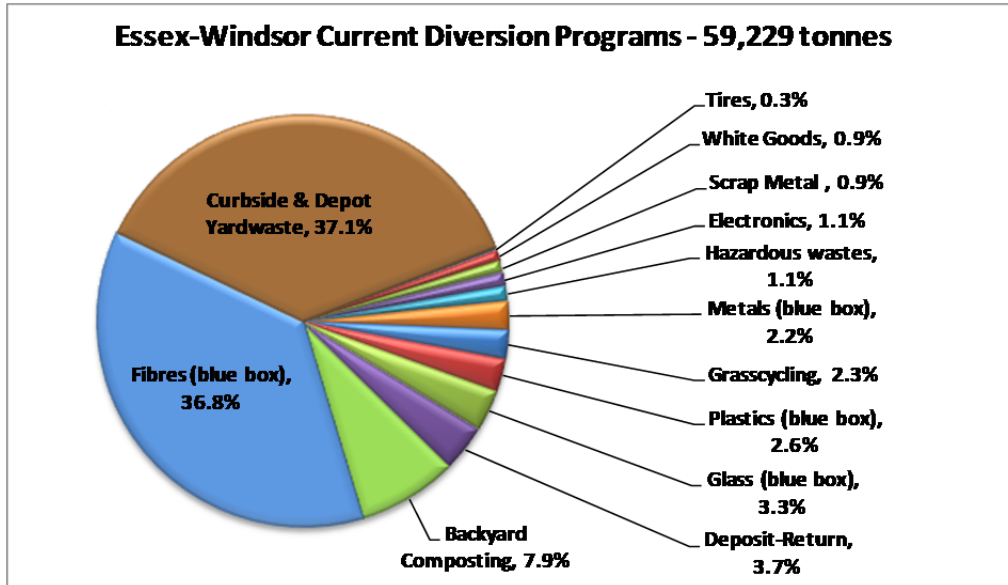


Notes:

- "Other Refuse" is comprised of non-recyclable glass, metals, plastics and paper, textiles, construction material, diapers and sanitary products and pet waste.
- Food waste and kitchen waste includes food waste (19.8%) and paper towelling and tissue (2.1%).
- Figures may not add to 100% due to rounding

Approximately 59,229 tonnes of waste was diverted from disposal in 2010. As Figure 3 shows, yard waste diversion and recyclable paper recycling were the largest contributors to this diversion.

Figure 3: Material Diverted from Disposal by Program (2010)



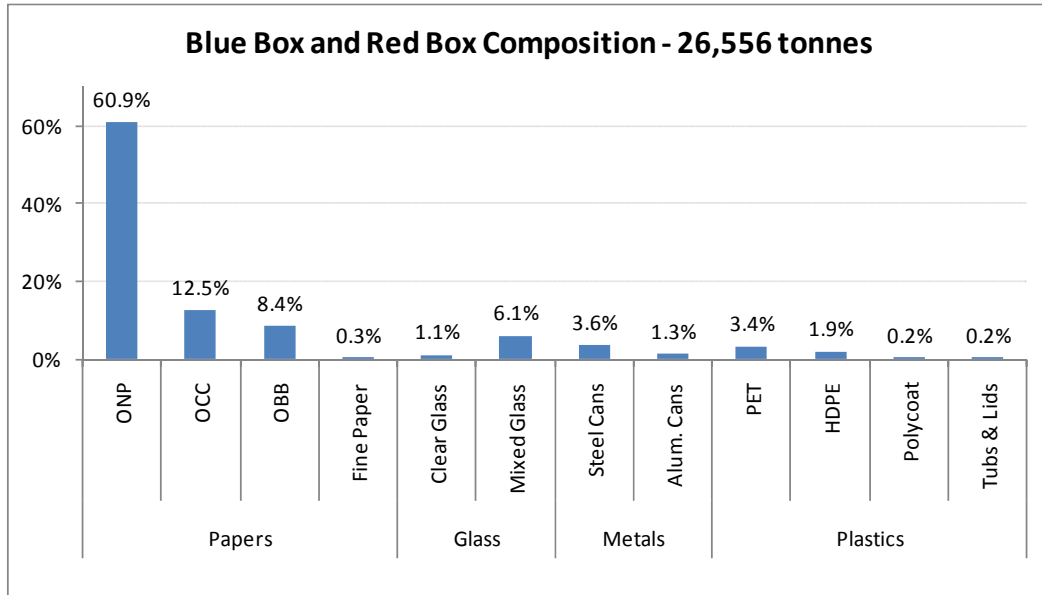
Note: Figures may not add to 100% due to rounding

4.1 Composition of Waste Diverted

4.1.1 Recyclable Material (Blue Box and Red Box) Stream

Based on the 2010 Annual Diversion Report, Essex-Windsor diverted 26,556 tonnes of recyclable material from the Regional Landfill through its blue box program. Recyclable paper accounts for the largest portion of this stream, making up 82% of the category. Recyclable metals make up the smallest portion of this category by weight, at 5.7%. Plastics also make up a small portion by weight (less than 6%), but they can consume a large volume of space compared to an equal weight of other recyclable materials. A detailed breakdown of the recyclable material stream is illustrated below in Figure 4.

Figure 4: Blue and Red Box Composition (2010)

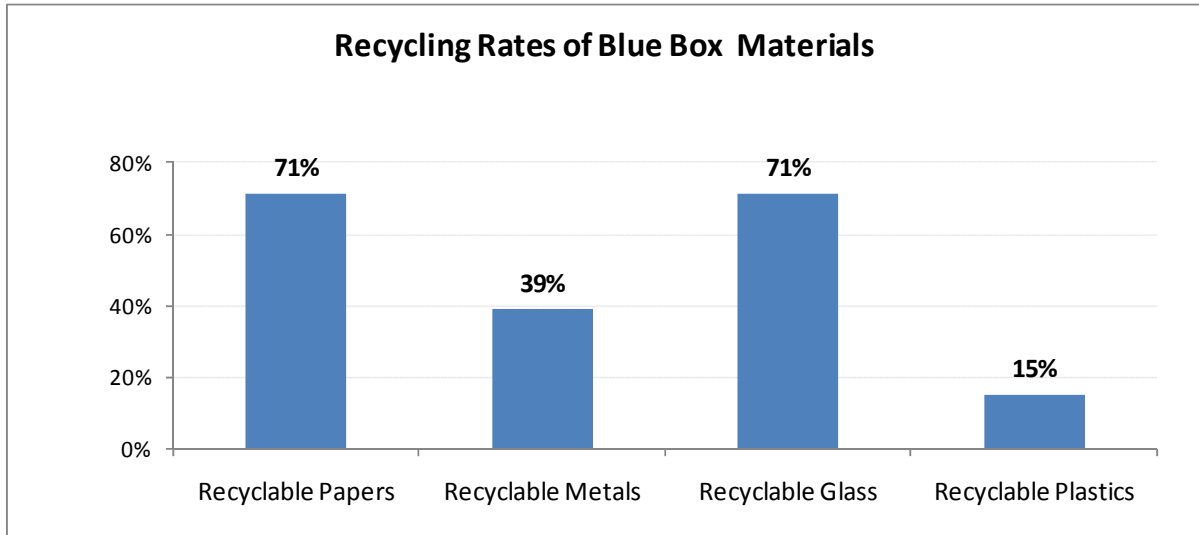


Note: figures may not add to 100% due to rounding.

In addition to the material diverted through the blue box program, another 2,166 tonnes of recyclable containers were diverted from disposal through the stewardship deposit-refund program (i.e., through drop-off at the Beer Store). A large portion of these materials (98%) were glass bottles. The balance of the materials diverted were aluminum containers (1%), steel containers and PET containers (each less than 1%).

Based on the waste composition analysis undertaken by the Authority (with the assistance of AET Group Inc.) during 2011, the total amount of Blue and Red Box materials available for diversion in Essex-Windsor is about 50,025 tonnes. Through the EWSWA's blue box program and the deposit-refund stewardship program, about 58% of this material was recycled in 2010 (which is less than the WDO recommended target recycling rate of 75% for Urban Regional municipalities). As illustrated in Figure 5, Essex-Windsor achieved the highest blue box recycling rates for recyclable glass (71%) and papers (71%), while recyclable plastics had the lowest recycling rate (15%).

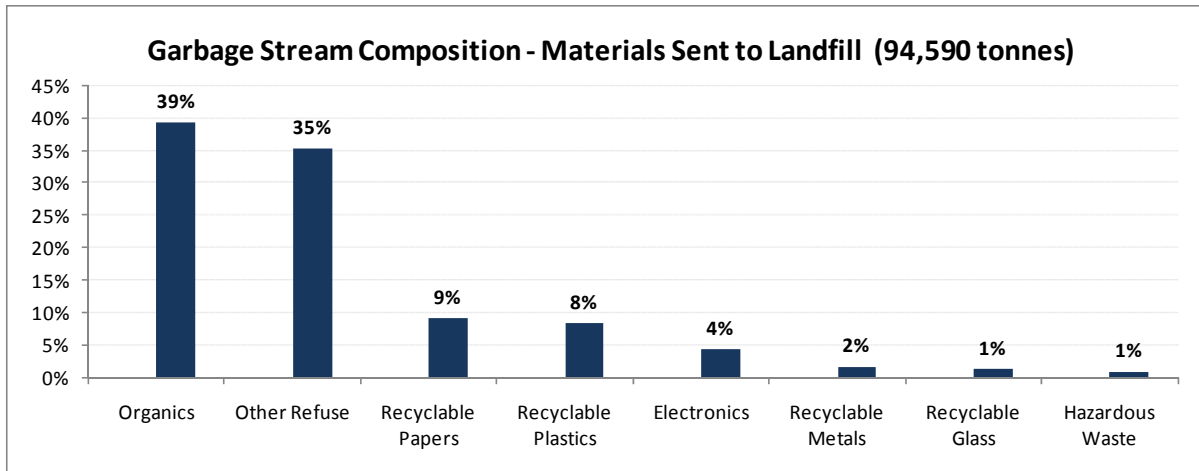
Figure 5: Blue and Red Box Material Recycling Rates.



4.1.2 Garbage Stream

In 2010, Essex Windsor sent 94,590 tonnes of residential curbside collected waste to landfill. Based on the 2011 waste audit, approximately 39% of this material was organics, which consisted mainly of food waste with some yard waste and compostable paper waste (such as tissues and paper towel). Other refuse¹² accounted for 35% of this stream, making it the second largest category. Materials that could have been accepted in Essex-Windsor’s recycling program made up 20% of the materials sent to landfill. A detailed breakdown is illustrated in Figure 6 (figures may not add up to 100% due to rounding).

Figure 6: Garbage Stream Composition (2010)



¹² “Other Refuse” includes items such as: non-recyclable/non-compostable paper; PET bottles containing liquid; non-recyclable plastics, metals and glass; diapers; sanitary products; construction and renovation wastes; and other miscellaneous wastes.

4.1.3 Organics Stream

According to the 2010 Annual Waste Diversion Report, Essex-Windsor diverted approximately 27,991 tonnes of residential organics material from landfill (including leaves, yard waste, tree trimmings, brush and some food waste). Of the organics diverted from landfill, 78.5% (or 21,974 tonnes) was diverted through Essex-Windsor's curbside and depot yard waste program, while 21.5% was diverted through on-site waste diversion practices (this includes 4,674 tonnes of food/yard waste through backyard composting and 1,343 tonnes through grasscycling). The total amount of organics estimated to be included within Essex-Windsor's residential waste stream is 63,097 tonnes (including paper towel and tissues). Currently, the EWSWA is achieving an overall capture rate for organics of approximately 44.4%. The individual capture rates for yard waste and food waste are 87.5% and 6.9%, respectively.

4.1.4 Municipal Hazardous and Special Waste (MHSW)

In 2010, MHSW accounted for an estimated 1,599 tonnes (or about 1%) of Essex-Windsor's total waste stream. Through depot collection and curbside motor oil diversion programs, the EWSWA diverted 674 tonnes of MHSW materials from landfill disposal. The 2010 capture rate for MHSW is 42.2%.

4.1.5 Waste Electrical and Electronic Equipment (WEEE)

In 2010, electronic waste accounted for an estimated 4,535 tonnes (or 2.9%) of Essex-Windsor's total waste stream. Through depot collection at the Public Drop-off Depot, the EWSWA diverted 623 tonnes of electronic waste from landfill disposal. The 2010 capture rate for these materials is 13.7%.

4.1.6 White Goods

In 2010, the EWSWA diverted 529 tonnes of white goods, such as refrigerators, washers, dryers and air conditioners. The County of Essex provides residents with curbside collection of white goods, which accounted for approximately 73% of the total amount of white goods diverted. The City of Windsor does not provide a curbside collection service for white goods, but operates a Refrigerator Round-up Program in cooperation with the EnWin utilities corporation and encourages residents to use local Public Drop-off Depots to divert white goods. The City of Windsor diverted the balance of white goods (27%) through those programs.

4.1.7 Tires

As mentioned earlier, Essex-Windsor provides residents with a tire diversion program with assistance from Ontario Tire Stewardship. In 2010, the EWSWA diverted 150 tonnes of tires from disposal at the landfill.

4.1.8 Scrap Metal

In 2010, the EWSWA diverted 540 tonnes of scrap metal from disposal through its depot drop-off program.

4.2 Waste Diversion Analysis

4.2.1 Essex-Windsor's Waste

Building upon the waste composition analysis, a waste diversion analysis was conducted to identify opportunities for additional waste diversion. Table 3 presents the results of the waste diversion analysis. The analysis considered the amount of additional material available for diversion assuming a capture rate of 75%¹³ could be achieved.

The analysis shows that the greatest opportunities for increasing overall waste diversion is through diverting more food waste and recyclable plastics. If the capture rate of food waste was elevated to 75%, nearly 23,000 more tonnes of organics could be diverted from landfill and increase Essex-Windsor's overall diversion rate by about 15 percentage points. Similarly, achieving a 75% capture rate of Essex-Windsor's recyclable plastics could divert an about 6,200 tonnes of waste from disposal and increase its overall diversion rate by 4 percentage points. Combined, these two categories could elevate Essex-Windsor's overall diversion rate by 19 percentage points to 57.5%.

In addition, the analysis indicates that small gains can be made through additional diversion of recyclable metals, glass and paper, WEEE and MHSW. Combined, raising the capture rates of these materials to 75% could add nearly 4 percentage points to Essex-Windsor's current diversion rate. With the other increases noted above, this could raise Essex-Windsor's overall diversion rate to about 61%¹⁴.

In the case of scrap metal, white goods, tires and yard waste, the analysis estimates that Essex-Windsor is capturing more than 75% of these materials. Therefore, a very limited amount would be available for additional diversion.

It is important to note that this table does not take into account the recycling of some of these materials through recyclers other than the EWSWA, such as the Computers for Kids program.

¹³ The Continuous Improvement Fund recommends 75% as a reasonable target for the percentage of blue box materials captured through the municipal recycling program for "Urban Regional" municipalities. This was applied as a target capture rate for all categories of divertible waste.

¹⁴ current diversion rate of 38.5% + additional diversion rate of 22.8% = 61.3%

Table 3: Materials Available for Diversion – Based on 153,819 tonnes of total waste generated by residents

Waste/ Resource Material	Estimated Composition (%) (re: Figure 2)	Total Divertible Material in Waste Stream (tonnes)	75% Capture Rate of Divertible Material (tonnes)	Material Currently Diverted through Existing Programs in 2010 (tonnes)	Potential Additional Diversion (tonnes)	Potential Additional Diversion (% of total waste stream)
Recyclable Paper	19.8%	30,480	22,860	21,773	1,087	0.7%
Recyclable Metals	2.3%	3,473	2,605	1,351	1,254	0.8%
Recyclable Plastics	6.7%	10,323	7,742	1,549	6,193	4.0%
Recyclable Glass	3.7%	5,665	4,248	4,049	200	0.1%
Food and Kitchen Waste	21.9%	33,717	25,287	2,337	22,950	14.9%
Yard Waste	19.2%	29,526	22,145	25,654	nil	nil
Tires	0.1%	150	112	150	nil	nil
MHSW	1.0%	1,602	1,202	674	528	0.3%
WEEE	2.9%	4,532	3,399	623	2,776	1.8%
Scrap Metal	0.4%	540	405	540	nil	nil
White Goods	0.3%	533	400	529	nil	nil
Divertible Materials in Total Waste Stream	78.3%	120,541	90,406	59,229	34,987	22.7%

The table shows that 78.3% of the 153,819 tonnes generated by residents is divertible. The remaining 21.7% represents refuse that is to be landfilled.

4.2.2 Comparison of Essex-Windsor with other Municipalities

Essex-Windsor's waste diversion performance was reviewed against other Ontario municipalities. Table 4 shows Essex-Windsor's 2010 waste diversion rate as well as the amount of residential waste generated, diverted and disposed compared to other municipalities in its WDO municipal grouping and other selected municipalities. Figures 7 to 9 illustrate how Essex-Windsor compares to other municipalities for key waste management indicators. The data used in this section come from the 2010 WDO datacall and from Essex-Windsor's 2010 Waste Diversion Report. Based on the data in the table and the figures, compared to the other municipalities in this sample:

- Essex-Windsor's residential waste diversion rate is below the average of 45%;
- The amount of residential solid waste generated per capita in Essex-Windsor is about average (average = 383 kg/capita/year);
- The amount of residential solid waste diverted per person in Essex-Windsor is below the average of 172 kg/capita/year.

However, it is important to note that most of those municipalities with greater diversion rates use a mix of the following waste management approaches:

- Curbside collection of food and kitchen organics;

- Bag limits, with either full or partial user pay;
- Every other week collection of garbage;
- Expanded blue box collection (where materials such as mixed plastics, plastic film, and other materials are accepted in the blue box); and
- Weekly collection of recyclables.

Table 4: Essex-Windsor's Performance Compared to Other Ontario Municipalities

Municipality	Total Res. Waste Diversion Rate	Pop.	Total Residential Waste Generated		Total Residential Waste Diverted		Total Residential Waste Disposed	
	%		Tonnes	Kg/ Capita	Tonnes	Kg/ Capita	Tonnes	Kg/ Capita
Urban Regional								
Essex-Windsor	38%	393,115	151,653	386	57,063	145	94,590	241
Simcoe County	58%	286,573	112,808	394	65,903	230	46,905	164
Durham Region	52%	621,500	229,630	369	118,458	191	111,171	179
Waterloo Region	51%	543,700	190,342	350	96,770	178	93,572	172
Niagara Region	42%	443,866	201,432	454	85,561	193	115,871	261
Ottawa	39%	917,641	337,894	368	131,093	143	206,801	225
Other Ontario Municipalities								
Halton Region	54%	487,418	194,787	400	104,270	214	90,517	186
York Region	52%	1,062,731	360,480	339	188,248	177	172,232	162
Hamilton	48%	528,504	214,897	407	102,499	194	112,399	213
Toronto	46%	2,520,709	840,041	333	387,961	154	452,080	179
Guelph	45%	122,986	42,903	349	19,094	155	23,808	194
Peel Region	43%	1,241,000	482,555	389	209,347	169	273,208	220
London	41%	385,680	149,900	389	60,746	158	89,154	231
Sarnia	35%	75,650	28,824	381	10,137	134	18,687	247
Chatham-Kent	32%	108,192	47,701	441	15,072	139	32,629	302

Figure 7: Comparison of Waste Diversion Rates (2010)

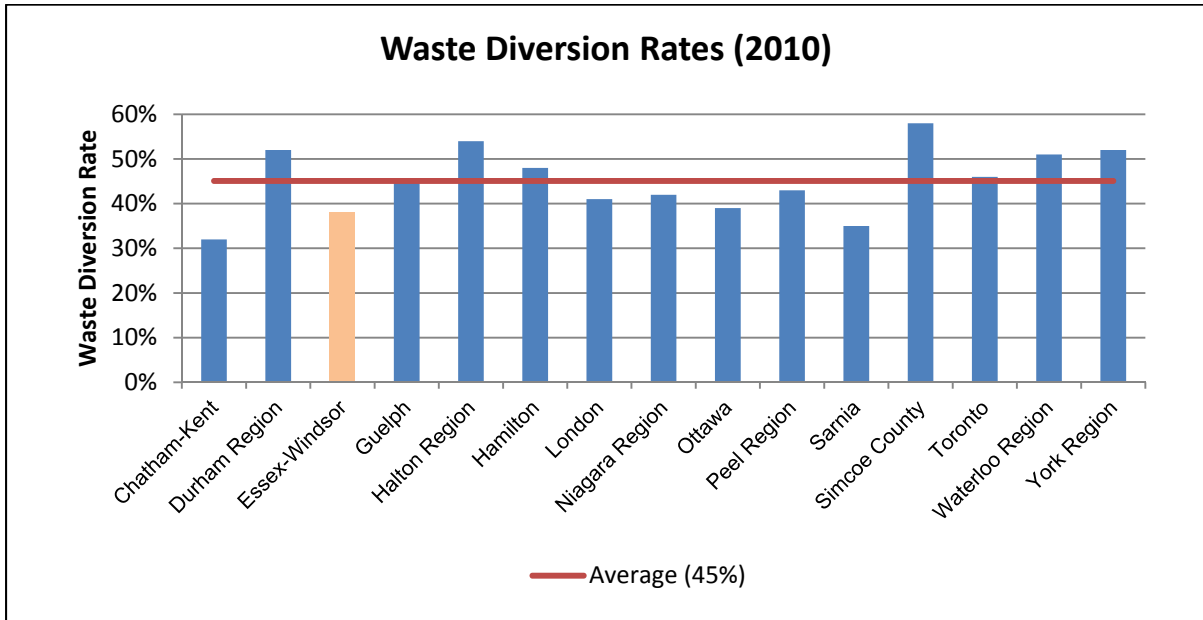


Figure 8: Comparison of Total Residential Waste Generated (2010)

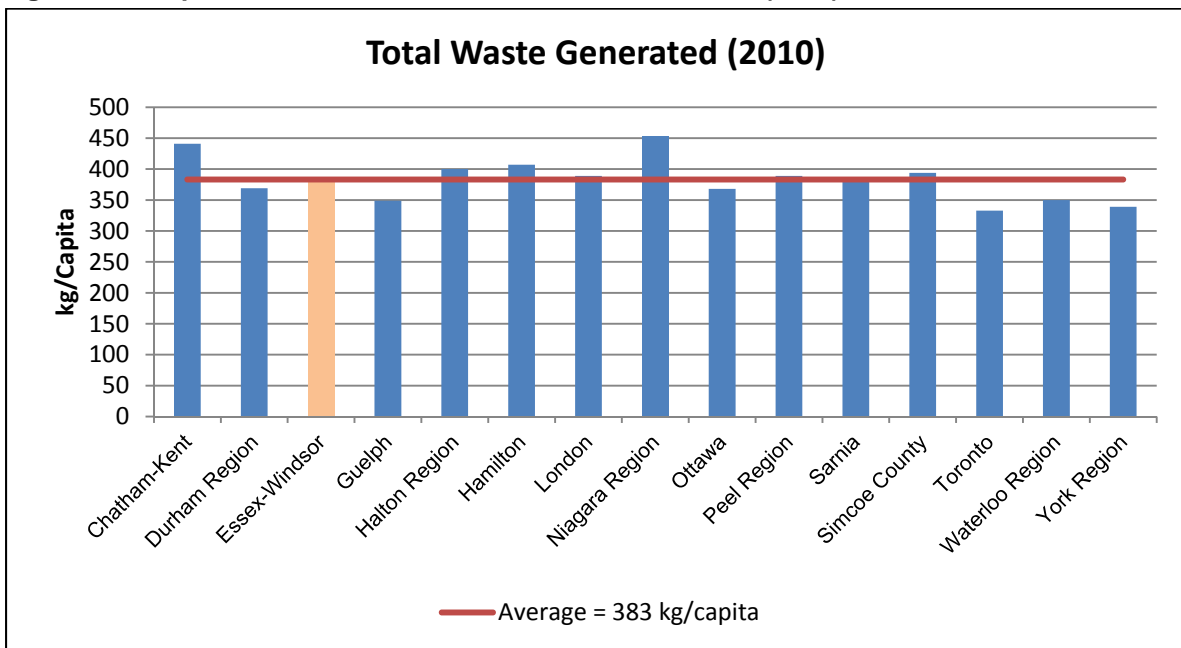
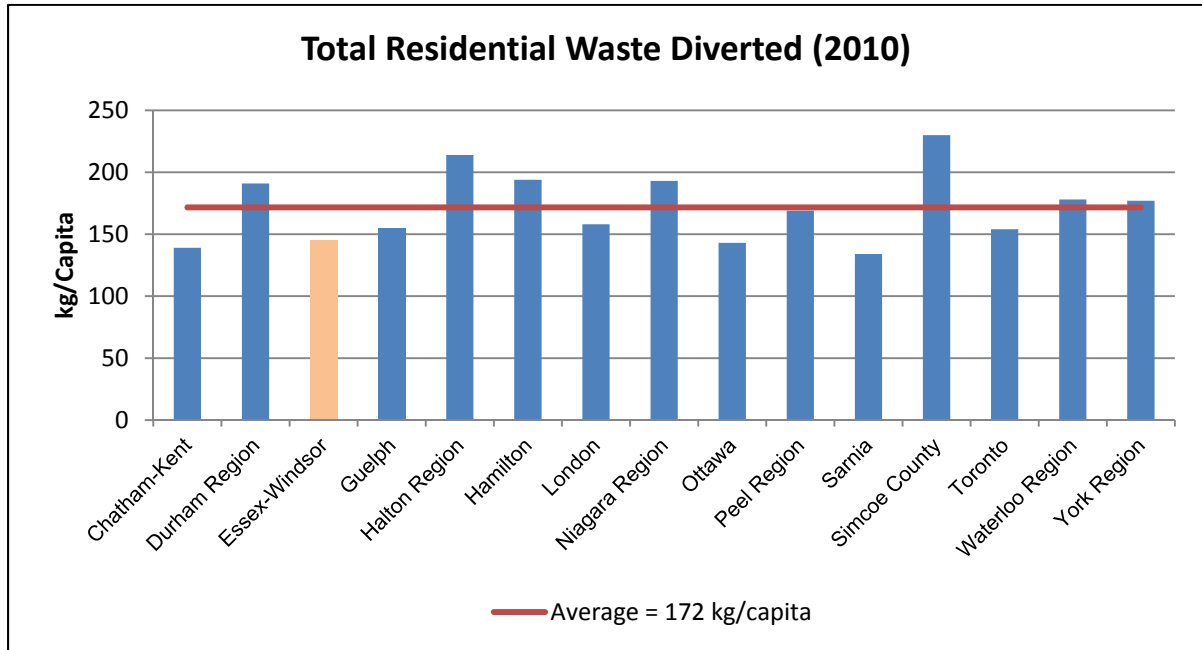


Figure 9: Comparison of Total Residential Waste Diverted (2010)



5 Projected Population Growth

In 2008, Essex-Windsor conducted a review of its Official Plan. As a part of that process, population and housing projections were prepared by Lapointe Consulting Inc for the City of Windsor and the County of Essex. These projections form the basis of projecting the EWSWA's waste management costs to 2031.

According to the population and housing projections by Lapointe¹⁵, the Windsor-Essex region is anticipated to grow from a population of 393,115 in 2010 to an estimated 491,821 by 2031. Housing is set to increase as a result of population growth at an average rate of 2,000 residential units annually. Based on current per capita waste generation rates, the total amount of residential waste to be collected curbside in Essex-Windsor is expected to increase by 25.1% (from 94,590 total tonnes per year to 118,340 tonnes per year in 2031). Based on the EWSWA's current waste management system and diversion rates, this corresponds to 118,340 tonnes of waste disposed and 74,101 tonnes of waste diverted annually by 2031. Anticipated future tonnages are represented in Table 5 below.

¹⁵ Lapointe Consulting Inc. Windsor-Essex and City of Windsor Population and Housing Projections, 2006-2031: Executive Summary. January 2008.

Table 5: Anticipated Future Growth of Waste Tonnages based on Current Practices.

Future Waste Generated, Disposed and Diverted			
	2010	2021	2031
Population	393,115	442,468	491,821
Total Waste Generated	153,819	173,130	192,441
Waste Disposed (tonnes)	94,590	106,465	118,340
Waste Diverted (tonnes)	59,229	66,665	74,101

The EWSWA is responsible for establishing, operating and managing the Regional Landfill, recycling collection and waste diversion for all municipalities with the Essex-Windsor region. Garbage and leaf & yard waste collection remains the responsibility of each individual municipality.

FINANCIAL INFORMATION

According to its 2010 audited financial statements, total expenses for the EWSWA amounted to \$23,400,730, while revenues were \$23,402,094.

Expenses incurred by the EWSWA are comprised of:

- Administration;
- Realty;
- Recycling collection and processing;
- Municipal Hazardous and Special Waste (MHSW) collection;
- Waste reduction and reuse programs;
- Advertising and public education;
- Perpetual care of landfill sites;
- Operating the Regional Landfill; and
- Operating two transfer stations and Windsor Public Depot.

Revenues collected by the EWSWA are comprised of:

- Tipping fees;
- Sale of recyclable materials;
- Recovery of perpetual care costs;
- Rent;
- Interest income;
- Sale of scrap metal;
- Stewardship Ontario funding for recycling, MHSW, tires, public education and electronics;
- Sale of blue boxes; and
- Sale of organic material.

In general, Essex-Windsor's waste management costs are comparable or lower than other municipalities with similar characteristics.

On average, Essex-Windsor's urban Blue Box collection program costs \$85 per tonne, which is significantly lower than other municipalities with similar demographics:

- Kitchener/Waterloo: \$167 per tonne;
- London: \$172 per tonne; and
- Hamilton: \$170.

Essex-Windsor's rural Blue Box collection cost is \$148 per tonne, which is also significantly lower than municipalities in Southern Ontario with similar programs:

- Simcoe County: \$222 per tonne;
- Norfolk: \$278 per tonne; and
- Brant County: \$392 per tonne.

Essex-Windsor currently spends \$14 per tonne on landfill operations, which are also similar or below other similar municipalities:

- Halton Region: \$36 per tonne;
- Brant County: \$35 per tonne; and
- Waterloo Region: \$26 per tonne.

6 Options to Consider to Increase the Diversion of Waste from Disposal

Because no two municipalities are exactly alike, approaches to waste management will differ between jurisdictions. Local conditions such as geographic location, density of households, social demographics, fiscal realities, etc will influence what waste diversion options are feasible for a municipality.

In order to select the most appropriate waste management options for Essex-Windsor, it is important to review the options that are available. **This section presents a list of 16 possible options for optimizing how residential solid waste is managed in Essex-Windsor. It is important to note that these are not the recommended options; rather, it is a broad list of options to be considered when updating the SWMMP.** The review describes the possible options, where possible describes how they have been applied in other jurisdictions, and notes the estimated cost and potential diversion. **The discussions of the options are concluded with recommendations, which are summarized in Section 8.**

6.1 Garbage Bag Set Out Limits (Recommended)

In Essex-Windsor, garbage bag set out limits are currently in place for residents of Lasalle (6 bags), Kingsville (5 bags) and Leamington (4 bags); the other municipalities do not have garbage bag set out limits, and residents of those municipalities are therefore able to set out as many bags of garbage as they wish. Bag limits are identified in the KPMG *Blue Box Program Enhancement and Best*

Practices Assessment Project Final Report as a fundamental best practice to induce waste diversion, and it is included in the WDO's *Best Practice Questions for Inclusion in the 2009 Municipal Datacall*.

Bag limits are used to limit the number of bags a household can set out at the curb for collection. Having a limit on the number of bags of garbage encourages households to put more of their divertible waste into the appropriate waste streams (e.g., recycling and organics). The KPMG report notes that communities that impose bag limits of less than three bags generally experience a noticeable reduction in the amount of waste sent for disposal and an increase in the amount recycled. The report organizes bag limits into three categories:

- Strict bag limit – no bags of waste are allowed over the set limit.
- Partial bag limit – households can purchase tags for bags in excess of the bag limit. This is also referred to as Partial User Pay.
- Hybrid system – while households can purchase tags for bags in excess of the bag limit, there is a limit to the total number of bags set out at the curb (e.g., a limit of x non-tagged bags plus y tagged bags).

Bag limits are common in Ontario. For example, more than 100 municipalities have bag limits, and more than 50 of them have bag limits combined with user pay (for more on user pay, see Section 6.2). Of the 14 municipalities in Ontario that have more than 50% waste diversion¹⁶, ten have bag limits. Table 7 (following page) presents a summary of user fees and bag limits from selected Ontario municipalities, including those in EWSWA's municipal grouping, nearby municipalities, and other municipalities from the Greater Golden Horseshoe.

In York Region, the Town of Markham requires a bag tag on all garbage bags over their three-bag limit. However, the Town does not charge for the bag tags, and residents must obtain them from either the Town's Civic Centre or a recycling depot. While Markham places no limit on the number of tagged bags that can be set out, other municipalities in York Region do, setting a maximum bag set out limit (untagged + tagged bags).

The waste audit commissioned by the EWSWA in 2011 also examined set out rates. During the study, garbage was collected from households for a total of 200 instances (100 different households receiving collection on two separate weeks). Of those 200 instances, there were 145 instances where households set garbage out at the curb for collection. As table 6 shows, 75% of those households had set out 2 containers of garbage or less, while 88% had set out three containers or less.

Table 6: Garbage Set-Outs

Number of Containers	Number of Occurrences (145 setouts)	Percent of Occurrences	Cumulative Total
1	67	46%	46%
2	42	29%	75%
3	18	12%	88%
4	11	8%	95%
5	3	2%	97%
6	3	2%	99%
More than 6	1	1%	100%

¹⁶ Based on 2009 WDO datacall.

Table 7: Examples of Bag Limits (5 bags or less) and User Pay in Select Ontario Municipalities

Municipality	Pop.	Residential Diversion Rate	Garbage Bag Limit	User Pay	
				Partial User Pay	Full User Pay
Large Urban					
York Region	1,032,606	57%	Markham, Richmond Hill, Aurora, Newmarket, Vaughan, Stouffville: 3 bags King, East Gwillimbury: 2 bags Georgina: 1 container	Yes (range from free-\$2.40)	No
Peel Region	1,220,000	50%	2 Bags (each additional bag tagged)	Yes (Tag Price: \$1)	No
Hamilton	525,697	46%	1 container	No	No
London	381,990	42%	4 containers	No	No
Urban Regional					
Simcoe County	322,120	57%	1 container (each additional bag tagged)	Yes (Tag Price: \$3)	No
Durham Region	614,960	51%	4 Bags (each additional bag tagged)	No	Yes (Tag Price: \$1.50)
Niagara	442,908	44%	1 Bag (each additional bag tagged)	Yes (Tag Price: \$1)	No
Essex-Windsor	393,115	35%	LaSalle – 6 containers Kingsville – 5 containers Leamington – 4 containers Other locations – no limits	No	No
Ottawa (City)	908,389	33%	3 Bags	No	No
Medium Urban					
Sarnia	75,208	33%	4 Bags	No	No
Brantford	93,399	30%	5 Bags	No	No
Rural Regional					
Chatham-Kent	108,192	33%	4 Bags	No	No

Estimated Diversion and Cost

- Estimated Additional Diversion: 2% to 6% (3,000 – 9,000 tonnes)
- Estimated additional Cost: Minimal (promotion, education and enforcement)

Recommendation

It is recommended that the EWSWA propose to Essex-Windsor's individual municipalities that they move to a garbage bag limit of three bags or containers in the short term, to be reduced to a limit of two bags as new waste diversion programs are implemented, for the following reasons:

- Bag limits are considered a waste management best practice;
- Bag limits have been shown to encourage participation in waste diversion programs and increase waste diversion;
- Bag limits are commonly used in municipalities across Ontario and North America;

- Based on the survey of set out rates conducted in 2011, most households should be able to conform to a three bag limit (and a subsequent two bag limit at a later date).

6.2 Bag Tags or User Pay Garbage Collection (Not Recommended)

User pay programs, also known as Pay-As-You-Throw (PAYT), unit-based pricing, variable rate and user fee, are becoming an accepted method for financing residential waste management services. By directly charging residents for their waste production, householders are more directly responsible for their waste generation and disposal habits. User pay schemes can be full or partial. In full schemes, residents pay for each unit of waste set out for collection. In partial systems, residents only pay over a set limit (e.g., they can set out one bag without a tag, while subsequent bags must be tagged). Table 7 (previous section) presents some examples of user pay fees in selected Ontario municipalities.

Numerous studies have shown that municipalities introducing user pay programs generally see increased diversion and reduced disposal rates.

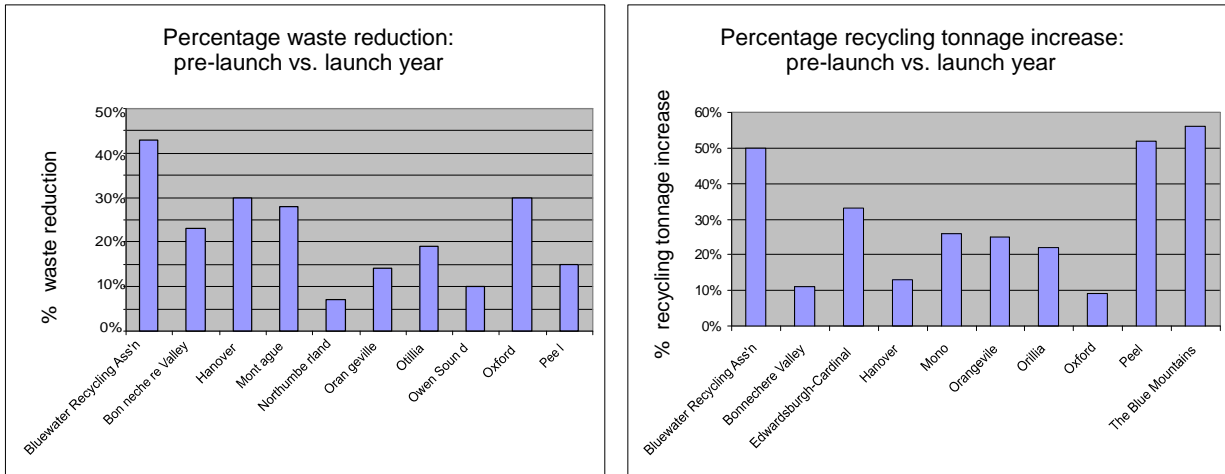
In 2001, EnviroRIS Ltd. conducted a study on behalf of the City of Toronto on the impacts of bag limits and PAYT programs. The study noted that at that time all user pay/PAYT programs in Canada and the United States were “volume based” systems. Most of the user pay/PAYT communities included in the study used one of two systems: either a tag system or a variable standardized container system. In general, most Canadian user pay programs were found to use the tag system, whereby residents are required to purchase tags that they attach to some or all of the bags/cans of garbage set out for collection. Municipalities included in the research were found to decrease the amount of waste disposed by up to 30% after implementation of their user pay system¹⁷.

The Association of Municipal Recycling Coordinators (AMRC) conducted an analysis of User Pay system costs in Ontario in a project funded by Stewardship Ontario’s Effectiveness and Efficiency Fund (E&E Project 191). The analysis studied six municipalities in Ontario with user pay systems (four of which were not included in the 2001 EnviroRIS study) and found increases in recycling tonnage ranged from 22% to 86% and that decreases in waste tonnage ranged from 6% to 61% after implementation of user pay¹⁸. In Figure 10 below (adapted from AMRC’s User Pay Program Implementation Guide, 2005) illustrates the waste decreases and recycling increases experienced by 10 Ontario municipalities after implementing user pay programs.

¹⁷ EnviroRIS. *The Waste Diversion Impacts of Bag Limit and Pay As You Throw Systems in Selected Communities in North America*. April, 2001

¹⁸ Association of Municipal Recycling Coordinators. *Analysis of User Pay System Costs in Ontario: E&E Project 191*. September 2006.

Figure 10: Changes in Waste Disposed and Recycled after User Pay Implementation



Adapted from Association of Municipal Recycling Coordinators. User Pay Program Implementation Guide. Revised December 2005.

Implementing a successful user pay system would require the following elements:

- **Education:** Residents need to receive enough information regarding the program and adequately understand what it entails.
- **Expanding Acceptable Materials in Other Diversion Programs:** To limit the amount of user fees residents incur, Essex-Windsor should provide as many alternatives to waste disposal as possible.
- **Bag Tag Distribution:** In order to succeed, residents must have easy access to bag tags, if that specific option is chosen. Bag tags should be available at convenient locations such as grocery stores, city halls, post offices, municipal buildings, drop off depots and the landfill.

The costs associated with this option are mostly in the form of education and promotion. Promotion and educational costs can be incorporated into Essex-Windsor's current promotional budget. Printing tags and mailing them to residents is a relatively low cost option.

For example, Durham Region has a 4 bag limit and any additional bags must be tagged. The cost of printing tags is approximately \$6,500 per 10,000 tags¹⁹.

The Town of Mississippi Mills, near Ottawa, has a full bag tag program where all bags of garbage must be tagged for collection (although the first 40 tags are free of charge for residents). In total, for roughly 5,000 households, the program costs \$4,590 per year²⁰. Costs associated with bag tags include education, tag printing, envelopes for mailing of tags and postage. This amounts to roughly \$1 per household per year.

¹⁹ Conversation with Durham region Waste Services Co-ordinator, Sept 28th, 2011.

²⁰ Town of Mississippi Mills Budget Committee Report, 2010.

Estimated Diversion and Cost

- Estimated increased diversion: 4% to 6% (6,100 – 9,200 tonnes), or more if food waste organics is introduced.
- Estimated Cost: Based on a cost of 65 cents to print each tag plus an additional 10 per cent administration cost, and assuming each single-family household would require three bag tags on average, the estimated cost to print and distribute bag tags to single-family homes in Essex-Windsor is about \$85,000 per year²¹. Does not include revenue offsets.

Recommendation

- Currently, bag tags are not recommended for Essex-Windsor, as there appears to be little public support for such a measure.

6.3 Reduction in Garbage Collection Frequency (Not Recommended)

While reducing garbage collection frequency has been shown to increase waste diversion, it should be done in conjunction with other waste diversion programs, including a kitchen and food waste collection program (See Section 6.6), to reduce the amount of putrescible waste residents send to landfill. With an expanded blue box program and a weekly kitchen and food waste curbside collection program, garbage collection could be reduced from weekly to bi-weekly to encourage residents to make greater use of available diversion programs. Implementing this strategy could potentially generate negative feedback from residents and increase contamination of recycling and organics streams, but this can be addressed through strong waste management promotion and education.

While costs for collection of refuse could go decrease by approximately 10 to 20 percent, the expected increase in recycling and organics diversion will drive up their associated collection and processing costs (which may be offset by any additional resulting recycling revenues). Reduction in the collection frequency of garbage has resulted in increases in recycling and organics diversion in other municipalities in southern Ontario. For example, York and Halton Regions reported a 4-6% increase in diversion from landfill after implementing bi-weekly garbage collection. Table 8 lists selected municipalities with either weekly or bi-weekly garbage collection.

²¹ Assumes: printing costs similar to Durham Region; distribution of through retailers or municipal service outlets; multi-residential households not included in calculation.

Table 8: Garbage Collection Frequency

Municipality	Frequency of Garbage Collection
Large Urban	
York Region	Bi-weekly
Halton Region	Bi-weekly
Peel Region	Weekly
Hamilton	Weekly
Toronto	Bi-weekly
London	Weekly
Urban Regional	
Simcoe County	Weekly
Durham Region	Bi-weekly
Region of Waterloo	Weekly
Niagara	Weekly
Essex-Windsor	Weekly
Ottawa (City)	Weekly
Medium Urban	
Guelph	Bi-weekly
Sarnia	Weekly
Brantford	Weekly
Rural Regional	
Oxford	Weekly
Bluewater Recycling	Mix of weekly and bi-weekly
Chatham-Kent	Weekly
Norfolk	Weekly

Note: The municipalities listed above with bi-weekly garbage collection also have weekly organics collection, except for those serviced by the Bluewater Recycling Association. All have weekly recycling collection except for Essex-Windsor, Oxford and Sarnia (dual stream collected bi-weekly).

Estimated Diversion and Cost

- Estimated diversion: 2% - 4% (3,100 – 6,200 tonnes)
- Estimated cost savings: to be determined through tender process

Recommendation

It is not recommended to carry this option forward at this time, as a curbside food and kitchen organics program should be in place prior to moving ahead with this option. However, municipalities should consider this option if the EWSWA proceeds with curbside collection of food and kitchen organics.

6.4 Implementing a Clear Bag Policy for Garbage Collection (Not Recommended)

A 'clear bag' program refers to the use of a garbage bag that is transparent or see-through. Use of clear bags for garbage encourages waste diversion in a number of ways. Knowing that their neighbours will be able to observe that there are recyclable, organics or hazardous materials in their garbage acts as a form of peer pressure to recycle. Secondly, clear bags can serve as a reminder if people forget to separate out these materials from their garbage, as the clear bag allows residents to see what has been thrown out. Clear bags also prompt people to reflect on their waste disposal habits and encourage them to consider waste diversion options. Lastly, clear bags can also assist enforcement programs by allowing waste collectors to monitor for compliance with existing waste management regulations.

A Stewardship Ontario study that examined 22 municipalities with clear bag programs concluded that this option could have a considerable increase on diversion rates. For example, 13 Nova Scotia municipalities reportedly experienced, on average, a 41% decrease in residential waste, a 35% increase in residential recycling and a 38% increase in residential organics collection. One region from Nova Scotia experienced a 71% increase in tonnes of material collected for recycling. It is important to note that these averages were based on programs with existing recycling programs and organics diversion and therefore most of the gains can be directly attributed to clear bags²².

Prince Edward Island has a province-wide clear bag program which enabled it to reach a 65% diversion rate in 2003. The recycling tonnage collected doubled and has remained relatively constant after implementing a clear bag program. This increase can be directly attributed to the clear bag program as recycling was made mandatory prior to the clear bag program.

Durham Region initiated a clear bag pilot project in 2009 and found that diversion could increase by 3 percentage points if implemented region-wide. The study also concluded that participation in recycling was unaffected, but it did increase participation in organics diversion by 14%.

The Municipality of Centre Hastings and Madoc Township conducted a clear bag pilot project in 2008 and concluded that participation in blue box recycling doubled in the first month of enforcement. In total, blue box diversion increased by 9% over the first 6 months of the trial period.

In some programs, residents are allowed to include a 'privacy bag' inside their clear bag. A 'privacy bag' is a small opaque plastic bag into which residents can place materials they wish to keep private.

Unless custom bags issued by the municipality are used, the only costs for implementing this program are enforcement and promotion and education. Promotion and education could be managed through Essex-Windsor's existing promotion and education budget. Enforcement would require training of collections staff in identifying recycling and organics in the waste stream. Additional costs would likely be negligible and could be incorporated with promotion and education.

Table 9 provides a list of selected Canadian municipalities that have implemented or piloted tested clear garbage bags and have reported changes in waste diverted.

²² Stewardship Ontario. *The Use of Clear Bags for Garbage as a Waste Diversion Strategy: Background Research on Clear Garbage Bag Programs Across North America*. 2008.

Estimated Diversion and Cost

- Estimated diversion increase: 1% to 6% (1,500 to 9,200 tonnes)
- Estimated costs: depends on if tied to mandatory recycling and level of enforcement

Recommendations

It is not recommended that the EWSWA or its partners proceed with this option at this time as there is little public support for this option and there are other reasonable opportunities for increasing waste diversion that can be implemented instead.

Table 9: Examples of Programs with Clear Bag Garbage Programs

Municipality or Region	Population	Start Date	Other Waste Management Program Elements	Program Results
Durham Region	614,960	2009 (pilot)	<ul style="list-style-type: none"> • Recycling • Organics • Bag limit • User pay 	<ul style="list-style-type: none"> • Organics – participation increased 14%
The Municipality of Centre Hastings and Madoc Township		2008 (pilot)	<ul style="list-style-type: none"> • Recycling 	<ul style="list-style-type: none"> • Recycling – participation doubled, tonnage increased by 9%
Township of Amaranth, Ontario	3,500	January 1, 2005	<ul style="list-style-type: none"> • Mandatory recycling • Organics 	<ul style="list-style-type: none"> • Disposal rate decreased
Township of East Luther Grand Valley, Ontario	2,526	August 2004	<ul style="list-style-type: none"> • Mandatory recycling • Organics • Partial user pay 	<ul style="list-style-type: none"> • Increased recycling collected • Increased organics and leaf and yard waste collected
Counties of Antigonish and Guysborough, Nova Scotia	29,290	October 2005 to March 2007 depending on municipality	<ul style="list-style-type: none"> • Mandatory recycling • Organics • User pay 	<ul style="list-style-type: none"> • Garbage – tonnage decreased by 37% • Recycling - tonnage increased by 71%
Pictou County, Nova Scotia	49,000	January 2, 2006	<ul style="list-style-type: none"> • Mandatory recycling • Organics • Bag limits 	<ul style="list-style-type: none"> • Garbage – tonnage decreased by 30% • Recycling - tonnage increased by 9% • Organics - tonnage increased by 27%
Counties of Yarmouth and Digby, Nova Scotia	45,007	April 2007	<ul style="list-style-type: none"> • Mandatory recycling • Organics • Bag limits 	<ul style="list-style-type: none"> • Garbage – tonnage decreased by 25% • Recycling - tonnage increased by 12% • Organics - tonnage increased by 24%
Province of Prince Edward Island	138,000	2002	<ul style="list-style-type: none"> • Recycling • Organics 	<ul style="list-style-type: none"> • Recycling - tonnage doubled (from 7,161 tonnes in 2001 to 14,415 tonnes in 2003)

6.5 Region Wide Junk Collection Events/Days (Not Recommended)

Currently, only the Town of Leamington provides a “Junk” collection day to residents as a separate collection program. Junk is defined as oversized refuse and includes items such as mattresses,

couches and sofas. Residents must call at least a week in advance to schedule a pickup and these items are collected on the fourth week of every month.

All other County municipalities accept oversized refuse with their regular garbage and no advanced scheduling is required. For the City of Windsor residents, although there is no curbside collection for large items, residents are able to take their materials to the public drop-off depot.

Recommendation

Expanding the Junk collection days to the whole Essex-Windsor area is not recommended at this point in time, as City of Windsor residents currently have proximate access to a depot location.

6.6 Food and Kitchen Organics Collection and Processing (Study Recommended)

According to the waste diversion analysis found in this 2011 Master Plan report, in 2010 Essex-Windsor generated approximately 63,000 tonnes of organics (including leaf and yard waste, food waste, and non-recyclable paper such as paper towels and tissues). Less than half (42%) of this material was diverted through organics diversion programs in Essex-Windsor, such as leaf and yard waste composting and backyard composting.

Approximately 53% of Essex-Windsor's organics (or 33,700 tonnes) is food and kitchen organics, which includes food scraps and non-recyclable compostable paper such as paper towels and tissues. While most of Essex-Windsor's yard waste is being composted, only 7% of Essex-Windsor's food and kitchen waste is being diverted (primarily through its backyard composting programs).

The food and kitchen organics currently going to landfill represents a significant opportunity for Essex-Windsor to raise its waste diversion rate, as it comprises about 22% of Essex-Windsor's entire waste stream. Capturing 75% of Essex-Windsor's food and kitchen organics waste for composting could raise the waste diversion rate by nearly 15 percentage points (nearly 23,000 tonnes).

To capture food waste, many municipalities offer a curbside household organics (i.e. Green Cart) program (see Table 10 for a list of GTA, Urban Regional and other nearby municipalities with a curbside organics program). In these programs, residents are provided with a green cart and a smaller kitchen-counter bin (also known as a mini-bin). Residents place their food and kitchen wastes into to the mini-bin instead of their garbage. The mini-bin would then be emptied into the green cart, and the contents would be collected alongside recycling, garbage and leaf & yard waste. Collection of curbside household organics is typically weekly.

Table 10: Municipal Food Waste Composting Facilities

Municipality	Number of Households (single and multi)	Green Cart Organics		Municipal Facilities			
		tonnes	kg/hhld	Location Processed	Type of Facility	Capacity of Facility (per year)	Facility Cost
Large Urban							
Halton Region	171,478	26,773	156	Hamilton facility	-	-	-
Toronto	943,794	109,077	116	Disco Road Facility	Anaerobic digestion process	75,000 tonnes	\$50M (2011)
				Dufferin Green Bin Facility		25,000 tonnes	\$15M (2003)
London	162,087	pilot testing		Orgaworld (London)	-	-	-
York Region	308,852	52,906	171				
Hamilton	208,183	37,696	181	Municipal facility	In-vessel	90,000 tonnes	\$25M (2008)
Peel Region	395,000	36,274	92	Peel Integrated Waste Management Facility	Concrete Tunnels	60,000 tonnes	\$48M (2007)
Urban Regional							
Durham Region	203,969	27,593	135	Orgaworld (London)	-	-	-
EWSWA	153,529	no program	na	na			
Region of Waterloo	191,170	7,749	41	Private facility	-	-	-
Simcoe County	123,365	11,460	93	Hamilton facility	-	-	-
Region Of Niagara	186,504	11,592	62	Private facility (Walker Environmental Group)			
Ottawa (City)	369,271	53,348	144	Private facility (Orgaworld)			
Medium Urban							
Guelph	44,993	new system (2012 roll-out)		na	In-vessel	30,000 tonnes	\$30M (2011)

Such a program could be implemented either county-wide or depending on rural collection costs, only in the urban/suburban areas. Collection costs would likely be lower in the urban/suburban areas as homes are placed more closely together and collection crews can make more stops per unit time and per kilometre. If initial implementation is limited to urban/suburban areas, then the EWSWA could assess the feasibility of expanding the program into the remaining rural areas. An emphasis on backyard composting in the rural areas could also be considered in lieu of rural curbside collection of food waste.

The cost to collect additional organic material through a curbside collection program is approximately \$100 per tonne for food waste. The cost to process food/kitchen wastes can range between \$80 to \$120 per tonne depending on the technology or processing facility used. For example, Orgaworld Canada Ltd, which accepts all of the City of Ottawa's organic material, accepts organic materials for

processing at a rate of \$100 per tonne. The City of Hamilton accepts household organics from outside municipalities for a processing fee of approximately \$90 per tonne.

With regards to implementation, the cost to roll out an organic curbside collection program to homes in York Region was approximately \$20 per household for the purchase and delivery of containers and \$5 per household for promotion and education materials, for a total of \$25 per household.

Therefore, the capital cost to purchase and initiate curbside organics collection for Essex-Windsor, excluding multi-residential units, could cost about \$2,000,000. This assumes that the program will be rolled out County-wide, will be a cart-based system, and that organics will be exported for processing at another facility.

Estimated Diversion and Cost

Estimated diversion and costs assumes a mature program that is implemented county-wide. As with any diversion program, participation rates and collected tonnages will be at its lowest in the early period of the program, but should increase as the program matures and becomes more engrained in the community.

Costs will likely be lower if the program focuses solely on urban/suburban households, as fewer households in the program will result in less food waste organics collected curbside and processed.

- Estimated diversion: 15% (23,000 tonnes)
- Estimated annual operating costs:
 - Collection: \$100/tonne x 23,000 tonnes = \$2.3 M
 - Processing: \$80 - \$120 per tonne x 23,000 tonnes = \$1.8 to \$2.8 M (does not include capital costs of building own facility)
- Program implementation cost (carts, promotion and education, and roll-out): \$25/household x 98,000 households: \$2.5 M

Recommendation

It is recommended that the EWSWA conduct a study to assess the feasibility of collecting and processing food and kitchen waste organics from households in Essex-Windsor. The study should include (but may not be limited to):

- More detailed analysis of collection costs, including required equipment (e.g., carts and mini-bins, split body collection trucks, etc.);
- The cost-effectiveness of implementing the program County-wide or just in urban or suburban areas;
- The cost-effectiveness to construct a processing facility in Essex-Windsor to process the material (and potentially material from other municipalities) versus exporting the material to a private or other municipal facility;
- The type of processing facility to construct, if it is determined that processing should be undertaken by the EWSWA;
- Opportunities to cost-share with other municipalities (e.g., a regional composting facility);

- Opportunities for cost-savings in garbage and recyclables collection (e.g., every other week garbage collection, co-collection of garbage or recyclables, etc); and
- An implementation strategy (which should include pilot testing communication material, household collection, etc.).

This recommendation has been put forward because:

- Food and kitchen waste provides Essex-Windsor with its greatest opportunity for increasing waste diversion;
- Without diversion of food and kitchen waste, Essex-Windsor is unlikely to achieve the targets outlined in the 1993 Master Plan or the provincial target of 60% waste diversion;
- Experience with municipal collection methods and composting technologies in Ontario and other parts of Canada has increased in the past five years (e.g., new facilities in Hamilton, Guelph, Peel, Toronto, Ottawa, etc), and municipal composting programs are becoming more commonplace; and
- Essex-Windsor may have the flexibility to either build its own facility (and potentially earn revenue by processing organics from other neighbouring municipalities) or export food and kitchen organics to another facility.

6.7 On-site Management of Organics (Recommended)

Centralized composting of household and yard waste organics can significantly help reduce the amount of waste disposed and provide other environmental benefits. However, another option that can help achieve these benefits while reducing municipal collection, transport and processing costs is the on-site management of organics by residents. The main modes of this are backyard composting and grasscycling.

Backyard Composting

Essex-Windsor has approximately 98,000 single-detached houses (excluding single-detached houses that form part of a condominium, semi-detached homes or row-housing)²³. If it is assumed that approximately 75% have some form of back yard, then there are approximately 73,500 households that could be equipped with a backyard composter. The Authority's 2010 Annual Waste Diversion Report notes that 36,165 units have been sold since 1988 and estimates that 76% are still in use. Therefore, there are approximately 46,000 households remaining that could potentially be outfitted with a backyard composter. At 100 kg/year/composter, this translates to the potential additional diversion of up to 4,600 tonnes of kitchen organics and leaf and yard waste through on-site management.

While no examples of mandatory backyard composting programs have been identified, many municipalities try to encourage backyard composting through promotion and education and offering subsidized or free backyard composters. For example, the Township of Langley, BC recently conducted a Community-Based Social Marketing backyard composting study and identified the following as potential barriers:

- The convenience of other disposal methods, such as the garbage or a garburator;
- Lack of a perceived benefit;
- Lack of understanding on how to backyard compost;

²³ Ali Artaman. *Windsor-Essex County Population Report 2009*. Windsor-Essex County Health Unit.

- Inconvenience of going out and purchasing a backyard composter;
- Concern over odours and pests;
- Belief that backyard is too small; and
- Perception that composting is messy, among others²⁴.

To counter these barriers, the Township developed a webpage hosting composting videos and other information about backyard composting, sold subsidized backyard composters for \$35 and aerators (which are not commonly available in garden centres or similar stores) for \$15, and offered vermicomposting (i.e., composting with worms) workshops and garden parties (www.tol.ca/CurrentNewsInitiatives/Initiatives/HomeComposting.aspx).

GRASSCYCLING

Grasscycling is the practice of leaving grass clippings on the lawn so they can decompose and return to the soil. Many municipalities do not accept or discourage collection of grass clippings because they can cause odour issues during the yard waste composting process. In Essex-Windsor, depending on the municipality, grass clippings may be collected with yard waste, but they are charged a tip fee if they are being dropped-off at the Windsor and Kingsville depots.

In addition to the promotion of grasscycling and the banning of grass clippings, another way of encouraging grasscycling is through rebates for mulching lawnmower blades or mowers. In many cases, residents submit a form (generally available online) to the EWSWA with the receipt for the mulching blade or mulching mower. Examples of American rebate programs are provided in Table 11.

²⁴ Lura Consulting. *Township of Langley Backyard Composting Community-Based Social Marketing Study*. November 1, 2010.

Table 11: Examples of Mulching Rebate Programs

Municipality	Type of Incentive
Glendale, CA	<ul style="list-style-type: none"> • Brush chipper/shredder - \$100 rebate (maximum of 15 chipper/shredder rebates are issued each year) • Mulching mower retrofit blade - \$5 rebate
City of Northglenn, CO	<ul style="list-style-type: none"> • \$5 rebate on utility bill on purchase of mulching lawnmower blade or new mulching lawnmower
Hastings Utilities, Hastings, NE	<ul style="list-style-type: none"> • New mulching blades are eligible for a \$10/blade rebate, limit three blades. • New mulching mowers are eligible for a \$50 rebate.
Hutchinson, MN	<ul style="list-style-type: none"> • During backyard composting program rollout, residents provided with five dollar rebate coupon and a free backyard composter for attending workshop on backyard composting and grasscycling.
La Verne, CA	<ul style="list-style-type: none"> • \$10 rebate for mulching mower blades and compost bins • \$25 rebate for chipper shredders. • Residents who purchase these items brought receipt or proof of purchase to City Hall for rebate. • Program first come/first served with a ceiling of \$2,000.
Woodland, CA	<ul style="list-style-type: none"> • Rebate to residents who purchase a mulching mower and/or chipper and/or compost bin. • Funding for the program limited. Receipt of a rebate depends on availability of funds when applications received. • Rebate is for \$100 per item, or if the item costs less than \$100, then rebate is for the purchase price of the item. Maximum amount for rebate is \$300.
King County, WA	<ul style="list-style-type: none"> • King County (Washington) Natural Lawn Care program in the late '90s featured a limited (19 households in a single neighbourhood) distribution of free mulching mowers as part of campaign.

Estimated Diversion and Cost

Backyard Composting

- Estimated diversion increase: 1% to 3% (1,500 - 4,600 tonnes)
- Estimated costs:
 - Free backyard composter for each home: \$45 per composter x 46,000 homes = \$2,070,000; or
 - Subsidy of backyard composters: included in EWSWA's existing budget
 - Supporting promotion and education: \$5,000 - \$10,000

Grasscycling

- Estimated diversion increase: 1% (1,500 tonnes)
- Estimated costs: \$2,000 for rebate ceiling

Recommendations

BACKYARD COMPOSTING

It is recommended that the EWSWA continue with its practice of making subsidized backyard composters available to residents. The EWSWA should assess making a limited amount of backyard composters available for free, possibly tied in with a waste diversion education activity or as an incentive for participation in waste diversion programs. This program is recommended because it:

- Provides Essex-Windsor with a cost effective program to increase its waste diversion rate;
- Increases the amount of waste managed at the household, thereby reducing the amount of waste requiring collection and disposal;
- Encourages other activities (e.g., gardening) that are beneficial for individuals and society;
- Reduces the amount of organics entering the landfill, thereby reducing environmental management risks associated with landfilling organic material; and
- Is an option that is appreciated by the public, particularly those with an interest in backyard composting and waste diversion.

GRASSCYCLING

While grasscycling should continue to be encouraged, rebates for mulching equipment are not recommended at this time due to its low diversion potential.

6.8 Enhanced Collection of Recycling (Larger Blue Bin Recommended)

According to a recent study by EWSWA, approximately 72% of households participate in the area's recycling program. A potential barrier households may encounter in the EWSWA's recycling program is insufficient storage space for recyclables. This could include either space within the recycling boxes themselves or space to store the additional boxes they may need for recyclables. As recycling bins become full, some residents may opt to place excess recyclables in the garbage rather than use additional recycling bins. This could potentially become a greater issue if the EWSWA adds additional materials to its blue box collection (e.g., mixed plastics – see discussion in Section 6.8).

According to the 2011 waste audit commissioned by the EWSWA, the average blue box in Essex-Windsor is already over 90% full when placed out. While the EWSWA distributed new **red** boxes to residents in 2002 for the collection of paper products only, it has not provided free **blue** boxes to its residents since the inception of the recycling program in 1988. A potential means by which to increase a resident's container capacity is to appeal to the Continuous Improvement Fund (CIF) to subsidize the cost of new blue boxes for Essex-Windsor. The CIF is an agency created by the WDO to assist municipalities in improving diversion. The CIF has already committed to partially subsidizing new blue boxes for Essex-Windsor at a 50% level, but a condition of that funding is that Essex-Windsor add mixed plastics to the list of materials that residents can place in their blue box. **The new blue box would be a larger 22 U.S. gallon box compared to the current 16 gallon box being used for containers.** The cost to acquire 130,000 new blue boxes could be covered in part by CIF funding with the balance to be covered by a proposed contribution from EWSWA reserves. The EWSWA reserve contribution has yet to be approved by the Board. The total estimated cost would be \$850,000, which would include:

- \$620,000 - Cost for 130,000 blue boxes
- \$130,000 - Cost to distribute to each household @ \$1 per household
- \$100,000 - Cost to advertise and promote the addition of mixed plastics

Sources of funding totalling \$850,000 for this initiative could include:

- \$310,000 - CIF funding for cost of boxes
- \$310,000 - EWSWA for cost of boxes (yet to be approved by EWSWA Board)
- \$130,000 - CIF funding for distribution of blue boxes
- \$100,000 - CIF funding for advertising and promotion costs

In a pilot test in 2008, the EWSWA did examine the possibility of using carts to collect recyclables, but the study found that collection time increased by about three times and that a 15-20% increase in the amount of materials collected would be required to make the carts feasible. Due to the outcome of the study, the EWSWA is not looking to proceed with cart collection.

Another option would be weekly collection of recyclables, which would also improve the overall convenience of the recycling program, as residents would be able to set out their recyclables more often.

To assess the collection costs for this option, the EWSWA could specify larger bins and/or include weekly collection as an option in the recycling collection tender. Table 12 presents sample per tonne collection costs for selected Ontario municipalities, as well as the average amount of recyclables marketed per household

Table 12: Collection Frequency of Recycling

	Average kg of recyclables marketed per HHD per year	Residential Collection Costs Per Tonne
Dual Stream/Alternating Weeks (e.g., fibres collected one week, containers the next)		
Niagara Region	217	\$148
Ottawa (City)	171	\$186
Average	194	\$167
Dual Stream/Bi-Weekly (e.g., fibres and containers collected every two weeks)		
EWSWA	158	\$142
Sarnia	95	\$175
Chatham-Kent	95	\$164
Oxford County	163	\$182
Average	128	\$166
Dual Stream/Weekly (e.g., fibres and containers collected every week)		
London	157	\$185
Hamilton	195	\$183
Durham Region	221	\$187
Region of Waterloo	183	\$191
Simcoe County	180	\$230
Brantford	165	\$256
Norfolk County	150	\$290
Average	179	\$217
Single Stream/Weekly (e.g., fibres and containers collected every week in single bin)		
Halton Region	243	\$109
Toronto	164	\$213
York Region	254	\$111
Peel Region	229	\$200
Guelph	166	\$159
Average	211	\$158

Estimated Diversion and Cost

Larger Blue Bins

- Estimated diversion increase: 2% to 4% (3,100 to 6,200 tonnes)
- Estimated costs: \$850,000, with \$540,000 to potentially be covered with CIF funding

Weekly Collection of Recyclables

- Estimated diversion increase (moving to weekly collection): 2% to 3% (3,100 to 4,600 tonnes)
- Estimated costs: to be determined through tender process

Recommendations

LARGER BLUE BINS (22 US GALLON / 83 LITRE)

It is recommended that the EWSWA proceed with planning the purchase of larger blue bins for distribution to Essex-Windsor households, as:

- The larger bins will allow households to place more materials in their blue bin, thereby reducing the amount of blue bin overflow that is placed into the garbage;
- Households will need containers larger than the 60 litre (16 US gallon) blue boxes currently distributed, if mixed plastics or other materials are introduced into the blue box program;
- It is expected that households will appreciate receiving a larger blue box with no out-of-pocket expense from them; and
- Funding for larger blue boxes is available from the Continuous Improvement Fund, which will increase the cost-effectiveness of the option.

WEEKLY COLLECTION OF RECYCLABLES (NOT RECOMMENDED FOR IMMEDIATE IMPLEMENTATION)

It is recommended that the EWSWA continue with its practice of instructing bidders to provide pricing for weekly and bi-weekly collection of recyclables in its collection tender²⁵, as:

- It will allow the EWSWA to assess the cost-effectiveness of providing weekly recyclables collection; and
- While weekly collection is more expensive, it has been demonstrated to provide increased diversion.

6.9 Expanding Acceptable Materials in Existing Programs (Recommending to Add Mixed Plastics)

Expanding the amount of materials accepted in a recycling program is one way for Essex-Windsor to divert more materials, but this is contingent on being able to properly process and find markets for these materials. Currently, the Essex-Windsor municipalities accept all mandatory recycling materials (as defined by WDO) and all expanded recycling program materials except mixed plastics, polystyrene packaging, Styrofoam and plastic film. If these materials are included in recycling programs, Essex-Windsor's waste diversion rate could increase by nearly 4 percentage points.

Adding Mixed Plastics (e.g., plastic trays and clamshell containers) to Blue Box Program (Recommended)

Currently, the blue box program in Essex-Windsor collects the following plastics for recycling:

- PET bottles (pop, water etc.);
- Narrow neck plastic bottles (detergent, shampoo, ketchup, etc.); and
- Tubs and lids (margarine, yogurt, etc.).

²⁵ Next recycling collection tender occurs in 2016

Mixed Plastics constitutes all the other plastics except for plastic bags, styrofoam packaging, and non-food grade plastics such as ABS (piping), fibreglass, and polycarbonates (e.g., the plastics used to make electronics, DVD's, plastic lenses, etc). Examples of mixed plastics include plastic trays, clamshells, and non-bottle containers. According to the 2011 waste audit, these mixed plastics constitute about 16 kilograms/household/year of materials, or about 3,100 tonnes annually (2% of the entire waste stream). The actual amount of mixed plastics that would be collected curbside would be less than this figure, since approximately 75% of Essex-Windsor households actually set out recyclables for collection. Those households may then only put 80% of their mixed plastics in their blue box. Although mixed plastics are not part of the current blue box program, there are approximately 360 tonnes per year that are being processed through the recycling centre. The potential amount of additional mixed plastics that could be recovered is approximately 1,400 tonnes, which would increase the current waste diversion rate by 1 percentage point.

Unlike styrofoam and plastic bags, the addition of mixed plastics can be managed easily within Essex-Windsor's existing Material Recovery Facility (MRF) by providing one additional sorter. This sorter will not only remove mixed plastics but also be responsible for removing more of the other recyclable materials. This will increase diversion and further reduce the residual levels at the container MRF. There will be no increase in cost for curbside collection. Additional operating costs will include cost for one additional staff at the container MRF for sorting (est. \$44,000), which could be offset by the revenues from sale of the recovered mixed plastics (approximately \$56,000, assuming a sale price of \$40/tonne).

Polystyrene (e.g., Styrofoam) (Recommended Pilot Testing)

Even though polystyrene (including expanded polystyrene foam, or EPS) only accounts for less than 1% of the total waste stream (about 400 tonnes), it takes up considerable volume compared to its weight. This added volume can affect costs by requiring more space for storage and vehicle trips for shipping. These issues can be addressed in part if the polystyrene is compacted.

The Town of Markham recently finished a pilot study on polystyrene compaction and recycling and found it could reduce volumes by 90% using a small polystyrene densifier. Densification of EPS involves the use of heat to cause the molecular polymer chains of EPS to retract from their expanded, foamed positions, resulting in a mass reduction of 90:1. The average compression ratio of EPS in a conventional fibre/plastic baler is 15:1. The use of an EPS densifier can yield the following benefits:

- Lower transportation costs to market;
- Enhanced value and broader market for densified material; and
- Elimination of baling EPS, freeing up baling equipment for higher volume materials.

After a three month trial, the Town of Markham found that there would be savings of \$1,160 per month if they compacted the EPS rather than shipping it loose, based on collecting 0.9 – 1.8 tonnes per week. Additional secondary financial benefits include reducing transport costs between recycling depots and eliminating labour hours needed to load and unload trailers every week and sometimes twice a week. The results are summarized in table 13.

Table 13: Cost Findings from Markham Study on Polystyrene Densification

(based on 5.5 tonnes of Expanded Polystyrene Foam (EPS))

Cost Category	Monthly Operating Costs (Loose)	Monthly Operating Costs (Using Densifier)
Energy Use	-	\$40
Maintenance	-	\$200
Labour	-	\$600
Lease of Densifier	-	\$2,200
Freight	\$3,600	\$0 (free freight if densified)
Shipping Bags	\$380	-
Total Monthly Costs	\$3,980	\$3,040
Revenue from Sale of Material	\$0	\$220
Net Monthly Cost	\$3,980 (or \$796/tonne)	\$2,820 (or \$513/tonne)

Once densified, Markham's material could then be sent to specific polystyrene processing and recycling facilities such as Polyframe Moulding Inc. (PMI) in Port Hope, Ontario. According to communications with management at PMI, the company accepts all loose polystyrene material (identified as the #6 recycling symbol) free of charge (except freight) and provides free freight if the polystyrene is densified²⁶.

Collection of polystyrene is not common among Ontario municipalities. Table 14 presents a selected list of municipalities that collect polystyrene, their method of collection, and tonnage collected. Of those listed that do collect it, the Town of Markham and another location in York Region do not accept polystyrene in their curbside collection program but instead at a local recycling centre. This process helps eliminate contamination of the polystyrene stream.

Table 14: Programs with Polystyrene Recycling

Municipality	Polystyrene Foam(#6)	Polystyrene Crystal(#6)	Tonnes Marketed	Method of Collection
Large Urban				
Toronto	X		47.67	Blue box
York Region	X		-	Depot (pilot)
Markham (part of York Region)	X	X	NA	Depot only
Hamilton	X	X	9.26	Blue box
Peel Region	X	X	31.08	Blue box
Urban Regional				
EWSWA			-	-
Niagara Region	X	X	4.04	Blue Box
Rural Regional				
Norfolk County	X	X	18.53	Blue box
Oxford County		X	12.41	Blue box

²⁶ This may depend on the distance between PMI and the municipality wishing to ship their EPS.

Plastic Film (e.g. grocery bags) (Recommended Pilot Testing)

Like polystyrene, plastic film (e.g., plastic grocery or shopping bags) is not widely collected in municipal blue box programs. The bags can lead to problems during processing, such as becoming tangled in machinery or contributing to contamination. Plastic film also has a low market value. For example, in 2010, the average monthly market value for plastic film ranged from \$18 per tonne to \$32 per tonne²⁷.

To help reduce these processing issues and improve market value for plastic film, the Canadian Plastics Industry Association (CPIA) developed a Best Practices Guide for plastic film recycling. It suggests that residents place these materials in a separate bag and set it near or in the recycling bin during collection days (so that it is not confused with regular garbage). During collection, haulers should squeeze the bag bundles to determine the presence of anything rigid or other contaminant. CPIA then recommends that the hauler place the plastic film in a separate, larger, plastic bag attached to the truck or in a side compartment of the truck. Once this larger bag is filled, CPIA suggests that it be placed within the fibres compartment of the recycling truck, as the fibre compartment provides better compaction of plastic film and the plastic bag bundles would be easy to spot once the truck fibre compartment is emptied. Once delivered to the MRF, workers should separate the bags from the fibre materials and bale or place the bags in a separate pile for recycling.

As Table 15 shows, municipalities that accept plastic film in their blue box request that residents place the bags inside a tied single bag. Other municipalities avoid collecting through their blue box program altogether. To avoid the cost of processing it (the City of Guelph estimated that adding plastic film to its current recycling stream would cost approximately \$135 per tonne²⁸), municipalities encourage retailers such as grocery stores to establish bins for accepting plastic bags at their retail outlets. Promotion templates are available. For example, figure 11 shows a poster prepared by CPIA and provided by the Region of Durham. Similarly, plastic bags could also be collected via municipal depots.

As an alternative to plastic film recycling, the EWSWA could consider adopting a plastic bag ban in order to limit the amount of plastic film entering its waste stream.

Table 15: Programs with Plastic Film Recycling

Municipality	Tonnes Marketed	Method
Large Urban		
Toronto	38.57	Blue bin (stuff in single bag)
Hamilton	533.94	Container blue box (stuff in single bag)
Peel Region	716.46	Blue box (stuff in single bag)
Urban Regional		
Region of Waterloo	na	Fibres blue box (stuff in single bag)
Niagara Region	207.51	Fibres blue box (stuff in single bag)
Rural Regional		
Norfolk County	24.22	Blue box
Bluewater Recycling	37.69	Blue box (stuff in single bag)
Oxford County	51.62	Container blue box

²⁷ StewardEdge. *The Price Sheet: Ontario Market Price Trends for January 2012*. 2012.

²⁸ City of Guelph. *2008 City of Guelph Solid Waste Management Master Plan: Appendix D – Additional Material Cost-Benefit Analysis*. 2008.

Figure 11: Sample Plastics Bag Recycling Poster



Estimated Diversion and Cost

MIXED PLASTICS

- Estimated diversion increase: about 1% (1,400 tonnes)
- Estimated costs: \$44,000, to be offset by revenues from sale of recyclables

POLYSTYRENE

- Estimated diversion increase: less than 1% (about 320 tonnes, based on 75% capture rate)
- Estimated costs: \$163,000 (using densification) - \$229,000 (without densification)

PLASTIC FILM

- Estimated diversion increase: 2.5% (or 3,800 tonnes)
- Estimated costs: If collected at retail, included in promotion and educations

Recommendations

MIXED PLASTICS (BAKERY AND PRODUCE CLAMSHELLS)

It is recommended that the EWSWA introduce mixed plastics into the blue box recycling program because:

- It will increase the EWSWA's waste diversion rate;
- While there will be a cost for an additional sorter at the Material Recycling Facility, there is an opportunity for revenues to offset some or all of the additional cost and generate revenue;
- It will increase the level of service provided to residents, who have asked for the ability to recycle more materials; and
- It may make sorting of plastics easier for residents.

POLYSTYRENE (STYROFOAM)

It is recommended that the EWSWA pilot test accepting polystyrene (Styrofoam) at its recycling depots and promote the opportunity, as it will:

- Raise service levels for residents by providing them with an opportunity to recycle this material;
- Potentially increase the efficiency and effectiveness of the EWSWA's blue box program by keeping polystyrene out of the blue box stream;
- Help measure the cost-effectiveness of recycling polystyrene in Essex-Windsor and whether a densifier is warranted; and
- Help to confirm the amount of polystyrene waste available for recycling.

PLASTIC FILM (GROCERY BAGS)

It is recommended that the EWSWA pilot test accepting plastic film (e.g., plastic film) at its recycling depots, engage local retailers to establish a local plastic bag take-back bin at their outlets, and promote these opportunities to residents. This recommendation is being put forward because it will:

- Help raise Essex-Windsor's waste diversion rate;
- Help measure the cost-effectiveness of accepting plastic film at the EWSWA's recycling depots;
- Increase the level of service to residents by providing them with an opportunity to recycle this material; and
- Potentially increase the efficiency and effectiveness of the EWSWA's blue box program by keeping plastic film out of the blue box stream.

6.10 Establishment of Satellite Depots and Reuse Centres

Satellite Depots (Recommended to Assess the Feasibility)

Currently, Essex-Windsor has two depot locations where residents can drop off recyclable items as well as other items for diversion and disposal. The two sites service an area approximately 54 km by 33 km. Satellite depots could be established for non-hazardous recyclables in outlying areas of Essex-Windsor. This would shorten distances residents need to commute in order to drop off

recyclables. The depots would provide residents with an opportunity to get rid of excess recyclables if their bins are full, and the depots could also be used to accept materials problematic when accepted at curbside, such as mixed plastics, polystyrene, or plastic film. In addition, the extra bins would increase the presence of the recycling program and make it more visible for residents. They should be placed in high traffic areas, such as the main street of municipalities within the region or near grocery stores. The cost associated with establishing satellite depots would be about \$5,000 to \$10,000 per site (assumes depots would be located on municipal property).

Depot best practices should be followed when designing the depot systems, including those described in the following documents:

- Phase 2 of Rural Depot Project: Best Practices of Rural Recycling Depot Programs by Quinte Waste Solutions (Phase 2 of Stewardship Ontario E & E Funded Project Number 45).
- Best Practices Guide for Depot Collection of Polystyrene Cushion Packaging by Environment Plastics Industry Council and Grace Canada Inc. July 2008.

Reuse Centres (Recommended that Partnerships be Explored)

Providing Reuse Centres at strategic locations throughout the region would increase awareness of diversion programs and reinforce beneficial attitudes toward waste reuse. The centres could also be used to promote other diversion programs through signage, provide contact information and hours of operation.

One option would be to build municipal reuse centres (possibly on currently owned municipal land) or use existing municipal buildings and space. Based on the intended purpose, available space and design, costs could range between \$2 and \$7 million with annual operating costs of \$1 to \$3 million²⁹.

Alternatively, the EWSWA could form partnerships with either charitable organizations or not-for-profits. A number of municipalities across North America operate or sanction re-use centres for diversion. Examples of such centres include:

- Whistler, BC: The ReUse It Centre was built by the Resort Municipality of Whistler and is operated by the Whistler Community Services Society (WCSS). Items are donated and resold at low prices with proceeds supporting ongoing WCSS programs such as the food bank.
- City of Kawartha Lakes, ON: A reuse centre was built at their waste management site in an effort to divert waste from disposal in their landfill. The Reuse Centre accepts donations of used items, which are then re-sold for a nominal fee.
- Burlington, ON: Burlington's The Reuse Centre is operated by The Burlington Reuse Environmental Group, which is a not-for-profit charitable organization. The purpose of the Reuse Centre is to make items that would normally be put in the garbage are instead available for use by others. Residents drop off items in at an area behind the building, which are then sorted and placed in appropriate areas where they can be sold to others for reuse.
- Edmonton, AB: The Reuse Centre in Edmonton accepts various items from Edmonton residents free of charge and makes them available to organizations and individuals for reuse.

Impacts on diversion are relatively small compared to other options. Based on other municipalities across Ontario, diversion increases by 1% per reuse centre (or about 1,500 tonnes).

²⁹ GENIVAR Inc. *Current State and Diversion Options Draft Interim Report: Halton Region*. April 2011.

Estimated Diversion and Cost

SATELLITE DEPOTS

- Estimated diversion increase: 1% - 2% (1,500 – 3,100 tonnes)
- Estimated costs: \$5,000 to \$10,000 per depot

REUSE CENTRES

- Estimated diversion increase: 1% (1,500 tonnes)
- Estimated costs: 1\$ to \$3 Million per year to operate own facility; if partnership, costs to be determined by nature of partnership

Recommendations

SATELLITE DEPOTS

It is recommended that the EWSWA assess the feasibility of establishing waste diversion depots in strategic locations across the County as a means to provide greater convenience and increased participation. The assessment should include (but not be limited to):

- Preferred strategic locations, from both an operations perspective and a customer service perspective;
- The types of materials that would be accepted at the depots;
- Whether the depots would be staffed;
- Estimated increase in waste diversion; and
- Anticipated costs.

This recommendation is being put forward because:

- It would provide another opportunity where residents can take their overflow blue box materials and other divertible materials that may not otherwise be collected curbside (depending on what is accepted at the depots); and
- It is a potentially cost-effective way to raise the level of service provided to the residents of Essex-Windsor.

REUSE CENTRES

It is recommended that EWSWA explore potential partnerships with charitable organizations to construct, operate or otherwise facilitate a reuse centre.

This recommendation is being put forth because:

- There is the potential for added diversion from this option;
- In addition to diverting waste from disposal, reuse centres help to fulfill a community need for low-price household goods;
- Such a partnership would likely be more cost effective than having EWSWA establish a reuse centre on its own and would help support local charity;

- EWSWA would be able to build upon the reuse activities by promoting other opportunities for waste reuse (e.g., thrift stores, existing reuse organizations, reuse online networks such as freecycle and Craigslist).

6.11 Mandatory Recycling (Recommended)

Mandatory recycling is a municipal tool to ensure that residents participate in recycling (or other diversion) programs. Mandatory recycling is implemented and enforced through application of a municipal by-law that either:

- Bans recyclable and other materials from disposal in the landfill;
- Prohibits recyclable materials from being placed in the garbage; or
- Both.

The by-law could also specify that all households are provided with recycling containers and are not allowed to opt out.

For example:

- Pictou County, Nova Scotia provides a list of materials in its Solid Waste-Resource Management Bylaw (Clause 3.3) that “no person shall dispose of ... in any landfill or incinerator;”
- The Township of East Luther Grand Valley states in its garbage by-law (Clause 6a) that “it is the responsibility of waste generators to ensure that all recyclables and organic material is removed from the Household waste stream prior to placing at the curb for collection;” and
- Section 1903 of the San Francisco Mandatory Recycling and Composting Ordinance requires that “all persons in San Francisco must source separate their refuse into recyclables, compostables and trash, and place each type of refuse in a separate container designated for disposal of that type of refuse. No person may mix recyclables, compostables or trash, or deposit refuse of one type in a collection container designated for another type of refuse...”

For a mandatory recycling approach to be most effective in Essex-Windsor, each municipality would need to implement measures similar to the other municipalities. For example, updates to bylaws should be the same for each participating municipality to ensure consistent messaging.

If this option were to be pursued, the way in which it would be used or enforced would need to be explored further by the EWSWA and its municipal partners and would depend on the needs of the community. For example, a moderate approach to mandatory recycling would see it as a promotion and communications tool, to be enforced only when absolutely necessary (e.g., a household that places large amounts of waste at the curb each week with no attempt at diversion). A more aggressive approach could have haulers checking garbage bags they suspect of containing recyclables and rejecting those bags that do.

There is mixed information on the effectiveness of mandatory recycling. While the research indicates that mandatory recycling programs have higher participation rates, it is unclear if they lead to increased amounts of material recycled. In other words, those who will not recycle unless they are forced to still will not recycle very much.

A key concern the public often has regarding mandatory recycling is the perception that bylaw officers or haulers will be routinely going through their garbage for recyclables, which many feel is an invasion of privacy. However, as noted above, municipalities with mandatory recycling bylaws can use the

bylaws selectively, whether in conjunction with education or exclusively with households that persist in not recycling. Those who make efforts to recycle (as evidenced by blue/red boxes at the curb) would not be likely targets of bylaw enforcement activity.

In addition to specific set out procedures, this option would require some additional enforcement by by-law officers and could require additional staff and training. Increasing promotion and education to residents is also an essential part of implementing this option. Costs for this option would be dependent on the level of enforcement required.

Table 16: Ontario Municipalities with Mandatory Recycling

<ul style="list-style-type: none">• City of Guelph• Region of Halton• Township of Amaranth• Township of East Luther Grand Valley• Township of Edwardsburgh Cardinal• Township of Galway-Cavendish and Harvey• Municipality of Algonquin Highlands• Municipality of Dysart	<ul style="list-style-type: none">• Municipality of Highlands East• Municipality of Huron East• Township of Algonquin Highlands• Township of Minden Hills• Township of Rideau Lakes• Township of Wollaston• Village of Lucknow
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Estimated Diversion and Cost

- Estimated diversion increase: Approximately 2% (3,100 tonnes), or more if used in conjunction with clear bags.
- Estimated costs: to be determined with level of enforcement required.

Recommendation

It is recommended that the EWSWA propose that the Essex-Windsor municipalities and the EWSWA collectively discuss the feasibility of introducing mandatory recycling in Essex-Windsor. This discussion should include (but not be limited to):

- Whether mandatory recycling is introduced in a new or existing municipal by-law;
- The purpose of mandatory recycling in Essex-Windsor and how it would be used (e.g., as an educational tool, degree of enforcement, etc);
- What constitutes “recycling” (e.g., a certain number of blue box set-outs during a period of time, blue box materials prohibited from being placed in the garbage, etc);
- The level of enforcement (e.g., passive or active enforcement, use of fines or refusal of garbage collection service, etc);
- Examples of how mandatory recycling has been implemented in other municipalities, including wording used in other by-laws or policies; and
- The need for it to be consistent across all Essex-Windsor municipalities.

This recommendation is put forth because:

- Mandatory recycling provides additional credence to educational activities;
- It provides municipalities with a legislative backdrop against which other programs can be implemented;

- It provides municipalities with the means to address excessive waste disposal behaviours or absent waste diversion practices; and
- Municipalities have the flexibility to enforce a mandatory by-law as much or as little as they want, depending on what is required and the intent of the by-law.

6.12 Enforcement of Material Bans (Not Recommended)

Essex-Windsor has already adopted municipal by-laws prohibiting yard waste materials from entering the disposal stream and therefore could consider banning other materials, such as recyclables and municipal hazardous and special waste, to encourage residents to use diversion programs. A gradual, incremental process to implementation (warning first, small fine on second infraction, and progressively larger fines for additional infractions) could help to make the transition easier for residents.

Enforcing current by-laws and regulations more stringently and hiring additional personnel for enforcement is a viable option to increase diversion rates without changing current, well established diversion programs.

Estimated Diversion and Cost

- Estimated diversion increase: Approximately 2% to 3% (3,100 – 4,600 tonnes).
- Estimated costs: to be determined with level of enforcement required; would also include additional promotion and education.

Recommendation

This option is not recommended at this time, in favour of the mandatory recycling option, which would likely be easier to enforce and encourages correct separation of wastes at the source.

6.13 Promotion and Education (Recommended)

Public engagement is an ongoing dialogue with a community to identify and remove barriers to participation and maximize program effectiveness, efficiency and economics. Preferably, public engagement begins at the time that the municipality is first considering a new waste management program, so that the input of the customers can be knitted into the design of the system. As well, as systems expand and change, community engagement provides feedback on existing programs and guidance on new ones. Waste diversion programs can fail or succeed based on their ability to overcome public barriers to participation, so public engagement is crucial. Well-designed programs can fail for lack of public engagement, while poor programs can be made more effective on the strength of good public engagement. Effective public engagement strategies include:

- Meaningful two-way dialogue between the system managers and their customers to identify barriers and opportunities to overcome them;
- Development of an effective and convenient system with an integrated communications program based not only on awareness but on behaviour change; and,
- Testing and fine-tuning the methods, messages and techniques.

The EWSWA currently has a broad promotion and education program that makes use of a wide range of materials and mediums, including collection calendars, fridge magnets, composting booklets,

television ads, radio ads, posters, displays at public events, presentations in schools, among other things. The materials cover a variety of diversion topics, including waste reduction and reuse, recycling and composting. This has helped the EWSWA divert nearly 18% of its total waste stream through the blue box program in 2010. This is below the average of about 21% for its WDO municipal grouping.

Two opportunities for increasing Essex-Windsor's waste diversion rate are to:

- Investigate and identify the barriers to participation in the area's waste diversion programs; and;
- Design and implement a Community-Based Social Marketing campaign to overcome the barriers and increase diversion.

6.13.1 Identification of Possible Barriers

A key step toward the strategic improvement of a municipality's waste diversion rate is the identification of barriers to participation. In 2008, the United Kingdom's Waste & Resources Action Programme (WRAP) conducted a study to examine barriers to recycling at home and identify ways the barriers could be overcome³⁰. The study organized the barriers identified into four categories:

- **Situational barriers**, where recyclers would recycle more if they had:
 - Collections of a wider range of materials;
 - Bigger containers;
 - More containers;
 - More space to store their containers;
 - More frequent collections;
 - If the containers were easier to move.
- **Behaviour Barriers**, where current recyclers occasionally:
 - Put materials in the garbage if they are unsure of where it goes;
 - Throw recyclable bathroom wastes in the garbage;
 - Put things in recycling even if they are unsure of it can be recycled;
 - Forget to put recyclables out on collection day;
 - Put recyclables in the garbage when their recycling containers are full;
 - Put recyclables in the garbage rather than clean them for recycling;
 - Are discouraged due to identify theft concerns;
 - Are discouraged by having to store recycles or clean them.
- **Lack of knowledge or understanding:**
 - Lack of understanding on their municipality's recycling program;
 - Lack of understanding on the real benefits of recycling;
 - Not knowing what can or cannot be recycled;
 - Knowing or remembering when their collection dates are.
- **Attitudes and Motivators**, where recyclers would be encouraged to recycle more if they:
 - Saw the practical impact of recycling in their local area;
 - Felt their efforts were more appreciated by the local municipal council;
 - Received an incentive for recycling;
 - Were fined for not recycling.

³⁰ Pocock et al. *Barriers to Recycling at Home*. WRAP. August 2008.

All of the barriers listed above could potentially be affecting Essex-Windsor's waste diversion rate. Methods for identifying which barriers are specific to Essex-Windsor include:

- A survey of randomly selected residents (e.g., a telephone or door-to-door survey);
- Questionnaires administered at kiosks placed at public events or in public spaces (such as a mall or grocery store); or
- An online survey.

6.13.2 Community-Based Social Marketing (Recommended)

Community-based social marketing (CBSM) is an approach to behaviour change that draws heavily upon research in social psychology that shows that efforts to promote behaviour change are most effective when they are carried out at a community level and involve direct contact with people. CBSM acknowledges that while awareness and knowledge is important, it alone is insufficient to ensure the desired behaviour change. For example, it is widely understood that smoking and fast food are poor health choices, yet many people still smoke and eat fast food.

CBSM takes a pragmatic, stepped approach to fostering behaviour change. It includes:

- Market research, such as identifying target audiences as well as barriers to desired behaviours;
- Developing approaches and supporting materials to overcome these barriers;
- Implementing the program, with set goals, objectives and monitoring of the results; and
- Evaluating and fine-tuning the approach or program.

CBSM also uses tools that have been identified as being particularly effective in fostering change. Although each of these tools on its own is capable of promoting sustainable behaviour, the tools can often be particularly effective when used together. Key community-based social marketing tools include:

- Prompts (e.g., items that remind people to engage in waste diversion, such as the EWSWA's fridge magnets);
- Commitments, where residents commit or pledge to adopt a sustainable behaviour (e.g., signing a pledge card to recycle something every day);
- Social or community norms (for example, the visual of a street lined with recycling boxes, indicating that recycling is the right thing to do and everyone is doing it); and
- Vivid and engaging communications tools.

Estimated Diversion and Cost

- Estimated diversion increase: about 1% to 4% (1,500 to 6,200 tonnes) based on existing programs.
- Estimated costs: \$10,000 for CBSM campaign

Recommendations

It is recommended that the EWSWA continue with its qualitative and quantitative research on barriers to recycling and other waste diversion programs in order to better understand how residents recycle,

their barriers and motivation for participating in the waste diversion activities, and how to overcome the barriers.

It is also recommended that the EWSWA develop a Community-based Social Marketing campaign to address the barriers identified in the market research. Based on the barrier research, incentives may form part of the Community-based Social Marketing campaign.

These recommendations are put forward because:

- Promotion and education is a best practice;
- It is one of the most cost-effective ways of increasing participation in waste diversion programs and increasing the amount of waste diverted;
- Increased promotion and education is an option well supported by residents;
- Without sustained promotion and education, waste diversion programs will not work optimally (i.e., participation will drop off, or residents will participate incorrectly, which increases processing costs).

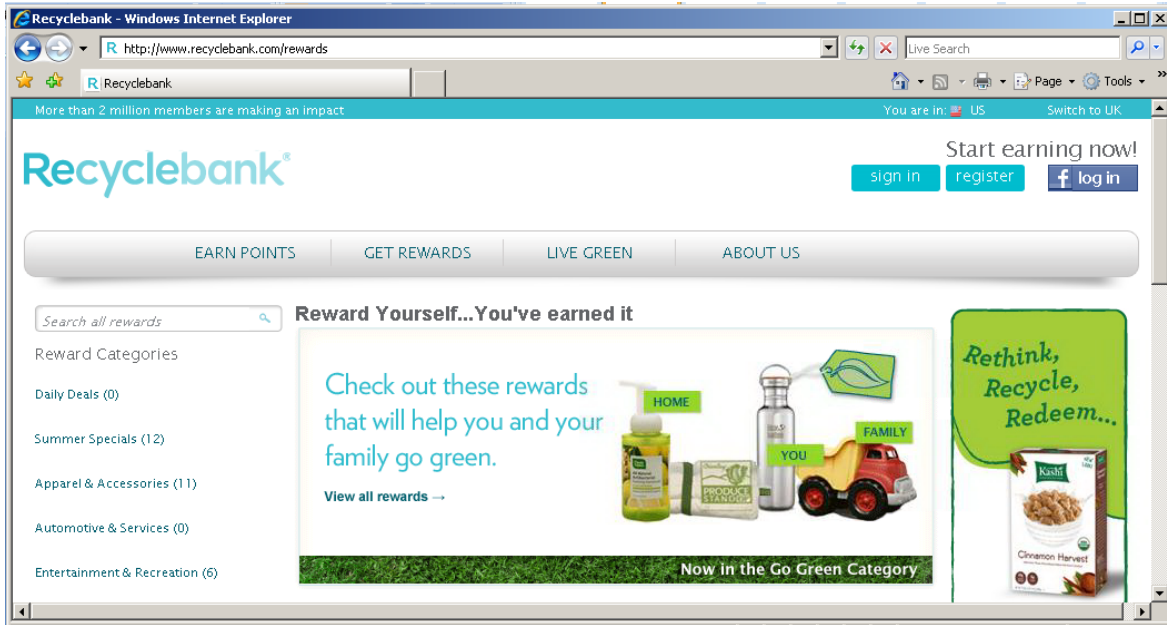
6.14 Incentives and Recognition for Good Diversion Behaviour (Not Recommended)

Another option for encouraging residents to increase diversion is through incentive programs. One such program is Hamilton's "Gold Box" program. Residents can be nominated or nominate themselves as being model citizens at waste diversion. City staff then come by unannounced during a collection day to conduct a curbside audit of their waste. Households who have most of their waste in their blue boxes and green cart are awarded a gold recycling box. By using the Gold Box, they are helping to demonstrate their willingness to recycle, emphasize that diverting most of their waste is achievable and can be part of the social norm, and motivating others to recycle more as well.



Other incentives could include rewards such as providing credits (e.g., www.recyclebank.com³¹), free bins, tax incentives or compost giveaways to motivate residents to achieve greater diversion. For example, the City of Windsor, England recently started a recycling rewards points system where residents were granted points based on the amount (weighed in kilograms) of recyclables set out every collection period. The more recyclable materials residents put out at the curb, the more rewards points were given. These points could then be used at local businesses or donated to their local schools or charities. It is reported that residents who participated in the program increased their recycling by 35%.

³¹ Recyclebank.com is noted as an example of a type of incentive program. Typically, recyclebank.com is not used in dual-stream recycling programs.



According to the recyclebank website (www.recyclebank.com/faq/index/category/url/home-recycling-us), there are different ways for cities to participate in the Recyclebank program. In some areas, Recyclebank uses technology (on trucks and on recycling carts) to determine how much households recycle. Carts are weighed each week when recycling is picked up, and the weight of the cart contents is converted into a number of Recyclebank Points that the household can redeem for rewards. In other communities, similar technology on trucks and/or recycling carts determine who participated in recycling and then collects the total weight of the recyclables collected in a neighbourhood (or a recycling pick-up route). In these communities, individual households that recycled earn points based on an equal percentage of the total neighbourhood recycling weight. The third approach requires participants to report their recycling practices to Recyclebank (via their website or a mobile app) in order obtain their Recyclebank Points.

Estimated Diversion and Cost

- Estimated diversion increase: Approximately 1% to 3% (1,500 – 4,600 tonnes).
- Estimated costs: To be determined, depending on type of incentive program implemented. For example, the estimated capital costs for Windsor, England's "Recyclebank" rewards points system were \$1,000,000 - \$2,000,000 for new bins, retrofitting trucks, and creating accounts for each participating resident. Cost items may include cost of tax credits, compost giveaways, free bins, among other costs depending on the incentives.

Recommendation

An incentive program is not recommended for Essex-Windsor at this time, except for continuing with the practice of subsidized backyard composters.

6.15 Extended Producer Responsibility (Recommended)

Essex-Windsor could promote the integration of environmental costs into the market price of products. The region could also consider establishing and promoting retail “Take it Back” initiatives, where manufacturers and suppliers would be responsible for taking back products at the end of the life cycle. Essex-Windsor should also attempt a communication strategy to inform participants in the product chain, particularly retailers and manufacturers, on how to reduce product packaging and improving recycling where possible.

The effect on diversion rates is variable, as implementing an EPR program requires many agencies and institutions to work together. Given this, several effects have been noticed in Europe where this option is prominent: reduced quantities of packaging, lighter weight of packaging and total per-capita packaging consumption dropping three percent per year after implementation.³²

An example of a corporation that has taken steps to reduce its environmental footprint and increase diversion through extended producer responsibility is Wal-Mart, specifically its Bridgewater, Nova Scotia location. This store has reached a 98% diversion rate and has received Nova Scotia's Mobius Award for Environmental Business of the Year. The Bridgewater location has taken the following steps to increase diversion:

- Sorting stations installed throughout the store for staff and customers;
- Plastic crates are used instead of cardboard boxes;
- Recycling and diversion discussions are a regular part of morning staff meetings;
- Out of season clothing is donated to local charities instead of being disposed; and
- Full-time position was created to manage waste programs at the store.

These steps have enabled the store to reduce its refuse collection from one compactor per week to one every four months. Local businesses and institutions should be encouraged to follow these steps or similar ones in order to increase the amount of IC&I diversion.

Cost for implementing this option could be incorporated into Essex-Windsor's promotion and education program. In addition, staff time would be required to promote the program alongside educational material.

Estimated Diversion and Cost

- Estimated diversion increase: about 1% to 3% (1,500 to 4,600 tonnes), depending on the materials targeted by the stewardship programs.
- Estimated costs: to be included in existing senior staff activities. Likely to result in cost savings for municipalities as industry funds or assumes responsibility for materials (e.g., tires, electronics) or modifies materials (e.g., thin-walling of aluminum cans).

Recommendations

It is recommended that the EWSWA and local municipalities alike continue with efforts to lobby for increased Extended Producer Responsibility (EPR) because:

³²Solid Waste as a Resource. Guide for Sustainable Communities, 2004.

- It can be incorporated as part of staff or politicians regular duties with no additional capital expense; and
- It can ultimately result in reduced cost to the municipality for waste diversion programs as product stewards increase funding for programs or assume responsibility for specific waste materials (e.g., tires, electronics, alcohol containers, etc).

6.16 Adopting a Zero Waste Policy at Municipal Events and Providing Public Recycling Receptacles (Not Recommended)

This option would have to be used in conjunction with a dedicated organics diversion program. At community events and locations, Essex-Windsor could limit the amount of refuse accepted and display recycling and organics containers prominently. This option would set a good example for residents and businesses in Essex-Windsor and help them adopt a minimal waste attitude, which is essential for reaching any waste diversion goal.

A zero-waste policy could be established and enforced at municipal events and buildings, including:

- Libraries
- City hall
- Fire stations
- The Carrousel of the Nations
- Bluesfest
- Essex County Fairs

As an example of the potential effect on diversion, the Town of Markham started a “zero waste” policy at all municipal locations and installed 95 public recycling and organics receptacles at high traffic pedestrian area.

In total, Markham diverted the equivalent of six 14-yard bins of garbage per week at municipal buildings. Cleaning contracts were re-negotiated at municipal buildings to reduce garbage collection and as a result over 500 garbage containers were reduced to 25. The decrease in garbage containers resulted in an increase of recycling and organics receptacles. In addition, all food and catering services at the Town were required to use suppliers that shipped materials in recyclable products, offered biodegradable cups and plates, and supplied silverware. All eating areas were supplied with blue and green carts only.

Renegotiating collection services and cleaning contracts could result in savings for Essex-Windsor, with less material needing disposal at the landfill. New recycling and organics receptacles for community events, buildings and public areas ranged between \$150 and \$250 per station. Additional promotion and education would be required to ensure residents and businesses comply with the option.

Estimated Diversion and Cost

- Estimated diversion increase: 1% to 2% (1,500 to 3,100 tonnes)
- Estimated costs: \$1,000 - \$3,000 in receptacles and installation

Recommendation

This option is not recommended at this time, as it would require an organics program in place to be most effective.

6.17 Programs in Other Municipalities

In addition to the program options described above, there are other approaches that municipalities are using to drive waste diversion. These are noted in Table 17 for information.

Table 17: Additional Practices in Other Municipalities

Initiative/Practice	Municipalities
Promotion of Diaper Services Promotion of diaper cleaning services, to encourage residents to switch to reusables.	Halton Region, ON
Extruded Polystyrene Densification Using a special machine to densify extruded polystyrene (e.g., Styrofoam). Reduces volume of material and shipping costs.	Markham, ON
Weekly Collection of Recyclables in Blue Cart Instead of multiple blue bins, residents are provided with a cart for placing all of their recyclables for weekly collection, Requires single-stream MRF.	Toronto, ON
Promotion of Retailer Grocery Bag Take-Back Incorporate CPIA communication materials to promote how residents should take their plastic grocery bags to retailers (see figure 11).	Durham Region, ON
Pumpkin Composting Pumpkins are collected and composted with leaf and yard waste.	Calgary, AB
Community Curbside Free Garage Sale A special day is designated where residents can set reusable but unwanted materials at the curb for other residents to use. Material not collected could be picked by municipality on following day.	Brockville, ON Edmonton, ON
Construction and Demolition/Renovation Waste Residents drop off sorted construction and demolition or renovation wastes for reuse and recycling.	Halifax, NS Edmonton, AB
Community Waste Education Centre Space is provided at a municipal processing facility or other waste-related centre to deliver educational programming.	Hamilton, ON Colchester County, NS
Composting Champions/Master Composting Workshops Community “composting champions” and Master Composter workshops can teach residents to become better backyard composters.	Various municipalities in Nova Scotia Nanaimo, BC
Recycling of Agricultural Waste Recycling farm waste, in particular farm plastic waste, rather than disposing of in landfill or burning.	Delta, BC (pilot) Wisconsin
Promotion of Green Procurement Encourage both municipal departments and the general public to adopt green procurement practices, become a green consumer, or “precycle”.	Halifax, NS Stratford, ON
Election Sign Recycling Following elections, coroplast election signs can be dropped off at a depot location for recycling.	York Region, ON Edmonton, AB Peel Region, ON Toronto, ON

7 Public Consultation

While the public was able to provide feedback at any point during this planning process, there were three key points of engagement with stakeholders and the public:

- Interviews with key stakeholders;
- Posting of planning information on the EWSWA's website (the Options Brief); and
- A pair of public open houses to present and discuss potential waste management options.

Stakeholder Interviews

In the Fall of 2011, exp staff contacted and distributed a questionnaire to key stakeholders identified by the EWSWA. The interviews sought to identify key waste management issues within Essex-Windsor and opportunities for addressing them. Five interviews were completed.

The key issues identified included:

- Insufficient amount of waste being diverted from landfill for recycling, and the resulting lost revenue from the sale of recyclables;
- The costs associated with waste diversion programs and how to best fund or offset them;
- Concern over the impact of increased waste management costs on tax rates;
- Ensuring the partnership between the County, the City and the EWSWA works well;
- The current lifespan of Essex-Windsor's landfill;
- Determining the best way to manage Essex-Windsor's waste and the landfill;
- The distance of the landfill from the City and the resulting impact on waste management collection contract costs;
- Identifying the most effective ways to divert waste from disposal;
- Motivating residents to care about waste management issues and to think more about waste diversion opportunities, such as recycling and grasscycling; and
- The need for municipal politicians, managers and leaders to be more educated on the topic of waste management to ensure they can make the correct decisions.

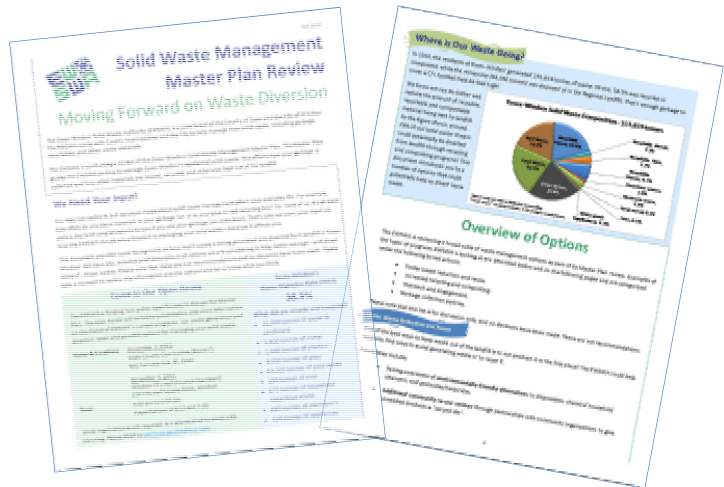
Potential opportunities that the interviewees said could help address these issues and help to improve waste management in Essex-Windsor included:

- Conduct additional research on new technologies;
- Educate the board members on waste management topics such as new technologies and what other similar municipalities have done to address similar waste issues;
- Provide more public education and communications on waste management, not just for residents but also for politicians, senior staff, clerks, and other municipal staff;
- Adopt appropriate new by-laws and enforce them, beginning first with educational steps (such as a warning sticker) and progressing toward stiffer penalties;

- Compact refuse at the transfer stations before shipping it to the landfill, so that fewer trips are made, thereby reducing transport costs; and
- Have satellite depots open to the public on Saturdays.

Options Brief

In October 2011, an options brief was prepared for posting on the EWSWA's website. The options brief provided a status update on Essex-Windsor's progress on waste diversion, promoted the then-upcoming public open houses, and listed the options being considered. Readers were encouraged to read the brief, attend the open houses, and provide their feedback on the options being considered and on how Essex-Windsor should move forward with waste management in Essex-Windsor (feedback obtained has been included with that through the open house).



Public Open Houses

Two public open houses were held to present an overview of Essex-Windsor's waste management status to the public and to discuss with them potential options for updating the EWSWA's Solid Waste Master Plan. Table 18 lists the date and location of the open houses and the number of people that attended (based on the sign-in sheets).

Table 18: Attendance at Public Open Houses

Public Open House 1	Public Open House 2
November 2, 2011	November 3, 2011
Essex County Civic Centre (Room C)	Windsor City Hall (Council Chambers)
360 Fairview Ave. W, Essex	350 City Hall Square West, Windsor
Attendance: 28	Attendance: 32

Each open house ran from 5:00 pm to 8:00 pm and included presentations at 5:15 pm and 7:00 pm. Participants were provided with a feedback form, which was also available online.

The feedback form asked residents which of a list of possible waste management options the EWSWA should consider for Essex-Windsor. The options receiving the most support included:

- Backyard composting, including providing backyard composters to residents (although there was little support for mandatory backyard composting);
- Expanding the list of materials included in the current recycling program;
- Introducing a curbside food waste organics collection program;
- Encouraging greater Extended Producer Responsibility;

- Use of bag limits;
- Bi-weekly collection of garbage (in conjunction with weekly collection of curbside food waste organics);
- A zero waste policy at municipal facilities; and
- Continuing with and innovating the EWSWA's waste management promotion and education programs.

There was little to no support and general opposition to:

- User pay; and
- Clear garbage bags.

There was mixed support with respect to mandatory recycling. Comments supporting that option suggested that a more aggressive approach is needed to enforce collection by-laws and that households that do not recycle should be fined. Comments opposing mandatory recycling said that it is too harsh, likely would not be accepted, and that instead recycling should be made more convenient.

Comments received are included in Appendix A.

8 Summary of Recommendations

The review of the EWSWA's Solid Waste Management Master Plan included a close look at the waste management programs available in Essex-Windsor, the types of residential waste being diverted and disposed by households, and opportunities for increasing the amount of waste being diverted from disposal. Based on the review of available options and feedback from the public, the following recommendations have been put forward as updates to the EWSWA's Solid Waste Management Master Plan, which should help Essex-Windsor achieve its 60% waste diversion target.

Garbage Collection

1. **Garbage Bag Set Out Limits** - It is recommended that the EWSWA propose to Essex-Windsor's individual municipalities that they move to a garbage bag limit of 3 bags or containers, to be reduced to a limit of 2 bags in the medium term, for the following reasons:
 - Bag limits are considered a waste management best practice;
 - Bag limits have been shown to encourage participation in waste diversion programs and increase waste diversion;
 - Bag limits are commonly used in municipalities across Ontario and North America;
 - Based on the survey of set out rates conducted in 2011, the majority of households should be able to conform to a 3 bag limit (and a subsequent 2 bag limit as new waste diversion programs are implemented).

Household Organics

2. **Food and Kitchen Organics Collection and Processing** - It is recommended that the EWSWA conduct a study to assess the feasibility of collecting and processing food and kitchen waste organics from households in Essex-Windsor. The study should include (but may not be limited to):
 - More detailed analysis of collection costs, including required equipment (e.g., carts and mini-bins, split body collection trucks, etc.);
 - The cost-effectiveness of implementing the program County-wide or just in urban or suburban areas;
 - The cost-effectiveness to construct a processing facility in Essex-Windsor to process the material (and potentially material from other municipalities) versus exporting the material to a private or other municipal facility;
 - The type of processing facility to construct, if it is determined that processing should be undertaken by the EWSWA;
 - Opportunities to cost-share with other municipalities (e.g., a regional composting facility);
 - Opportunities for cost-savings in garbage and recyclables collection (e.g., every other week garbage collection, co-collection of garbage or recyclables, etc); and
 - An implementation strategy (which should include pilot testing communication material, household collection, etc.).

This recommendation has been put forward because:

- Food and kitchen waste provides Essex-Windsor with its greatest opportunity for increasing waste diversion;
 - Without diversion of food and kitchen waste, Essex-Windsor is unlikely to achieve the targets outlined in the 1993 Master Plan or the provincial target of 60% waste diversion;
 - Experience with municipal collection methods and composting technologies in Ontario and other parts of Canada has increased in the past five years (e.g., new facilities in Hamilton, Guelph, Peel, Toronto, Ottawa, etc), and municipal composting programs are becoming more commonplace; and
 - Essex-Windsor may have the flexibility to either build its own facility (and potentially earn revenue by processing organics from other neighbouring municipalities) or export food and kitchen organics to another facility.
3. **Backyard Composting** - It is recommended that the EWSWA continue with its practice of making subsidized backyard composters available to residents. The EWSWA should assess making a limited amount of backyard composters available for free, possibly tied in with a waste diversion education activity or as an incentive for participation in waste diversion programs. This program is recommended because it:
- Provides Essex-Windsor with a cost effective program to increase its waste diversion rate;
 - Increases the amount of waste managed at the household, thereby reducing the amount of waste requiring collection and disposal;
 - Encourages other activities (e.g., gardening) that are beneficial for individuals and society;
 - Reduces the amount of organics entering the landfill, thereby reducing environmental management risks associated with landfilling organic material; and
 - Is an option that is appreciated by the public, particularly those with an interest in backyard composting and waste diversion.

Recycling and Reuse

4. **Larger Blue Bins** (22 US Gallon / 83 Litre) - It is recommended that the EWSWA proceed with planning the purchase of larger blue bins for distribution to Essex-Windsor households, as:
- The larger bins will allow households to place more materials in their blue bin, thereby reducing the amount of blue bin overflow that is placed into the garbage;
 - Households will need containers larger than the 60 litre (16 US gallon) blue boxes currently distributed, if mixed plastics or other materials are introduced into the blue box program;
 - It is expected that households will appreciate receiving a larger blue box with no out-of-pocket expense from them; and
 - Funding for larger blue boxes is available from the Continuous Improvement Fund, which will increase the cost-effectiveness of the option.

5. **Weekly Collection of Recyclables** - It is recommended that the EWSWA continue with its practice of instructing bidders to provide pricing for weekly and bi-weekly collection of recyclables in its collection tender³³, as:
 - It will allow the EWSWA to assess the cost-effectiveness of providing weekly recyclables collection; and
 - While weekly collection is more expensive, it has been demonstrated to provide increased diversion.

6. **Mixed Plastics** - It is recommended that the EWSWA introduce mixed plastics (e.g. bakery and produce clamshell containers) into the blue box recycling program because:
 - It will increase the EWSWA's waste diversion rate;
 - While there will be a cost for an additional sorter at the Material Recycling Facility, there is an opportunity for revenues to offset some or all of the additional cost and generate revenue;
 - It will increase the level of service provided to residents, who have asked for the ability to recycle more materials; and
 - It may make sorting of plastics easier for residents.

7. **Polystyrene** - It is recommended that the EWSWA pilot test accepting polystyrene (Styrofoam) at its recycling depots and promote the opportunity, as it will:
 - Raise service levels for residents by providing them with an opportunity to recycle this material;
 - Potentially increase the efficiency and effectiveness of the EWSWA's blue box program by keeping polystyrene out of the blue box stream;
 - Help measure the cost-effectiveness of recycling polystyrene in Essex-Windsor and whether a densifier is warranted; and
 - Help to confirm the amount of polystyrene waste available for recycling.

8. **Plastic Film** - It is recommended that the EWSWA pilot test accepting plastic film (e.g., plastic grocery bags) at its recycling depots, engage local retailers to establish a local plastic bag take-back bin at their outlets, and promote these opportunities to residents. This recommendation is being put forward because it will:
 - Help raise Essex-Windsor's waste diversion rate;
 - Help measure the cost-effectiveness of accepting plastic film at the EWSWA's recycling depots;
 - Increase the level of service to residents by providing them with an opportunity to recycle this material; and
 - Potentially increase the efficiency and effectiveness of the EWSWA's blue box program by keeping plastic film out of the blue box stream.

³³ Next recycling collection tender occurs in 2016

9. **Satellite Depots** - It is recommended that the EWSWA assess the feasibility of establishing waste diversion depots in strategic locations across the County as a means to provide greater convenience and increased participation. The assessment should include (but not be limited to):
- Preferred strategic locations, from both an operations perspective and a customer service perspective;
 - The types of materials that would be accepted at the depots;
 - Whether the depots would be staffed;
 - Estimated increase in waste diversion; and
 - Anticipated costs.

This recommendation is being put forward because:

- It would provide another opportunity where residents can take their overflow blue box materials and other divertible materials that may not otherwise be collected curbside (depending on what is accepted at the depots); and
- It is a potentially cost-effective way to raise the level of service provided to the residents of Essex-Windsor.

10. **Reuse Centre Partnerships** - It is recommended that EWSWA explore potential partnerships with charitable organizations to construct, operate or otherwise facilitate a reuse centre

This recommendation is being put forth because:

- There is the potential for added diversion from this option;
- In addition to diverting waste from disposal, reuse centres help to fulfill a community need for low-price household goods;
- Such a partnership would likely be more cost effective than having EWSWA establish a reuse centre on its own and would help support local charity;
- EWSWA would be able to build upon the reuse activities by promoting other opportunities for waste reuse (e.g., thrift stores, existing reuse organizations, reuse online networks such as freecycle and Craigslist).

11. **Mandatory Recycling** - It is recommended that the EWSWA propose that the Essex-Windsor municipalities and the EWSWA collectively discuss the feasibility of introducing mandatory recycling in Essex-Windsor. This discussion should include (but not be limited to):

- Whether mandatory recycling is introduced in a new or existing municipal by-law;
- The purpose of mandatory recycling in Essex-Windsor and how it would be used (e.g., as an educational tool, degree of enforcement, etc);
- What constitutes "recycling" (e.g., a certain number of blue box set-outs during a period of time, blue box materials prohibited from being placed in the garbage, etc);
- The level of enforcement (e.g., passive or active enforcement, use of fines or refusal of garbage collection service, etc);
- Examples of how mandatory recycling has been implemented in other municipalities, including wording used in other by-laws or policies; and

- The need for it to be consistent across all Essex-Windsor municipalities.

This recommendation is put forth because:

- Mandatory recycling provides additional credence to educational activities;
- It provides municipalities with a legislative backdrop against which other programs can be implemented;
- It provides municipalities with the means to address excessive waste disposal behaviours or absent waste diversion practices; and
- Municipalities have the flexibility to enforce a mandatory by-law as much or as little as they want, depending on what is required and the intent of the by-law.

Outreach

12. **Promotion and Education** - It is recommended that the EWSWA continue with its qualitative and quantitative research on barriers to recycling and other waste diversion programs in order to better understand how residents recycle, their barriers and motivation for participating in the waste diversion activities, and how to overcome the barriers.

It is also recommended that the EWSWA develop a Community-based Social Marketing campaign to address the barriers identified in the market research. Based on the barrier research, incentives may form part of the Community-based Social Marketing campaign.

These recommendations are put forward because:

- Promotion and education is a best practice;
 - It is one of the most cost-effective ways of increasing participation in waste diversion programs and increasing the amount of waste diverted;
 - Increased promotion and education is an option well supported by residents;
 - Without sustained promotion and education, waste diversion programs will not work optimally (i.e., participation will drop off, or residents will participate incorrectly, which increases processing costs).
13. **Extended Producer Responsibility (EPR)** - It is recommended that the EWSWA and local municipalities alike continue with efforts to lobby for increased Extended Producer Responsibility (EPR) because:
- It can be incorporated as part of staff or politicians regular duties with no additional capital expense; and
 - It can ultimately result in reduced cost to the municipality for waste diversion programs as product stewards increase funding for programs or assume responsibility for specific waste materials (e.g., tires, electronics, alcohol containers, etc).

SUMMARY OF RECOMMENDATIONS

A summary of the recommended Master Plan updates is provided in Table 19. The recommended updates will help the EWSWA manage Essex-Windsor's waste into the future and, if implemented in full, achieve the Provincial waste diversion target of 60%. The estimated annual operating cost to implement the entire suite of updates is approximately \$4.8M (net), primarily due to the introduction of a curbside kitchen waste organics program. However, this assumes the program is implemented County-wide. If the program is implemented in only urban and suburban areas, then the annual operating cost (and the amount of food and kitchen organics diverted) would be less. Similarly, the estimated capital costs of these recommended Master Plan updates is approximately \$2.8M, when alternative funding sources such as the CIF are factored in. As the largest part of the cost is attributed to the County-wide curbside collection of food and kitchen organics, the capital costs would be lower if the food and kitchen waste program is limited to urban and possibly suburban areas of Essex-Windsor.

It is important to note that the increases in diversion rates and tonnage listed in Table 19 are not necessarily cumulative, as some initiatives will support some aspects of other programs. For example, some of the tonnage attributed to larger blue boxes may also be included in that of mixed plastics or promotion and education.

Table 19: Estimated Cost and Diversion of Preferred Options

Recommendation	Estimated Operating and Capital Cost	Estimated Diversion Increase(%)	Estimated Diversion Increase (tonnes)
1. Garbage Set Out Limits	Minimal increase in operating cost (promotion, education and enforcement)	2% to 6%	3,000 – 9,000
2. Food & Kitchen Organics Collection & Processing	Capital: Program implementation (including purchase of carts, not including facility costs): \$2.5 M Annual operating: 4.6 M (assumes County-wide; offset by potential garbage collection and disposal savings)	Up to 15%	23,000
3. Backyard Composting	Operating: \$5,000 - \$10,000 for promotion and education	1% to 3%	1,500 to 4,600
4. Larger Blue Bins	\$350,000 (includes \$850,000 in capital costs, distribution and promotion, with \$540,000 potentially recovered with CIF funding)	2% to 4%	3,100 to 6,200
5. Weekly Collection of Recyclables	to be determined through tender process	2% to 3%	3,100 to 4,600
6. Mixed Plastics	Operating: \$44,000 (potentially offset partially or in full by revenues from sale of recyclables)	1%	1,400 t
7. Polystyrene	\$163,000 - \$229,000	less than 1%	320
8. Plastic Film	Minimal if collected at retail	2.5%	3,800
9. Satellite Depots	Capital: \$5,000 to \$10,000 per depot	1% - 2%	1,500 – 3,100
10. Reuse centre Partnerships	To be determined by nature of partnership	1%	1,500
11. Mandatory Recycling	to be determined with level of enforcement required	2%	3,100
12. Promotion and Education	Operating: \$10,000	1% to 4%	1,500 to 6,200
13. Extended Producer Responsibility (EPR)	Staff time	1% to 3%	1,500 to 4,600