



The Regional Municipality of Durham Report

To: The Joint Works and Finance & Administration Committee
From: Commissioners of Works and Finance
Report: #2016-J-7
Date: February 4, 2016

Subject:

The 2016 Solid Waste Management Servicing and Financing Study and forecast 2017 to 2025

Recommendations:

The Joint Works and Finance and Administration Committee recommend to Regional Council that:

- A) The annual 2016 Servicing and Financing Study and forecast for 2017 to 2025 be received for information to support upcoming detailed Business Planning and Budget deliberations, and set the context for 2016 Budget approvals related to the major program area of Solid Waste Management.
- B) A Request for Proposals (RFP) be issued for a consultant at a cost not to exceed \$0.1 million to be funded from the 2016 Solid Waste Management Operations Budget, to identify capital, design, regulatory, costing requirements and service delivery options for a new Clarington municipal hazardous and special waste (MHSW) facility to be located at the Regionally owned property at Regional Road #57 and Highway #2 in the Municipality of Clarington, in order to satisfy the requirements of the existing Host Community Agreement with the Municipality of Clarington, and report back to award the RFP..
- C) RFP (s) be issued to obtain consulting expertise in anaerobic digestion (AD) at a cost not to exceed \$0.4 million to be funded from the 2016 Solid Waste Management Operations Budget, with a report back to Joint Committee in the spring of 2016 to award the RFP (s) including:
 - i. A technical advisor, with experience and expertise in AD processing facilities that are capable of processing Regional organics waste streams, to assist the Region in defining suitable potential AD options, and service delivery models, and associated regulatory, market and other requirements, costing and potential risks;

- ii. A financial advisor, with adequate knowledge of AD-type processing facilities, potential partnerships and related fuel input and energy output sales markets and expertise in business case, risk and service delivery analysis, in order to assist the Region in conducting an options analysis, including reviewing all recent studies, to confirm that an enhanced integrated waste management system and AD is the best waste management option for the Region and assessing identified technical options and identifying net benefits/costs, potential budgetary and property tax implications; and
 - iii. Staff prepare a joint report back to Regional Council prior to September 2016 outlining the business case analysis and recommended next steps.
 - D) The reuse goods program partnership become a permanent component of the Region's waste diversion programs to be funded from the annual Waste Management Operations Budgets, at an estimated cost of \$24,000 per year.
 - E) The 2016 Regional Fees and Charges schedule for Solid Waste Management be approved with one change to the cost of disposing of garbage/mixed loads at the Region's Waste Management Facilities (WMFs): an increase of four per cent from \$120 per tonne to \$125 per tonne beginning July 1, 2016 (Note: there has been no fee change since 2007 and separated designated diversion materials will continue to be accepted free of charge).
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Report:**1. Purpose**

- 1.1 This report updates Solid Waste Management programs and associated financing challenges for the 2016 to 2025 business planning period and sets the stage for the detailed 2016 Solid Waste Management Business Plan and Budget review and approvals.

2. Background

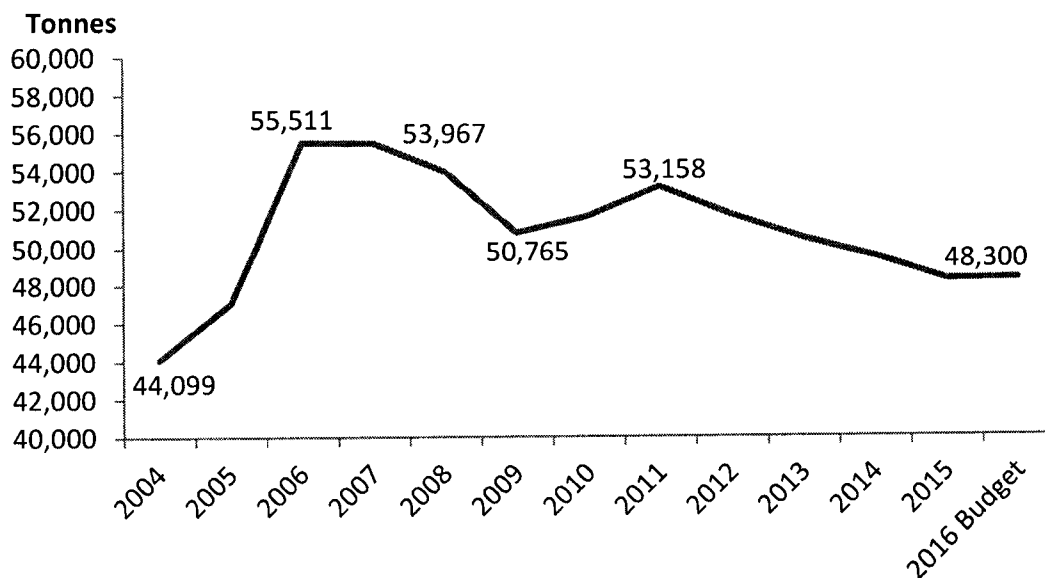
- 2.1 The Region has implemented new waste diversion programs and improvements to existing programs to enhance diversion beyond 50 per cent (a 17 per cent increase since 2004), including introduction of the composting of source-separated organics and garbage bag limits, enhanced Blue Box recycling through expansion of materials accepted, and other new diversion collection programs implemented both at waste management facilities (WMFs) and at the curb (e.g. electronics, porcelain, batteries collection and diversion programs).
- 2.2 Despite efforts to increase the tonnage-based diversion rate further to achieve the Region's 70 per cent diversion goal, changes to industry products and packaging due to changing Provincial policy and specifically extended producer responsibility

(EPR) will continue to impact municipally-reported waste diversion rates, tonnages and diversion programs. Although recognized as a societal benefit, EPR policies have incented producers to reduce and make recyclable products and packaging lighter. Lighter materials are not only more complex and voluminous for municipalities to handle and process, but they replace heavier materials which once counted toward municipal diversion rates.

2.3 In response to this trend, Regional Council approved a construction and demolition (C&D) materials recycling program pilot in 2015, which commenced in late October 2015 and has already resulted in over 400 tonnes of new diversion. For 2016, this program, including wood, shingles, dry wall etc., is anticipated to increase diverted tonnes by up to 2,500 tonnes on an annualized basis, representing an increase in diversion of one per cent. The cost to divert this material to one vendor in 2016 is approximately \$0.2 million. As an additional benefit, this diverted material will reduce residual waste destined to the Durham York Energy Centre (DYEC), alleviating future growth capacity constraints.

2.4 However, anticipated C&D volumes are not expected to offset the trend of decreasing Blue Box tonnages which have been on the decline since peaking in 2006 at 55,511 tonnes. The 2016 Budget projection is 48,300 tonnes (equivalent to the actual tonnage for 2015), or 13 per cent lower than the 2006 peak.

Graph 1
Blue Box Diversion Tonnages (2004 to 2015 Actuals and 2016 Budget)

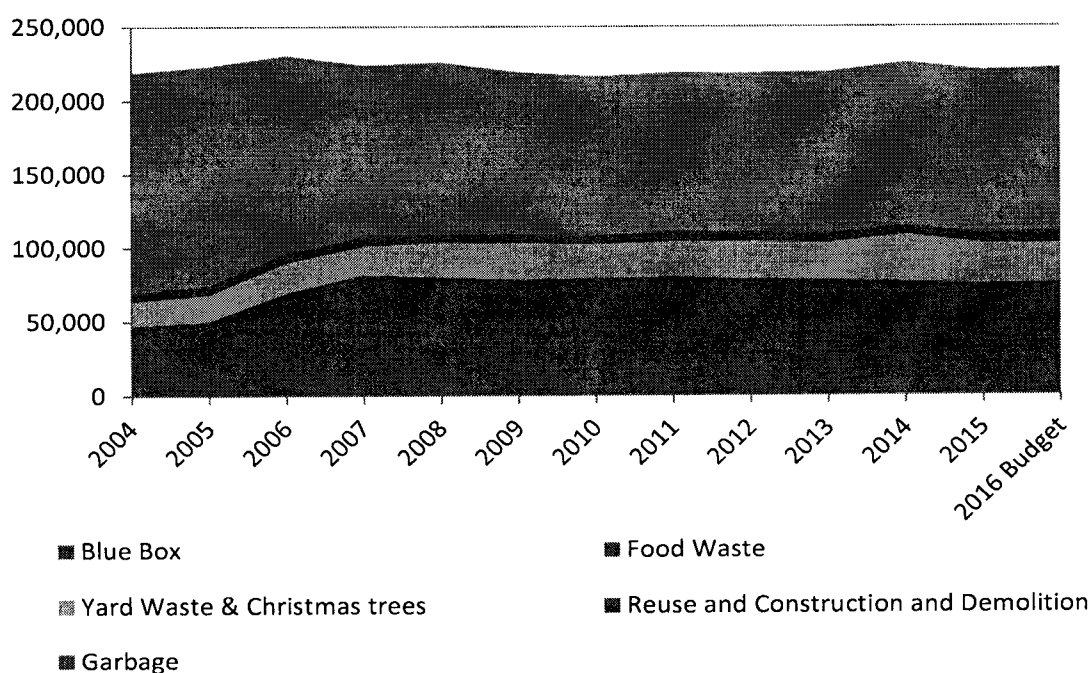


- 2.5 This trend is anticipated to continue given the continuing shift of responsibility for diversion materials to producers. On November 26, 2015, the Province introduced Bill 151, *The Waste-Free Ontario Act*. The proposed legislation is intended to create 'a circular economy' increasing resource recovery and waste reduction in Ontario. A full report and recommendations to the Province regarding the new legislation is provided within the companion Report #2016-J-6.
- 2.6 Provincial policy changes since 2014 have been significant, and based on the leadership role Durham has taken on this issue, various municipal associations, including the Regional Public Works Commissioners of Ontario (RPWCO), Association of Municipalities of Ontario (AMO) and Ontario Waste Management Association have described the current waste diversion rate calculation as being outdated. The calculation no longer accounts for the constantly changing products, packaging and shifting waste management responsibilities that have taken place over time.
- 2.7 Under new regulations, while municipalities expect to continue responsibilities for the collection, processing and disposal of organics and residual garbage, the designated diversion programs, including Blue Box, will be significantly changed over the forecast period. With considerable uncertainty around the proposed framework and funding regime details, a wait-and-see approach is prudent for affected programs, including Blue Box, Municipal Hazardous and Special Waste (MHSW) and other currently designated Waste Diversion Ontario (WDO) programs e.g. tires and waste electronics and electrical equipment (WEEE).
- 2.8 The focus of diversion on a go-forward basis will be the organics waste stream, which studies demonstrate does remain a significant portion of the residual garbage stream destined for the new DYEC. Recommendations are made, as described within, to both address the limited capacity available for organics processing, and to implement enhanced organics and recycling programs (residential and multi-residential) through a comprehensive and long-term organics management plan. More detailed technical and financial study and business case analysis is recommended as the next step towards the potential implementation of organics pre-sort technology which could provide suitable feed stock to support the operation of a potential future AD type technology. Proposed detailed studies are consistent with current Regional Council direction, and will include analysis of technology, transfer and processing logistics, financial and market feasibility, and existing potential for partnerships, both public and private.
- 2.9 A joint report back to Regional Council is anticipated during 2016, including business case analysis. The capital forecast includes an estimated cost for pre-sort technology, transfer requirements and an AD facility, which will be refined as evaluations and approvals are completed. The total estimated cost is \$43.0 million including a new AD facility (\$30 million) and a new transfer station and pre-sorting equipment (\$13.0 million).

3. Solid Waste Management: Volume Trends and Diversion Rates

- 3.1 Overall, tonnages and stop count growth have been relatively flat in recent years with some reduction in processing and disposal expenditure growth pressures. The following chart demonstrates relatively flat overall tonnage growth, with increased non-Blue Box diversion and since 2006, steadily declining Blue Box tonnages received and processed through the municipal solid waste management program.
- 3.2 The 2016 tonnage estimate is 221,674 tonnes, an increase of 1,406 tonnes over the 2015 actual of 220,268 tonnes (less than 1 percent growth).

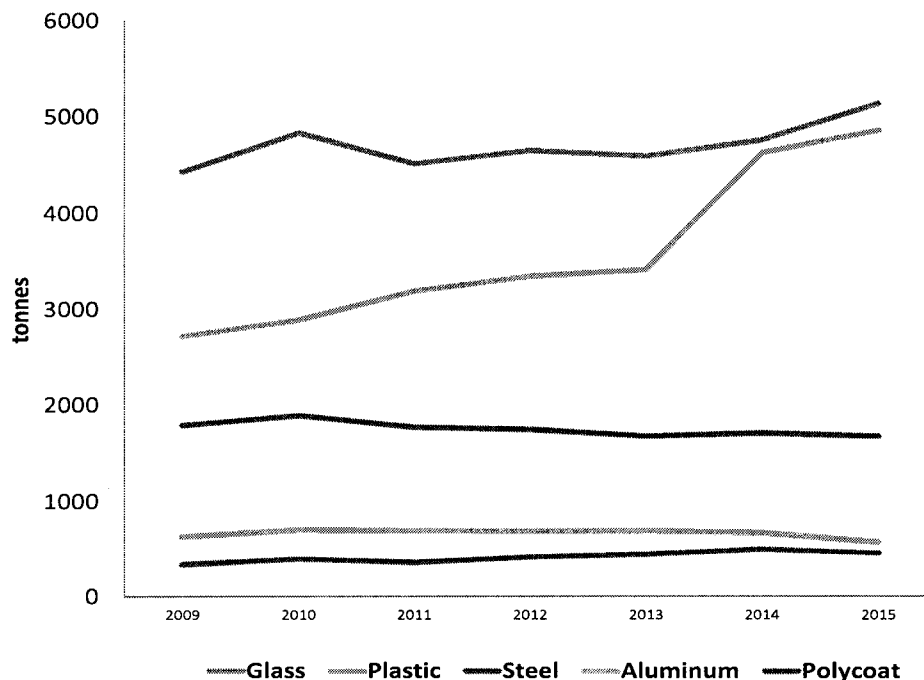
Graph 2
Diversion and Residual Garbage Waste Streams
2004 to 2015 Actual Tonnes and 2016 Budgeted



- 3.3 Over the previous decade, tonnage growth was approximately 0.3 per cent per year (2004 to 2014) compared to approximately two per cent tonnage growth over the previous decade. The total 2015 tonnages, including diversion and garbage are 2.3 per cent lower than 2014, due to reduced diversion tonnages and a low 0.1 per cent garbage growth rate. Reduced growth tonnages are a result of provincial product stewardship programs and industry packaging reductions, slower economic growth, and declining tonnage of waste being generated per household. It must be noted that this does not mean less waste is being managed. In fact, 2015 saw the highest volume (i.e. as opposed to weight) of recyclables managed at the Region's material recovery facility since it was built in 2007.

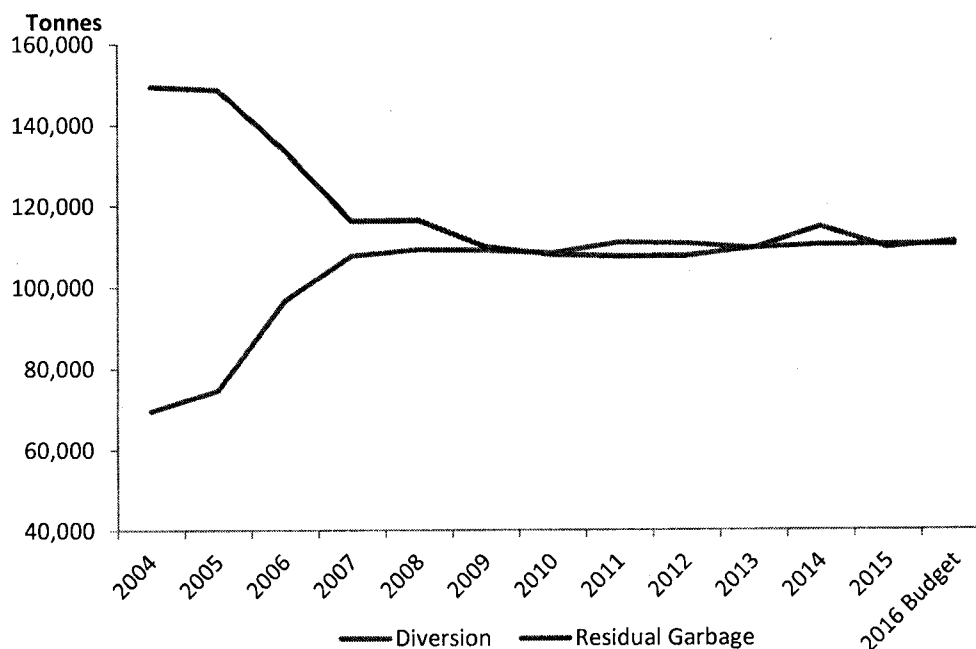
3.4 The following graph illustrates the transition from heavier packing materials such as metal and glass to lighter more voluminous materials such as plastics that has impacted the overall tonnage estimates. This means that, while material tonnage has been decreasing, the number of units being managed continues to grow significantly. Since the peak in 2006, Blue Box material tonnages have fallen 7,243 tonnes (55,511 tonnes in 2007 to 48,268 tonnes in 2015), despite household growth of nearly 35,000 units over the same period. This is the result of change in packaging to lighter materials, return to retail (such as the Bag It Back for LCBO containers).

**Graph 3
Container Material Trends
2009 to 2015 Actual Tonnes**



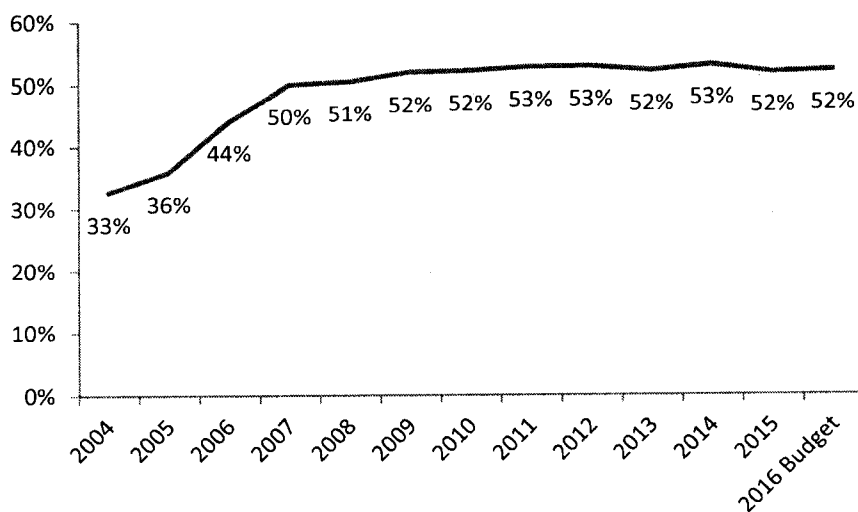
3.5 The following two graphs show the trends in diversion and residual garbage tonnage and overall diversion rates. The overall diversion rate has been consistent since 2007 (ranging from 50 per cent - 53 per cent) despite the drop in Blue Box material tonnage. The drop in Blue Box tonnage has been offset by increased yard waste tonnage and reuse and C&D material tonnage. The most significant diversion increases occurred between 2004 and 2009, with significant expansions due to the introduction of the Green Bin program and subsequent expansions to Blue Box program materials and diversion collection programs. A small spike in diversion in 2014 is attributed to a one-time increase in leaf and yard waste composting at the beginning of the year, and results from the 2013 ice storm clean-up rather than a changed program or participation level.

Graph 4
Diversion Versus Residual Garbage Tonnes
(2004 to 2015 Actuals, and 2016 budgeted)



Note: Diversion tonnes include Blue Box, Green Bin, Yard Waste, Christmas trees, Reuse programs and an estimate of 2,500 tonnes of new diversion from the construction and demolition materials recycling pilot launched in October 2015.

Graph 5
Durham Region WDO Diversion Rate
(2004 to 2015 Actuals, and 2016 budgeted)



Note: Includes composter and grass cycling credits and estimated 2016 construction and demolition materials diverted through the new pilot (approximately 2,500 tonnes).

- 3.6 In addition to promoting the Region's waste diversion programs, an increasing effort has been made by waste communications staff to focus promotion and education on the importance of reducing food waste and the prevention of waste generation through partnerships with charities, increased reuse, better purchasing habits and return to retail initiatives.

4. 2016 Financial Outlook

- 4.1 One of the key deliverables in 2016 remains the commencement of commercial operations at the Durham York Energy Centre (DYEC), anticipated in early February 2016.
- 4.2 There is also a Host Community Agreement (HCA) commitment to implement a Municipal Hazardous and Special Waste (MHSW) facility in the Municipality of Clarington. An opportunity has been presented with a Regionally-owned property soon to be vacated by the Durham Regional Police Service (DRPS) located at Highway #2 and Regional Road #57. Solid Waste Management staff view this location as ideal for a drop off location based upon the size of the property and building and the convenient location provided for residents dropping off hazardous materials free of charge. As this location will not accept garbage waste, it will not require a scale house and the traffic volume will not be comparable to full service waste management facilities (WMFs) whose tonnages are dominated by residual and mixed load waste materials.
- 4.3 The retention of an engineering consultant is recommended in 2016 at a cost of \$0.1 million to explore options and costs for the implementation of the MHSW commitment by early 2017. The project approval will be brought forward prior to construction which will commence in 2016. The capital forecast includes \$1.0 million for 2016 (\$0.1 million for consulting fees and \$0.9 million for construction). There are no operational impacts for 2016 as the facility is not expected to be operational until early 2017. The 2017 Solid Waste Management Servicing and Financing Study will identify the estimated operating costs of the Clarington facility in 2017 and the potential funding from industry funding partners. As an example, the funding from industry partners currently offsets the costs to operate the Pickering MHSW waste facility.
- 4.4 The 2016 Budget also includes \$0.4 million to retain consulting services to explore the opportunities with AD technology to divert additional food waste from the garbage stream.
- 4.5 In 2016, cost pressures from the implementation of new diversion programs are also anticipated. Based on 2015 approvals, a new construction and demolition (C&D) materials diversion pilot was launched in October 2015, and is proposed to continue through 2016 at an estimated cost of approximately \$0.2 million. Staff through early 2015, monitored the availability of end-use markets for the diversion of construction and demolition (C&D) materials, such as asphalt shingles, contaminated wood, and contaminated drywall collected at Regional WMFs. It is anticipated that in 2016, the

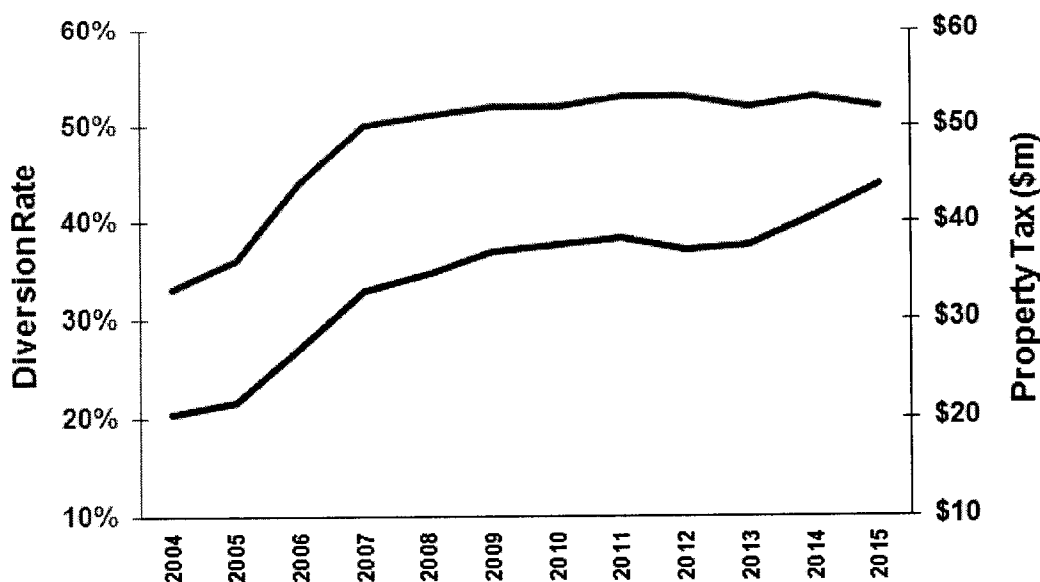
new diversion pilot will divert approximately 2,500 tonnes of C&D waste on an annual basis from disposal. Staff will report back with financial impacts from the pilot project in the 2017 Solid Waste Management Servicing and Financing Study.

- 4.6 As directed in 2015 staff had also investigated the feasibility of diverting bulky rigid plastics through the existing curbside call-in service. These consist of plastics from items such as baby seats, toys, lawn furniture, helmets, baskets, etc. Staff will continue investigating potential end-use markets and collection and processing options for developing a bulky rigid plastic recycling program in 2016, as well as any implications with the proposed new *Provincial Waste Free Ontario Act* legislation (Bill 151) and will report back on any proposed next steps.
- 4.7 Net 2016 Solid Waste Management Budget impacts will also continue to include the following as further detailed in the pending 2016 Solid Waste Management Business Plans and Budgets:
- A) Net tonnage and stop count changes;
 - B) Contractual escalation for collection, transfer, inspection, haulage and disposal contracts; and,
 - C) Facility maintenance, repairs and replacements per the Region's asset management program.

5. Forecast Pressures and the Proposed 10-year Capital Program

- 5.1 The following chart illustrates the correlation between the implementation of diversion programs and rising net property tax expenditures for solid waste management.

Graph 6
Solid Waste Diversion and Regional Net Solid Waste Expenditures
(2004 to 2015)



- 5.2 The most significant program cost increases occurred when collection responsibilities had been uploaded from six of the eight local area municipalities (by 2004) and curbside diversion collection programs were introduced (Green Bin) or expanded (Blue Box plastics).
- 5.3 Future programs necessary to achieve 70 per cent diversion will have significant capital and operational cost impacts, including new staffing requirements. The analysis of options continues regarding proposed facilities and equipment to support waste transfer, storage and inspection, organics pre-sorting capabilities, and AD technologies with potential to increase organics diversion. Recommendations on these proposals will be presented based on the outcomes of the ongoing and recommended studies over 2016 and the proposed Bill 151.
- 5.4 Net 2016 to 2025 expenditure and financing pressures in solid waste management will include:
- A) Development of a comprehensive long-term organics diversion plan, possibly through an AD-type facility, supported by advanced available pre-sort technologies employed at an integrated waste transfer facility including enhanced waste inspection, sorting and storage capacity;
 - B) Landfill (seven closed landfills) perpetual monitoring, risk management and remediation and landfill mining based on the Blackstock landfill pilot commencing in 2016 (funding approved in 2015);
 - C) Potential for expanded reuse diversion programs, including changes to curbside programs, special events and program changes at existing and/or new Regional waste management facilities (WMFs), subject to business case and changing provincial policies related to designated materials; and,
 - D) Ongoing capital maintenance, repairs, replacements per the Region's Corporate Asset Management Program.

5.5 Including estimates to accommodate these potential initiatives currently under investigation, the proposed 10-year capital program is shown in the table below.

Table 1
Preliminary Solid Waste Management Major Capital Forecast (\$ Millions)⁽¹⁾⁽²⁾

	Proposed 2016	2017	2018	Forecast 2019	2020	2021- 2025	Total 2016- 2025
Landfill remediation/reclamation	-	0.5	1.5	1.1	0.3	1.3	4.7
Waste Transfer Facility with organics pre-sort technology	-	7.0	6.0	-	-	-	13.0
Clarington MHSW ⁽³⁾	1.0	-	-	-	-	-	1.0
Eco-Reuse Diversion	-	-	-	0.6	3.2	5.2	9.0
Organics Plan Capital/AD	0.4	30.0	-	-	-	-	30.4
Seaton Facility	-	-	-	-	8.5	-	8.5
Total Capital	1.4	37.5	7.5	1.7	12.0	6.5	66.6

Notes:

- (1) Capital projections are subject to further review and business case analyses as required per Council direction related to waste transfer facilities and equipment, eco-station development, pre-sort technology implementation and anaerobic digestion. Required capital may include public or private partnerships and/or grants and will be identified by required business cases as part of project approvals.
- (2) May be impacted by proposed Provincial legislation.
- (3) Includes \$0.1 million in consulting fees and \$0.9 million for construction.

5.6 Should ongoing feasibility, options and business case analyses support the proposed capital plan to 2025, the solid waste staffing complement is also forecast by the Waste Division to increase. Other operational costs could increase due to new facilities construction or expansions. It is anticipated that reports and recommendations on pre-sort technology options, AD and transfer station will be forthcoming over 2016, including business case analyses.

5.7 Noted above as a significant capital forecast pressure, the Region continues to investigate leading edge waste management technologies with potential to capture the remaining divertible materials in the single family garbage stream, and the growing number of multi-family residences. To this end, and to meet strict environmental compliance requirements, staff is investigating transfer station pre-sorting options to maximize diversion of organics. Recent technological advancements in sorting equipment may allow for a last stage pre-sort at waste

transfer to maximize the capture of divertible materials from the garbage stream, post collection and prior to disposal. Staff continues to investigate these technologies as a means to increasing diversion in the multi-residential sector and AD has been identified as a proven technology to process hard to compost organics.

- 5.8 To facilitate more detailed investigation of both pre-sort and AD options, it is recommended herein that technical and financial consulting engagements be secured at a 2016 cost of no more than \$400,000 to be funded from the proposed Solid Waste Management Budget.
- 5.9 Based on 2015 approvals and Report #2015-WR-5, Golder Associates has been selected to prepare a work plan, regulatory documentation and to provide construction management for the approved Blackstock Landfill Mining Project, including application to amend the site ECA to obtain MOECC approval. Once Ministry approval is received, the Region will be legally obligated to complete the landfill mining project, currently estimated to cost up to \$1.0 million (with funding approved in 2015).
- 5.10 The sources of financing for the proposed 10-year capital program will be analyzed through the business case analysis (including any grant opportunities) for the various projects and presented to Regional Council. Staff will also review the changes to the Development Charge Act through Bill 73 to explore the opportunities of a Regional Development Charge for Solid Waste Management Diversion which could provide funding for growth-related capital related to solid waste diversion.

6. Regulatory and Market Risks and Uncertainties

- 6.1 The Solid Waste Management program faces risks which are continuously monitored by staff. Risks and uncertainties affecting the process of Solid Waste Management Business Planning and Budgets include fluctuations in residential waste tonnages, collection stop counts, and commodity market pricing for various waste diversion materials sold to end-markets. As noted, subsidy levels and Provincial waste policies and legislation are influences beyond the Region's direct control.
- 6.2 It is unclear what restructuring or funding regime changes will be implemented at the Provincial level, in regards to the proposed new legislation under the '*Waste Free Ontario Act*.'
- 6.3 Staff continues to work with the MOECC, the Environmental Commissioner of Ontario, Waste Diversion Ontario, industry stewards, the Association of Municipalities of Ontario, the Regional Public Works Commissioners of Ontario, the Municipal Waste Association, the Recycling Council of Ontario and with the Ontario Waste Management Association. Regional staff will remain involved in ongoing consultations and will keep Regional Council apprised of any proposed changes and their implications to the Region. Key considerations include impacts due to future shifts in responsibilities under the proposed Bill 151 (e.g. from municipalities to industry stewards), potential utilization of municipal infrastructure and options to

ensure full cost recovery on behalf of Regional taxpayers.

7. Climate Change Considerations

- 7.1 Municipal Solid Waste Management programs are recognized as key contributors to achievement of a low carbon society. The purpose of municipal solid waste management is to manage residual materials to the highest and best environmental outcome, including diverting materials out of the residual solid waste stream for re-use, recycling and composting. Re-using and recycling materials is far less energy and carbon-intensive than the production of comparable materials from virgin sources. Municipal programs result in significant reductions to Ontario carbon emissions by minimizing the amount of waste sent to landfills. This is accomplished through a multitude of programs including: re-use programs; blue box recycling; organics composting, resident education programs; and solid waste energy recovery.
- 7.2 Based upon the Region's carbon footprint, it is estimated that GHG emissions from the Waste Management Division represent just over 40 per cent per cent of corporate emissions, primarily due to stewardship of six closed landfills, which account for almost the entire Solid Waste Management emissions. Combustion of fuels and energy usage at waste facilities accounts for less than 1 per cent of total estimated program emissions (based on 2012 estimates in Report #2013-J-25).
- 7.3 In terms of climate adaptation and risk management, the solid waste environmental studies program is responsible for the monitoring, inspection, and remediation of former closed Regional landfill sites, including consultations with the public and ensuring environmental protection which meets or exceeds regulatory compliance. Extreme precipitation significantly increases risks related to contamination migration. Adaptation-related activities include: inspections of former landfill sites; regular environmental monitoring and reporting; well-water testing adjacent to closed Regional landfill sites; and, undertaking any necessary repairs or improvements to protect the environment/ground water resources, including preventing rainfall infiltration and preventing leachate springs forming around landfills.
- 7.4 The Region has also completed investigations of alternative options for the remediation of the smaller Blackstock, Scugog and Scott landfills, including a landfill mining study at the Blackstock Landfill. Landfill mining is considered an alternative to traditional options for leachate control, which include purchasing containment attenuation zones around closed landfills. In 2015, a pilot to landfill mine the Blackstock Landfill was approved and will commence in 2016 at a cost of approximately \$1 million, subject to regulatory approvals. Should this endeavor be successful, there will be climate adaptation co-benefits, as reduced methane emissions will be coupled with reduced risks of leachate during extreme precipitation events.

8. Conclusion

- 8.1 Durham Region operates its waste management program as a fully integrated system. Integrated Waste Management Systems combine waste prevention, recycling, composting and disposal programs to minimize waste and utilize resources efficiently. Durham Region has many of the key elements of an integrated system and continued success depends on maintaining a consistent service delivery across all eight local municipalities.
- 8.2 Waste management systems are complex and influenced by various external factors. Never static, waste management best practices continually evolve to address changing demands and opportunities, including: population growth; commodities market fluctuations; demographic changes; policy, regulation and funding changes; evolving products and packaging; market directions; technological advancements and, more recently, climate change impacts. It is imperative that the waste management system continue to adapt to meet future waste management needs effectively and efficiently.
- 8.3 There remains uncertainty with respect to the proposed Bill 151 and the future responsibility of Blue Box material and other diversion goods like tires and electronics. Staff will continue to update Regional Council on the potential impacts of Bill 151 and move forward with initiatives that increase diversion rates (e.g. the pilot project for C&D materials and the investigation of AD technology to remove organics from the garbage stream).
- 8.4 Final recommendations for the detailed Solid Waste Management Business Plan and Budget will be presented to Works Committee and Regional Council in early February 2016.

Respectfully submitted,

R.J. Clapp, CPA, CA
Commissioner of Finance

C. R. Curtis, P. Eng., MBA
Commissioner of Works

Recommended for Presentation to Committee:

G. H. Cubitt, M.S.W.
Chief Administrative Officer

If this information is required in an accessible format, please contact 1-800-372-1102 ext. 2305

DETAILED REPORT

The following detailed report summarizes Solid Waste Management pressures and priorities identified for 2016 and over the 2017 to 2025 forecast period, including proposed new capital and waste diversion programs or enhancements to existing programs, and go-forward risks and uncertainties related to changing regulatory and market environments.

1. Solid Waste Management Operations: Waste Tonnages

- 1.1 Population growth and new residential development directly impact solid waste management requirements and costs. The Regional Waste By-law 46-2011 directs how municipal waste services are provided to new homes and/or multi-residential properties. New residents can receive complimentary diversion kits that include two blue boxes, one green bin and one kitchen container, along with complimentary compostable liner bags and a municipal waste calendar. In 2015, over 5,000 diversion kits were distributed related to new and resale Durham households.
- 1.2 Tonnages are a main driver of the Region's Solid Waste Management Budget. Provincial product stewardship policies, the prolonged economic slowdown and lowered retail sales, have had a continuing impact on reducing the overall growth in waste tonnages. The average five-year tonnage growth rate has been relatively flat at 0.4 per cent average growth from 2010 to 2015.
- 1.3 The following table includes 2009 to 2015 actual tonnages and current 2016 projections.

Table 1
Actual Waste Received
2009 to 2015 and 2016 Budget Tonnage

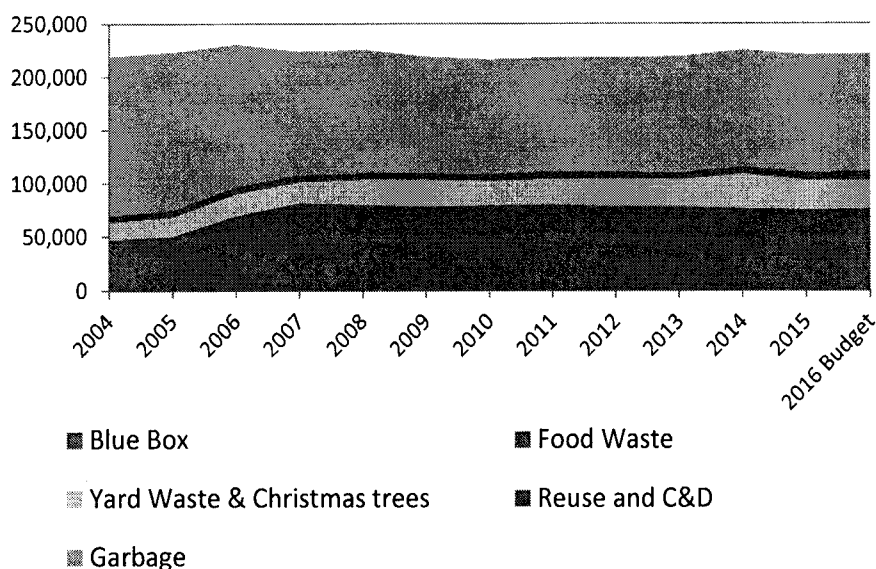
	2009	2010	2011	2012	2013	2014	2015	Budget 2016
Blue Box	50,765	51,610	53,158	51,688	50,466	49,531	48,268	48,300
Food Waste	27,454	27,593	26,865	26,898	27,487	27,007	26,796	27,500
Yard Waste ⁽¹⁾ & Christmas trees	24,895	23,076	23,744	25,469	25,268	32,123	27,554	26,580
Reuse and C&D ⁽³⁾	5,977	6,124	7,214	6,724	6,364	6,284	7,152	8,794
Garbage	109,999	108,000	107,670	107,722	109,641	110,417	110,498	110,500
TOTAL ⁽²⁾	219,090	216,403	218,651	218,501	219,226	225,362	220,268	221,674

Notes:

- 1 The increased yard waste tonnages in 2014 were due to the ice storm clean-up.
- 2 Although included in the diversion rate calculation, the table above excludes backyard composting and grass cycling diversion credits (approximately 9,977 tonnes in 2015).
- 3 C&D, or construction and demolition materials add an estimated 2,500 tonnes to diversion on an annual basis. The program is accounted for in 2015 (October – December) and 2016 totals, as it commenced in October 2015.

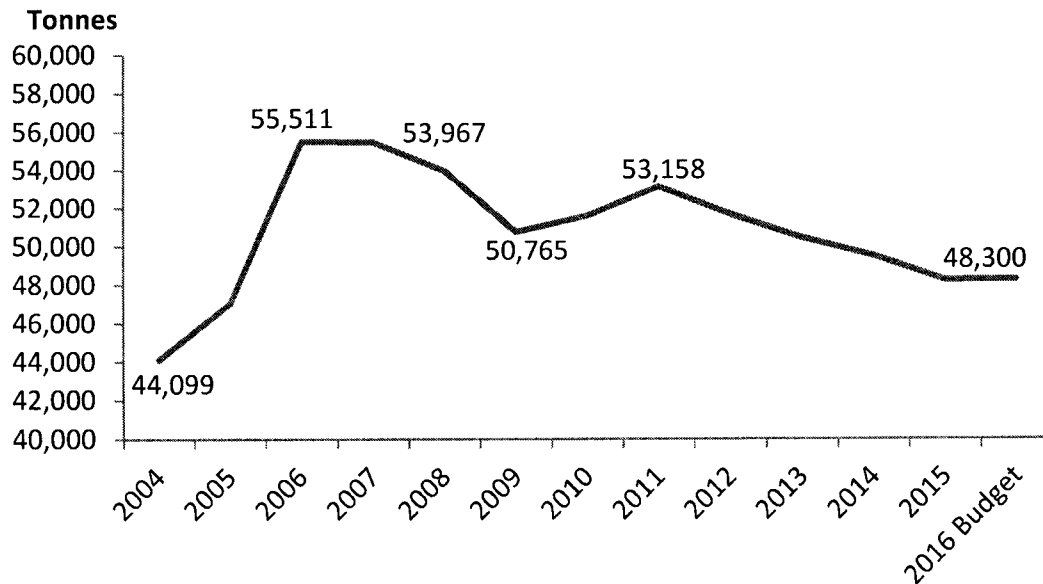
- 1.4 Overall, tonnage growth has been relatively flat in recent years. The following chart demonstrates relatively flat overall tonnage growth, with increased non-Blue Box diversion since 2006 and steadily declining Blue Box tonnages.

Graph 1
Diversion and Residual Garbage Waste Streams
Actual 2004 to 2015 Tonnes and 2016 Budgeted



- 1.5 Despite efforts to increase the tonnage-based diversion rate further to achieve the Region's 70 per cent diversion goal, changes to industry products and packaging due to changing Provincial policy and specifically extended producer responsibility (EPR) will continue to impact municipally-reported waste diversion rates, tonnages and diversion programs. Although recognized as a societal benefit, EPR policies have incited producers to reduce and make recyclable products and packaging lighter. Lighter materials are not only more complex and voluminous for municipalities to handle and process, but they replace heavier materials which once counted toward municipal diversion rates.
- 1.6 The following graph shows the decline in the Blue Box tonnages from a peak of 55,511 tonnes in 2006 to 48,286 tonnes in 2015 (budget for 2016 is 48,300 tonnes).

Graph 2
Blue Box Diversion Tonnages
(2004 to 2015 Actuals and 2016 Budget)



2. Collection Stop Counts

- 2.1 Since 2009, the Region has utilized stop count growth as determined by Municipal Property Assessment Corporation (MPAC) data, as a costing element for collection contract stop count adjustments within collection contracts. Collection service stop count growth in 2016 is projected at the five year historical average of 1.5 per cent.

Table 2
Actual Collection Stops
2010 to 2015 Actuals and 2016 Projected

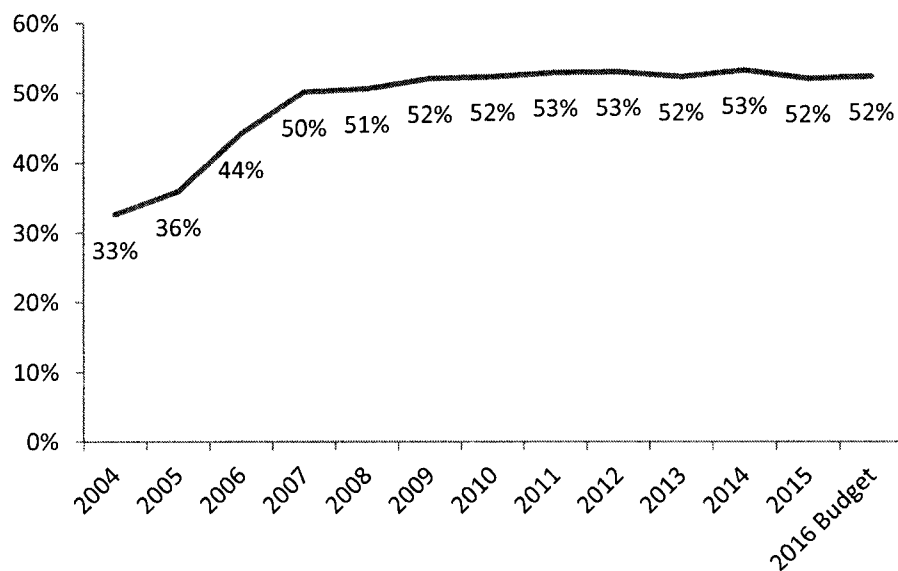
	2010 Actual	2011 Actual	2012 Actual	2013 Actual	2014 Actual	2015 Actual	2016 Budget
Ajax	31,198	32,308	33,021	33,640	34,229	34,837	35,610
Brock	4,585	4,622	4,702	4,710	4,722	4,727	4,760
Clarington	27,847	28,465	29,106	29,678	30,218	30,922	31,580
Oshawa	45,228	45,523	46,188	46,645	47,230	47,897	48,450
Pickering	25,458	25,811	25,969	26,194	26,406	26,848	27,135
Scugog	7,927	8,002	8,187	8,194	8,206	8,216	8,280
Uxbridge	6,860	6,938	7,085	7,095	7,125	7,171	7,240
Whitby	36,323	36,859	37,647	37,987	38,262	38,518	38,970
Total	185,426	188,528	191,905	194,143	196,398	199,136	202,025

- 2.2 Overall, tonnages and stop count growth rates are lower in recent years with some reduction in expenditure pressures. Reduced tonnages are a result of product stewardship return-to-retail programs, curbside scavenging, industry packaging reductions, slower economic growth, and lowered tonnage but higher volumes of waste being generated per household.

3. Diversion Data and Solid Waste Management Performance Measures

- 3.1 The following graph provides the actual diversion rates for 2004-2015 and projection for 2016.

Graph 3
Durham Region WDO Diversion Rate
(2004 to 2015 Actuals, and 2016 budgeted)



- 3.2 The most significant diversion increases occurred between 2004 and 2009, with significant expansions due to the introduction of the Green Bin program and subsequent expansions to Blue Box program materials and diversion collection programs. The overall diversion rate remained at 50 per cent – 53 per cent since 2007 despite the drop in blue box material tonnage, as this has been offset from higher yard waste tonnage and reuse and C&D material tonnage.
- 3.3 The focus of diversion on a go-forward basis will be the organics waste stream, which studies demonstrate does remain a significant portion of the residual garbage stream destined for the new DYEC. Recommendations are made, as described within, to both address the limited capacity available for organics processing, and to implement enhanced organics and recycling programs (residential and multi-residential) through a comprehensive and long-term organics management plan. More detailed technical and financial study and

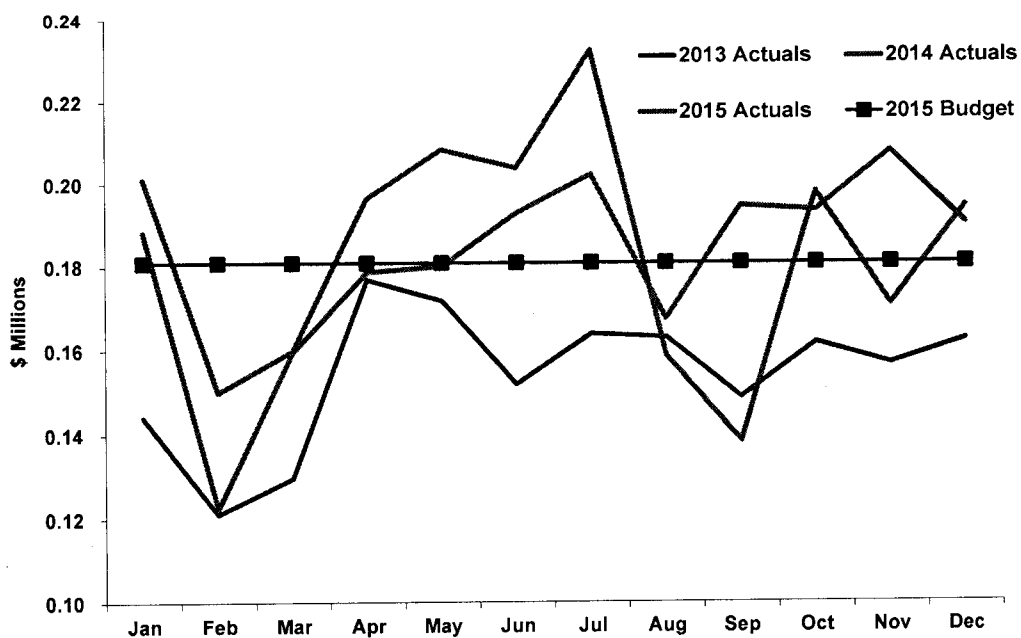
business case analysis is recommended as the next step towards the potential implementation of organics pre-sort technology which could provide suitable feed stock to support operation of a potential future AD type technology. Proposed detailed studies are consistent with current Regional Council direction, and will include analysis of technology, transfer and processing logistics, financial and market feasibility, and existing potential for partnerships, both public and private.

- 3.4 Once programs are implemented, performance is monitored, measured and evaluated. Performance measurement results for Durham Region are included in Appendix 3.

4. Commodity Revenues

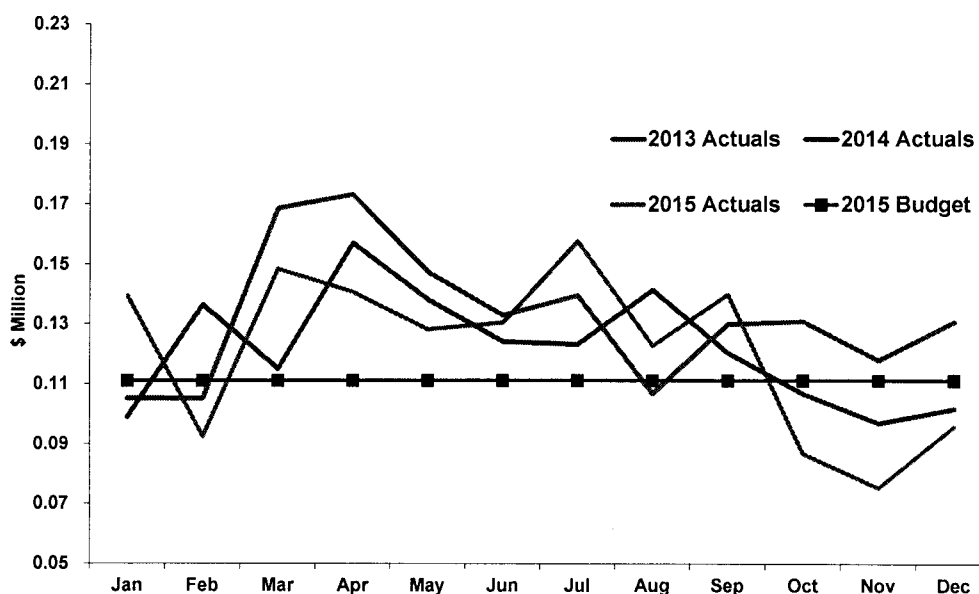
- 4.1 Recyclable materials revenues fluctuate based upon market prices which are tied directly to the health of commodity markets, including metals, plastics, and paper fibres markets. Budget to actual price variances and tonnage variances are tracked and assessed continuously.
- 4.2 The Region has seen annual total recycling revenue highs totaling \$7.8 million and lows of \$3.9 million in 2013 which resulted \$1.2 million lower than budgeted. The 2015 Budget for commodity revenues was set at \$5.0 million. Including data to November 2015, a \$50,000 deficit in the Blue Box revenue program is anticipated for 2015. Regional staff continues to monitor actuals as part of the 2016 Business Planning process.
- 4.3 The following charts demonstrate actual monthly fluctuations in market revenues for fibres, plastics and metals during 2013, 2014 and 2015.

**Graph 4
Fibres Monthly Revenue
(2013 to 2015 Actuals and 2015 Budget)**



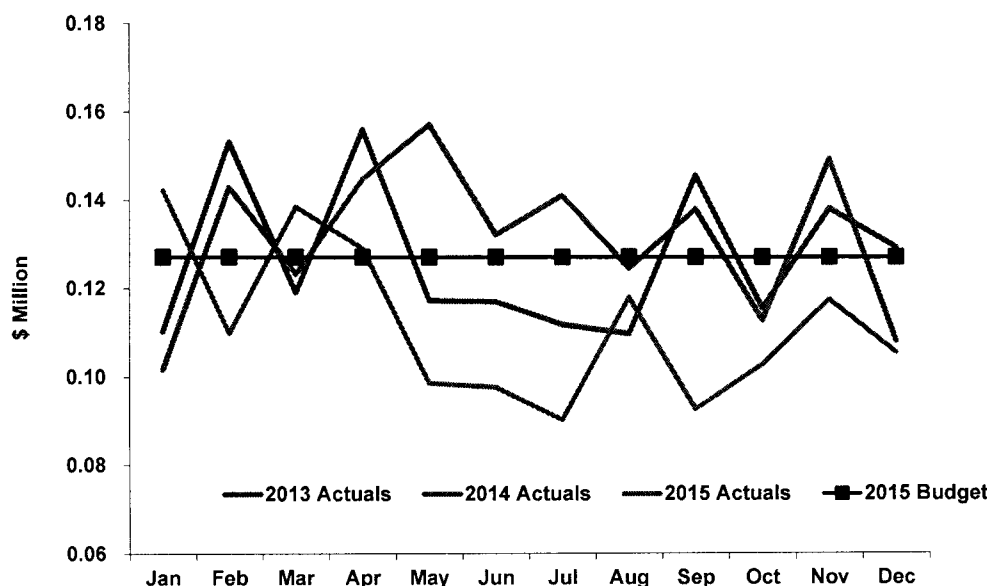
- 4.4 As the chart above demonstrates, the fibres market fluctuates throughout the year, however for the total year, the results for 2015 were similar to 2014. Recycled paper markets industry analysts predict continued volatility (potential lows and highs) based on steady growth and increased calls for recycled content in regards to container board and towel and tissue markets, offset by reductions due to a structural shift away from newsprint, printing and writing grades of paper.

Graph 5
Plastics Monthly Revenue
(2013 to 2015 Actuals and 2015 Budget)



- 4.5 Volatility in plastics markets is also significant. However, an additional factor influencing the Solid Waste Management operations budget is Durham's significant proportion of mixed plastics, which are currently garnering a lower price due to increased market supply, increased vigilance in foreign markets accepting these materials and significantly lower price of oil.

Graph 6
Metals Monthly Revenue
(2013 to 2015 Actuals and 2015 Budget)



- 4.6 Plastics and metals are also affected by industry light-weighting of packaging materials. Light-weighting of products and packaging, combined with the low price of oil and reduced demand for raw materials has decreased demand for recycled content, lowered market prices and is decreasing the weight of Region's materials tonnages available for sale. Lowered materials tonnages contribute to the negative impacts on the Region's Blue Box revenues, although reductions are expected to level off at some point and eventually be offset by growth in tonnages due to population growth and increased economic activity.

5. Regulatory Uncertainty and Restructuring: Bill 151 Waste-Free Ontario Act

- 5.1 On November 26, 2015, the Ministry of the Environment and Climate Change (MOECC) introduced Bill 151, *The Waste-Free Ontario Act* and a draft "Strategy for a Waste-Free Ontario: Building the Circular Economy."
- 5.2 The proposed Act and draft Strategy are high level, enabling legislation that outlines the principles to be applied in future regulations affecting responsibilities and funding for designated waste management materials, including Blue Box and MHSW. The companion report included within this agenda includes an update and provincial feedback recommended by Regional staff (Report #2016-J-6). Staff continue to work with the Provincial government and related stakeholders in this sphere and will report back to Regional Council on new legislation as it develops, with any implications for Regional waste programs and funding. The transition to the new framework is anticipated to take between three and five years, although details will be released subsequent to the legislation being passed.

6. 2016 Priorities and Pressures

DYEC Start-up, Testing and Commercial Operations

- 6.1 The transition from facility testing protocols to full commercial operations, as defined within the Project Agreement, is progressing and the DYEC is anticipated to be fully operational in early February, 2016.

Table 3
DYEC Operating Costs (2016-2021) ⁽¹⁾

	(\$ millions)					
	2016	2017	2018	2019	2020	2021
<u>Durham EFW Budget</u>						
Durham Inspection and Haulage to EFW (based on existing contract) ⁽²⁾	2.78	2.88	2.98	3.08	3.18	3.29
Covanta Operating Fee (Durham/York) ⁽³⁾	16.15	16.51	16.88	17.26	17.65	18.06
Property Taxes	1.07	1.07	1.07	1.07	1.07	1.07
York Recovery ⁽⁴⁾	(3.68)	(3.76)	(3.84)	(3.92)	(4.01)	(4.09)
Other EFW Project Operating Costs (gross costs including Facilities) ⁽⁵⁾	1.35	1.26	1.26	1.17	1.07	0.98
York Recovery ⁽⁶⁾	(0.28)	(0.26)	(0.27)	(0.25)	(0.22)	(0.20)
<u>Sub-total EFW Project Operations Costs</u>	17.38	17.68	18.08	18.41	18.74	19.10
<u>DURHAM ONLY EFW OPERATING REVENUES</u>						
EFW Electricity Revenues (OPA/IESO) ⁽⁷⁾	(6.99)	(7.04)	(7.08)	(7.13)	(7.17)	(7.22)
EFW Materials Recovery Revenues ⁽⁸⁾	(0.57)	(0.58)	(0.59)	(0.61)	(0.62)	(0.63)
<u>Sub-total EFW Operating Revenues</u>	(7.57)	(7.62)	(7.68)	(7.73)	(7.79)	(7.85)
<u>DYEC NET COST (DURHAM ONLY)</u>	9.81	10.06	10.40	10.67	10.95	11.25

Notes:

1. Includes estimated HST.
2. Includes inspection fee and haulage to DYEC (Miller contract).
3. Assumes 100% Covanta fee.
4. Assumes York tonnages to DYEC at 30,000 tonnes.
5. Includes non-Covanta costs borne by the Owners, including weigh scale operations, staffing, communications, advisory committees, Council directed emissions monitoring, consulting and off-site maintenance (HCA).
6. York share 21.4% with the exception of Durham only communications material costs.
7. Electricity revenues are assumed at Power Purchase Agreement price escalated based on agreement, and totaling 8.29 cents per kWh per tonne.
8. Assumes ferrous and non-ferrous revenues which commence at commercial operations.

Clarington Municipal Hazardous and Special Waste (MHSW) Facility by 2017

- 6.2 Durham Region is recognized as a leader in diverting MHSW from the waste stream. The executed DYEC Host Community Agreement includes a Regional commitment to establish a Regional MHSW facility in the Municipality of Clarington within one year of commencement of commercial operations. It is recommended herein that staff issue a Request for Proposal (RFP) for a consultant to identify capital, design, regulatory, costing requirements and service

delivery options for a new Clarington MHSW facility to be located at the Regionally-owned property at Regional Road #57 and Highway #2, at a consulting cost not to exceed \$0.1 million to be funded from the 2016 Solid Waste Management Operations Budget.

- 6.3 An additional \$0.9 million is included in the 2016 Solid Waste Management Budget for upgrades and modifications to the sites once the plans and service delivery options are approved by Regional Council in late spring 2016.
- 6.4 As previously reported, Regional staff will also consider future opportunities to expand the future Clarington MHSW facility beyond the collection of hazardous waste, to act as a potential site for a full-scale eco-station. An eco-station is a facility designed for the collection of divertible materials (such as tires, waste electronics and reusable materials), excluding any residual waste (or garbage) drop off.
- 6.5 A future report to Joint Committee will provide an assessment of eco-station options and costing and recommendations, including business case, and considering diversion potential and any impacts from the proposed legislation under Bill 151, the *'Waste-Free Ontario Act'*, which could significantly affect options and potential costing and revenues.

2016 Proposed Pilots: C&D and Bulky Rigid Plastics

- 6.6 In 2014, Regional staff began to investigate potential options, and implications of a diversion program for small scale renovation, construction and demolition waste materials (C&D) from the Region's Waste Management Facilities (WMFs). C&D materials make up approximately 6,750 tonnes, or approximately 25 per cent of the 27,000 tonnes of materials collected annually at the Region's three WMFs.
- 6.7 In 2015, a one year pilot project contract was awarded with a potential additional one year extension, for the haulage and processing of mixed residential construction and demolition (C&D) material from the Region's Waste Management Facilities (WMFs). The pilot contract was awarded to Durham Disposal Services Ltd. operated under Index Environmental Corporation and commenced on October 13th at the Oshawa WMF. From mid-October 2015 until the end of November 2015, approximately 241 tonnes of mixed C&D was diverted and processed. It is estimated a program to divert these materials from disposal could result in approximately a one per cent increase in Durham's diversion rate on an annualized basis and reduce the more- difficult-to-combust materials at the DYEC.
- 6.8 The objective of the pilot is to gain insight into the composition of the mixed C&D material received at the WMF's and more importantly, divert non-combustible waste from the DYEC. In 2016 the pilot will continue to be monitored and potentially expanded to the other WMF in Scugog and Brock. Upon the pilot's completion, Regional staff will report back to Regional Council.

6.9 In addition, Regional staff were authorized in 2015 to investigate the feasibility of collecting and marketing bulky rigid plastics (BRP). The objective was to gather information on recycling markets for BRP and identify opportunities. BRP include, but are not limited to, the following materials:

- (a) Plastic buckets and pails – all sizes
- (b) Plastic crates and trays (milk/soda/bread) and laundry baskets
- (c) Plastic lawn furniture
- (d) Plastic pots
- (e) Plastic toys, playhouses, totes and tool cases
- (f) Plastic reusable storage containers

6.10 BRP are not currently accepted in the Region's curbside Blue Box collection program (not a provincially-mandated Blue Box item) or for recycling through the Region's Waste Management Facilities (WMFs). It is estimated that a BRP recycling program could capture approximately 200 tonnes of material per year.

6.11 Staff will continue investigating potential end markets and collection and processing options for developing a BRP recycling program in 2016 as well as any implications with the proposed new provincial Waste-Free Ontario Act legislation and will report back on any proposed next steps.

7. Forecast Expenditure Pressures: Preliminary Capital Forecast (2016-2025)

7.1 Significant expenditure and revenue pressures over the forecast period in the area of Solid Waste Management include:

- A) Maintenance of existing solid waste program assets;
- B) Continued movement towards the 70 per cent diversion target;
- C) Avoidance of future disposal capacity expansions;
- D) Landfill risk management, remediation and closure plans and their perpetual monitoring and care to ensure continued environmental protection; and,
- E) Capital requirements over the forecast period.

7.2 The following table provides the proposed 10-year capital forecast (2016 to 2025) and remains subject to 2016 Regional Council approvals.

Table 4
Preliminary Solid Waste Management Major Capital Forecast (\$ Millions)⁽¹⁾⁽²⁾

	<u>Proposed</u> 2016	2017	2018	<u>Forecast</u> 2019	2020	2021- 2025	<u>Total</u> 2016- 2025
Landfill remediation/reclamation	-	0.5	1.5	1.1	0.3	1.3	4.7
Waste Transfer Facility with organics pre-sort technology	-	7.0	6.0	-	-	-	13.0
Clarington MHSW ⁽³⁾	1.0	-	-	-	-	-	1.0
Eco-Reuse Diversion	-	-	-	0.6	3.2	5.2	9.0
Organics Plan Capital/AD	0.4	30.0	-	-	-	-	30.4
Seaton Facility	-	-	-	-	8.5	-	8.5
Total Capital	1.4	37.5	7.5	1.7	12.0	6.5	66.6

Notes:

(1) Capital projections are subject to further review and business case analyses as required per Regional Council direction related to eco-station development, waste transfer facilities and equipment, landfill mining, and anaerobic digestion. Required capital may include public or private partnerships and/or grants and will be identified by required business cases as part of project approvals.

(2) May be impacted by proposed Provincial legislation

(3) Includes \$0.1 million in consulting fees and \$0.9 million for construction.

Anaerobic Digestion and Pre-sort Technology at Point of Transfer

7.3 Major projects include the investigation of Anaerobic Digestion (AD) and pre-sort technologies employed at a centralized transfer facility to expand processing capacity and extract increased organics out of the solid waste stream. The Region is approaching organic processing capacity limits which constrain diversion plans necessary to achieve 70 per cent diversion. Expanded organics capacity through AD and pre-sort technologies would allow the extraction of organics from both single family households and the multi-residential residual stream, and significantly increase Durham Region's diversion rate. Additional operations and/or capital investments may be required to facilitate this expansion.

7.4 Durham's Green Bin program currently accepts all food wastes, household plant clippings, paper fibre wastes, and potting soils. The residual waste stream also includes uncaptured Green Bin organics and organic materials that are not suitable for the Region's existing Green Bin program because of health and safety issues, lowered compost quality and processing constraints. These materials

include pet waste, diapers, sanitary and incontinence products. A comprehensive waste composition analysis of multi-residential households in Durham Region, that included different local municipalities, determined that the multi-residential waste stream is comprised of up to 50 per cent organic materials, which could potentially be diverted through AD. The aerobic composting technology the Region currently uses for its Green Bin program is unable to properly process these materials and staff is currently analyzing potential to divert these organics through AD.

- 7.5 Staff has explored options to use AD technology to process organic materials while producing energy and beneficial products. Kelleher Environmental Inc. was retained in 2012 to complete a technical review and an options analysis of AD technologies for the Region of Durham (the Kelleher Report). That report confirmed that AD technology could provide a processing solution to expand its current organics program to include more problematic materials and to introduce source separated organics collection to the Region's multi-residential sector.
- 7.6 Staff built on the findings of the Kelleher Report and retained the services of HDR Corporation to conduct initial technical feasibility and due diligence analysis of available technologies that could potentially deliver more comprehensive organics processing beyond the current forecast. This investigation concluded that AD and pre-sort technologies have reached a maturity level that ensures its reliability to meet Durham's needs and that Durham generates sufficient organic waste to support an AD facility.
- 7.7 It is recommended herein that Regional staff be authorized to issue an RFP to obtain financial and technical advisors with adequate knowledge of business case, risk and service delivery analysis (at an estimated cost of \$0.4 million to be funded from the 2016 Solid Waste Management Operations Budget with a report back to Joint Committee in the spring of 2016 to award the tender) to:
 - a. Conduct an options analysis, including reviewing existing studies, to confirm that AD is the best organics management option for the Region;
 - b. Subject to a favourable AD options analysis, recommend the preferred business model based on the evaluation of a combination of criteria to include, but not be limited to, most effective and efficient source material transfer options, highest diversion potential, highest value of fuel and other outputs, lowest net costs and potential budgetary and property tax implications to the Region;
 - c. Assist the Region to issue a Request for Quotations (RFQ) to solicit potential project partner(s) based on the criteria outlined above;
 - d. Assist the Region in evaluating the RFQ and negotiating any necessary partnership requirements with the successful project partner; and

- e. Assist the Region and its project partner to issue a procurement process based on the criteria outlined above to secure the preferred AD and associated material transfer and pre-processing option for the Region.

Transfer Station Analysis

7.8 At its meeting of November 28, 2013, the Joint Finance & Administration Committee considered options to demolish the existing facility at 4600 Garrard Road and construct a new purpose-built centralized transfer facility under either a design-build or design-build-operate approach, at an estimated cost of approximately \$7.0 million (Report #2013-J-38). The recommendations were as follows:

- a) That based upon the AECOM Inc. study "Waste Optimization Study for 4600 Garrard Road" and business case analysis in Joint Report #2013-J-38, a Request for Proposals (RFP) be issued seeking options to demolish the existing facility at 4600 Garrard Road (old recycling centre site north of the new materials recovery facility) and construct a new purpose-built centralized transfer facility under either a design-build or design-build-operate approach, at an estimated capital cost of approximately \$7.0 million, including site works and cost escalation contingency to:
 - i) Receive, process and distribute the Region's co-collected curbside source separated organics, Blue Box, and residual garbage waste materials, including compliance with stringent residual waste flow and control requirements, as dictated by the Ministry of Environment through the Durham-York Energy Centre Environmental Assessment and Certificate of Approval;
 - ii) Concurrent with the recommendations to award the Request for Proposals, related financing and the preferred service delivery approach for the centralized transfer facility capital project also be recommended.

7.9 The Committee referred the recommendation back to staff with a recommendation to expand the review to include all options including more than one particular site.

7.10 Staff continues to review and consider all transfer station options as part of the detailed investigations regarding organics pre-sort and potential for AD technology and, following determination of a prudent long-term organics plan, a report with recommendations will be brought back to Regional Council per current direction. Any implications due to changing Provincial diversion programs will also need to be considered.

Landfill Remediation and Perpetual Care

7.11 The 2013 Post Closure Care Plan for the Oshawa Landfill recommended an evolutionary approach to site maintenance activities that considers implementing low cost bio-remediation options before moving onto more expensive engineering

solutions as necessary. Maintenance issues at the site include erosion and slope stability along the Oshawa Creek, the acquisition of buffer lands, landfill cover maintenance and the addition of more groundwater monitoring stations. The report's findings and recommendations are being used as a guide to plan maintenance activities and capital projects.

- 7.12 A major project was undertaken to address slope stability and aesthetic issues along a specific section of the Oshawa Creek in 2015. This project involved re-grading of an embankment to reduce the steepness of its slope, creation of a filter bed system, stream diversion, and installation of a compost "sock" system to stabilize the slope and provide a medium for vegetative growth to add further stability. Staff will monitor the success of this project in terms of its suitability for use elsewhere on the site where erosion issues occur. Consideration of alternative erosion control methods for other areas of the site may also be necessary depending on the topography of the target areas.
- 7.13 In addition to working with the City of Oshawa to acquire buffer land on the western boundary of the landfill, staff also investigated the acquisition of land from Camp Samac along the northern boundary of the site. A survey was completed for all of the adjacent properties to acquire appraisals to enter into negotiations for the appropriate portions of the property to allow access/buffer areas. These activities were funded from the Waste Management Operating Budget based on approvals in 2015 (Report #2015-J-8).
- 7.14 Monitoring of landfill gas, groundwater, and surface water continued in 2015. Region staff has been investigating sources of soil for the cover maintenance requirements to fill in low lying areas of landfill cover. Cover maintenance work is planned over the next few years. Completion of the decommissioning of the ineffective active gas collection system, first installed in 1980, is expected to occur in 2016. Capital funding in the amount of \$1.5 million for all of the Oshawa Landfill maintenance work was approved in the 2013 Solid Waste Management Servicing and Financing Study.

Blackstock Landfill Mining Project

- 7.15 Landfill mining typically involves the separation and removal of excess soil and recyclable metal from the waste fill area to increase the space within the landfill footprint for the disposal of more waste. However, the proposed mining project at the Blackstock landfill is being undertaken as a restorative project and involves the removal of non-hazardous waste from the site for potential processing at the DYEC, and the removal of metal for recycling. The excavated soil would be used as backfill and the site would be graded and covered with hydro-seed to establish a natural vegetated cover.
- 7.16 In October 2010, Golder Associates Ltd. (Golder) completed a Landfill Reclamation Assessment to evaluate the economic and technical feasibility of landfill mining at the Region's landfill sites, including a review of potential costs

and impacts. The Blackstock Landfill site, a small Regionally owned inactive site located in the Township of Scugog, was identified as a preferred location to conduct a landfill mining project as a test for potential mining projects at larger former landfill sites located closer to urban residential areas.

- 7.17 The Ministry of Environment and Climate Change has recommended that the most effective way to have the mining project approved is for the Region to complete a Closure Plan for the site with landfill mining as the major remedial component of the plan. Approval for the landfill closure plan is obtained through an application for an amendment to the site's Environmental Compliance Approval (ECA).
- 7.18 A RFP to solicit the services of an engineering firm familiar with landfill mining work was issued in September 2015, which resulted in retainment of the services of Golder (Report #2015-WR-5). Golder is preparing the application to amend the ECA for submission to MOECC; preparing contract drawings and specifications for a subsequent construction tender; and will provide construction oversight. Approval for the closure plan and landfill mining would be added as a condition to the ECA. Once Ministry approval for the closure plan is added to the ECA, the Region will be legally obligated to complete the landfill mining project.
- 7.19 Pending Ministry approval, staff will issue a construction tender to solicit the services of a general contractor to perform the landfill mining work. The mined waste would be processed at the DYEC for energy recovery and recyclables marketed, if possible. The excavated soil would be used as backfill and the site would be graded and covered with hydro-seed to establish a natural cover. Groundwater monitoring would continue for a few years to demonstrate the positive environmental benefits of this project.

Asset Management

- 7.20 Challenges are apparent with respect to ensuring adequate funding for the Region's expanding infrastructure assets over time, including ongoing life-cycle capital replacement and repair requirements as waste infrastructure ages or is decommissioned and replaced. Capital-related annual operations and maintenance costs and financing are also part of long-term financial planning considerations. Asset management planning must also consider the timing of investments and capital and rehabilitation costs over the life-cycle of an asset. Thought must also be given to the future impacts from those assets requiring replacement over a similarly short span of time in the future. Balancing out investment timing assists in ensuring affordable capital investments over the forecast period, as well as affordable maintenance and replacement schedules in the future.

- 7.21 Building Condition Assessments (BCA's) have been undertaken on each of the Region's waste management facilities. These assessments included visual inspections to evaluate the current state of each asset and identify capital work and associated costs potentially required over the next 25 years to maintain these assets in a state of good repair.

Development Charges

- 7.22 Development Charge (DC) Act changes under Bill 73 are also being carefully reviewed by Regional staff and future recommendations will be made with regard to proceeding with a Regional DC to provide funding for growth related capital included in the 10 year capital program.

8. Climate Change Considerations

- 8.1 Municipal Solid Waste Management programs are recognized as key contributors to achievement of a low carbon society. The purpose of municipal solid waste management is to divert materials out of the residual solid waste stream for re-use, recycling and composting. Re-using and recycling materials is far less energy and carbon-intensive than the production of comparable materials from virgin sources. Municipal programs result in significant reductions to Ontario carbon emissions by minimizing the amount of waste sent to landfills. This is accomplished through a multitude of programs including: re-use programs; Blue Box recycling; organics composting, resident education programs; and solid waste energy recovery.
- 8.2 EFW technology is recognized internationally as an effective carbon mitigation tool:
- EFW facilities produce electricity for sale to the grid, which offsets higher GHG-emitting fossil fuel combustion sources;
 - EFW facilities, built locally as a solution to post-diversion residual solid waste disposal, allow a municipality to avoid long-distance truck haulage of residual waste to distant landfills, with reductions in GHG emissions due to haulage;
 - EFW technology produces lower overall carbon emissions than landfilling options; and,
 - EFW-related processes assist in recovering additional metals for recycling, which further reduces carbon emissions associated with the production of metals from raw materials.
- 8.3 Based upon the Region's carbon footprint, it is estimated that GHG emissions from the Waste Management Division represent just over 40 per cent per cent of corporate emissions, primarily due to stewardship of seven closed landfills, which account for almost the entire Solid Waste management emissions. Combustion of fuels and energy usage at waste facilities accounts for less than 1 per cent of total estimated program emissions (based on 2012 estimates in Report #2013-J-25).

- 8.4 In terms of broader GHG emissions beyond corporate emissions, reductions to truck haulage emissions by private contractors have come from the adoption of lower carbon fleets with higher fuel efficiencies, waste collection route efficiencies and the closer proximity of the DYEC versus longer haulage distances to New York and Michigan landfill prior to 2015. It is hoped that current studies of AD technology and enhanced organics diversion will lead to significantly greater GHG reductions.
- 8.5 On April 13, 2015 Ontario Premier Kathleen Wynne announced the intention to establish a Cap and Trade system for carbon emissions in Ontario, as the primary tool to achieve Ontario's 2020 GHG emissions target of 15 per cent below 1990 emission levels. The Provincial government emphasizes a role for waste disposal as an approach to reducing carbon emissions with electricity generation as a by-product of the process. The Region responded to provincial Cap and Trade design options through EBR posting 012-5666 (Report #2015-F-86) and draft regulation is anticipated to be released in 2016.
- 8.6 The proposed Cap and Trade program is currently considering EFW facilities such as the DYEC, but is anticipated to exclude landfills. The Region has submitted letters to the Ministers of Environment and Climate Change, Energy, Municipal Affairs and Housing, Economic Development Employment and Infrastructure and their senior staff requesting that they recognize the importance of EFW as a GHG mitigation technology relative to landfill and Durham's significant investment in working with the MOECC to curb GHG emissions from waste disposal and waste exports, scientific research, and follow other jurisdictions such as California and Quebec and not include EFW in Ontario's proposed Cap and Trade program.
- 8.7 In terms of climate adaptation and risk management, the solid waste environmental studies program is responsible for the monitoring, inspection, and remediation of former closed and still open Regional landfill sites, including consultations with the public and ensuring environmental protection which meets or exceeds regulatory compliance. Extreme precipitation significantly increases risks related to contamination migration. Adaptation-related activities include: inspections of former and active landfill sites; regular environmental monitoring and reporting; well-water testing adjacent to open and closed Regional landfill sites; and, undertaking any necessary repairs or improvements to protect the environment/ground water resources, including preventing rainfall infiltration and preventing leachate springs forming around landfills.

- 8.8 The Region has also completed investigations of alternative options for the remediation of the smaller Blackstock, Scugog and Scott landfills, including landfill mining feasibility studies. Landfill mining is considered an alternative to traditional options for leachate control, which include purchasing containment attenuation zones around closed landfills. In 2015, a pilot to landfill mine the Blackstock landfill was approved and will commence in 2016 at a cost of approximately \$1 million, subject to regulatory approvals. Should this endeavor be successful there will be climate adaptation co-benefits as reduced methane emissions will be coupled with reduced risks of leachate during extreme precipitation events.

9. Existing Program Updates

Re-Use Events

- 9.1 Reuse programs offered by the Region of Durham are in partnership with local charities. All partners in the reuse programs are registered under the Revenue Canada's non-profit charity designation. The partnership encourages residents to divert items from waste, including clothing, accessories, household items, tools, furniture, and construction and renovation material and by donating, support local charities. Funds received from resale of donated items at local thrift stores assist the organizations in the community to support residents in need.
- 9.2 The Waste Management Division provides textile collection programs at the three Waste Management Facilities in partnership with the Canadian Diabetes Association (CDA). This collection program has been offered for over 10 years through the CDA's red donation boxes located just after the weigh scale at each of the sites. In 2015, just over 30 tonnes of material was collected.
- 9.3 ReUse Days are recommended to be made permanent in 2016 with eight scheduled events on the third Saturday of each month beginning in March through to October. The events are held at the Waste Management Center in Whitby in partnership with four local charities; Habitat for Humanity Durham, CDA, Goodwill (the future of Goodwill is uncertain but will not have an impact on the Region to continue with reuse events), and Salvation Army. Total cost including staffing, printing and advertising to the Region for the eight events was \$23,792. In 2015, 19.4 tonnes of material was collected from 405 vehicles that visited the events. For the partnering charities, they calculate donations by \$1/pound. In 2015 this translated to just over \$42,715 in support of local charitable work in the community. In 2016, Reuse Day events are scheduled to again run monthly from March-October at the same location with these partners.
- 9.4 Waste audits of Durham's multi-residential sector completed in 2014 show that of the waste collected, 3 per cent included textiles and 17 per cent was small appliances, furniture and other reusable household items. This represents 3,760 tonnes, or 1.5 percent of overall diversion. To capitalize on this potential, staff proposes investigating options in 2016 and report back on the collection of textiles and household items for re-use from multi-residential properties that receive

Regional waste collection service. The proposed pilot project would include expanding on Durham's partnership with local charities to explore the financial implications, if any, the collection logistics, diversion potential, and a phase-in plan to effectively and efficiently assist residents to divert materials for re-use.

Curbside Battery Collection Program

- 9.5 Durham's curbside battery collection program continues to maximize the capture of batteries, while keeping mercury, cadmium, and other heavy metals out of the waste stream. Household batteries are actively managed in Ontario and recycled responsibly through proper processing and conservation of valuable resources.
- 9.6 Durham's battery processing vendor, Raw Materials Company (RMC), located in Port Colborne, Ontario, recovers the steel, zinc, manganese from each battery giving these materials another chance at life. They provide feedstock to the local steel industry and micro-nutrients to the local agricultural industry for biofuel crop production. RMC's battery recycling technology is capable of recycling and recovering up to 92 per cent of components found in spent household batteries.
- 9.7 The production and distribution of customized special purpose battery collection bags proved to be logistically and economically unsustainable, increasing costs significantly. This was addressed by providing bright orange stickers in the annual waste management calendars that residents peel and stick to their own sealable, transparent bags for collection, as well as printable online labels via durham.ca/battery.
- 9.8 Since the first battery collection in November 2012, it is estimated that Durham Region has diverted more than 100,000 kilograms (220,462 pounds) of household batteries from the waste stream. It has also served as a catalyst for curbside battery recycling in Ontario with over 60 municipalities starting their own programs or considering them. Durham Region is proud to have pioneered this successful diversion initiative. Waste staff will continue to engage, educate and promote the curbside battery collection program with our residents, including enhanced partnerships and messaging with the local Fire Departments in order to keep the program momentum trending upwards.
- 9.9 In 2016, two scheduled curbside battery collections will occur during the weeks of April 18 to 22 and November 7 to 11. Details are posted on the Region's web site and the Durham Region Waste Application and will be shared with social media channels.

Multi-Residential Waste Collection and Diversion

9.10 In 2015, the Region provided waste management services to 381 multi-residential properties which encompass 24,669 household units. This represents an increase of 10 buildings and 785 units over 2014. Waste collection and recycling service to multi-residential properties is provided under three separate collection contracts: two that are part of the curbside collection program and one that involves recycling cart collection.

9.11 The majority of existing multi-residential properties in the Municipality of Clarington receive private solid waste collection services. In 2015, staff received applications for municipal waste collection services from several of these properties and is reviewing them for compliance with the Region's Technical and Risk Management Guidelines for Waste Collection Services on Private Property. Based on the reviews to date, approximately six buildings, representing 500 dwelling units may be eligible to start receiving municipal waste collection services in 2016. This is not new growth to the Region but represents an expansion of the Region's multi-residential services which will be funded from the 2016 Solid Waste Budgets and Business Plans. Staff will monitor further requests for municipal multi-residential waste collection from existing properties and will recommend any necessary adjustments to the 2017 Solid Waste Management Budgets and Business Plan. The addition of multi-residential buildings to regional waste collection services negatively impacts diversion rates as this sector continues to underperform with recycling capture rates and lack of organics recovery programs.

9.12 In 2015, expansion of the multi-residential battery collection program occurred in Uxbridge and Oshawa. A total of 96 sites are now receiving battery collection service at their buildings. Since starting this program 1,831 pounds of batteries have been collected. The program is offered to buildings on a case-by-case basis. In 2016, further expansion of the battery program will continue to multi-residential properties that meet Regional requirements, including those for onsite supervision and internal central storage.

9.13 Multi-residential sector residents generate Municipal Hazardous and Special Waste (MHSW) but, a significant number of residents in the multi-residential sector do not access the Region's waste management facilities or the seasonal MHSW collection events. In 2016, staff proposes to investigate opportunities to provide a cost neutral MHSW collection service event, onsite, to a select high density multi-residential complex that receives municipal waste collection and to report back on a proposed pilot program.

Community Outreach

9.14 Regular and consistent information on waste management programs is critical to maintaining and improving public awareness and participation and increasing the waste diversion rate.

9.15 In 2015, the Region continued to actively promote its waste diversion programs through an extensive communication and education program, the main objectives of which included promoting and encouraging correct participation in waste diversion programs and promoting an understanding of, and compliance with the Waste Management By-law 46-2011 as amended.

9.16 Highlights of events and activities that took place in 2015 include:

- Eight spring compost events, one in each municipality.
- Eight special electronic equipment drop-off events were held and promoted throughout the year in each municipality.
- Four municipal hazardous and special waste drop-off events.
- Eight reuse drop-off events were held between March to October, partnering with local charities.
- Promotion of waste diversion programs during National Public Works Week.
- Waste Fair held in the City of Pickering. This free, family-friendly event focused on educating residents about responsible waste management.
- Durham Region celebrated "Waste Reduction Week" in October promoting waste reduction and diversion options for residents.
- "Durham Works", the Works Department's external newsletter was distributed twice to 210,000 households in the Region. It featured information on the Green Bin and Blue Box Programs, curbside battery collection, programs offered at the Waste Management Facilities and updates on the DYEC.

9.17 The outreach program, in collaboration with the school boards, addresses curriculum based education that relates to waste management and the environment. Students continue to have the opportunity to be educated on the Region's waste management programs through the Region's association with the school boards. The DYEC Education Centre will also provide new opportunities to host students and the public as part of the education programming related to Solid Waste Management.

9.18 A pilot school education project is being undertaken in partnership with Clearesult and Veridian Connections. The pilot aims to elevate the importance of integrated waste management at the grade five level. This subject matter will connect waste management and energy conservation and provide teachers with lesson plans that address waste reduction and conservation. Students will receive take home kits that will include items for use at home which could affect behavioral changes with respect to household waste reduction habits and water and energy conservation. As part of the pilot, students will attend a field trip that will include the DYEC. Funding for the pilot project will be provided through an Independent Electricity System Operator (IESO) grant.

9.19 In August 2015, the Region held its fourth community Waste Fair in the City of Pickering. Approximately 400 residents attended and the feedback received (written and verbal) was very positive. The Waste Fair is a one-day free, family-friendly event which is held in a different Durham Region community every year.

It focuses on educating the public about responsible waste management and services provided by the Region and includes:

- Staffed educational displays about the Region's waste management programs and waste facilities, including the DYEC;
- Interactive and educational displays by the Region's waste management partners; and,
- Eco-friendly crafts and entertainment geared to families.

9.20 As a condition of the Environmental Assessment for the DYEC, the Community Communications Plan requires the Region to hold a public meeting between six and twelve months of the initial receipt of non-hazardous municipal solid waste at the DYEC (February 9, 2015). This public meeting is currently scheduled at the DYEC in February 2016 and will include staff members from Durham and York Regions, as well as HDR and Covanta, who will update the public on the DYEC and the Region's other waste management programs.

Mobile Smartphone Application

9.21 In 2015, the Region entered into a subscription agreement with ReCollect for a dedicated waste management application for smartphones (iPhones and Androids). The agreement was effective January 1, 2015 and was extended to December 31, 2016. The application was officially launched in September 2015.

9.22 The easy to navigate mobile application provides residents with instant and customized access to information about the various waste programs and includes multiple language capabilities. Blackberry does not have a platform to support the application. However Blackberry users can access the application functions through the Region's Waste Management website.

9.23 Key features of the smartphone application include:

- A personalized collection day calendar for garbage, Green Bin, Blue Box, yard waste and other special curbside collections (such as household batteries and Christmas trees);
- Sign up for collection day reminder notifications to pop up on your smartphone or tablet;
- The "*Know Before You Throw*" tool allows users to search waste items to discover proper disposal methods;
- Information on how to schedule special waste collection for bulky or porcelain items;
- The ability to report collection issues directly through the application (including a photo upload function);
- Mapping function to find Waste Management Facilities;
- One-touch ability to telephone a Waste Management Facility from the application; and

- The ability for the Region to distribute important notifications (eg. service delays/disruptions, public service announcements, emergency notices, etc.) to users broadly or in specific waste collection areas.
- 9.24 For the first time, Durham Region can communicate in a way many residents prefer which aligns with the Region's customer service focus. The application has allowed Durham to leverage technology to improve accessibility for residents and data management and analytics, accessibility and operational efficiencies for the region. At the writing of this report, the Region has over 12,000 users since the launch, and downloads are growing.
- 9.25 In 2016, staff proposes enhancing the application with functionality for booking special curbside collections of bulky items, porcelain bathroom fixtures and waste electrical and electronic waste. The special collection booking tool will provide users an easy and intuitive way to schedule special collections, and includes confirmation notifications, instructions and reminders of their special collection, so users know how and when to set their waste out for collection.
- 9.26 In 2015, the Waste Management Call Centre received 37,643 calls with over 18,500 related to special collections bookings. Improving customer service and reducing call wait times in an environment of rapid population growth with access to technology, without increasing staffing or telephony resources, is a priority for the Waste Management Division.
- 9.27 Waste Management will amend its annual subscription with Recollect in 2016 to include the special collections booking tool at an annual cost of \$6,000 to be funded from the Solid Waste Management Operations Budget.

Collection

- 9.28 The Region currently has three major curbside collection contracts. Two of these contracts cover collection services for Garbage, Blue Box, Green Bin organics and combined scrap metal, porcelain, and waste electronic programs within six of the eight area municipalities (an Ajax/Pickering contract and a contract for Clarington, Brock, Scugog and Uxbridge).
- 9.29 The third Regional curbside collection contract is for the collection of Blue Box materials only in the City of Oshawa and the Town of Whitby. The City of Oshawa and the Town of Whitby employ their own forces to provide all other waste collection services within their municipalities.
- 9.30 The Ajax/Pickering curbside collection service was retendered in 2014 with the new contract commenced on July 1, 2015 and represents a cost savings of approximately \$0.5 million in 2015 or \$1 million annualized.
- 9.31 The Oshawa/Whitby curbside Blue box recycling contract was retendered in 2015 with Tender T-304-2015. The due diligence review is still ongoing at the printing of this report. The new contract will be awarded to commence July 1, 2016.

- 9.32 The curbside collection contract for Clarington, Brock, Scugog and Uxbridge will be tendered in 2017 for collection services in 2018.
- 9.33 Contract T-335-2007 for the processing of Christmas tree, leaf and yardwaste expired on June 30, 2015 and was retendered. Courtice Auto Wreckers was the lowest bidder. The timing for the proper review and award of a new contract required an interim processor to prevent uninterrupted service. The Region's Purchasing By-law 68-2000 (Amended), Section 11.0 authorizes staff to make emergency purchases under certain circumstances. In accordance with Section 11.0, an immediate purchase can be expedited to prevent serious delays in the work of any department which might involve danger to life, damage to property, or the provision of an essential service. An emergency short term contract was entered into with Courtice Auto Wreckers from July 1, 2015 to August 21, 2015 to process Christmas trees and leaf and yardwaste at a cost of \$153,366, exclusive of taxes. Contract C002462 was awarded to the next lowest bidder, Miller Composting, effective August 24, 2015 for a period of three years with the option for two additional one year terms.

Special Collection Events

- 9.34 In 2015, eight Compost Give Away events, five Municipal Hazardous and Special Waste (MHSW) collection events and eight Waste Electrical and Electronic Equipment (WEEE) collection events were managed across the Region. The MHSW collection events diverted 24 tonnes from the waste stream while the WEEE collection events diverted 29 tonnes of end-of-life electronics for recycling. Together, residents diverted 53 tonnes from 1,932 participating vehicles.
- 9.35 The spring Compost Give Away events are held in combination with blue box, green bin, and backyard composter sales and exchanges, with any remaining compost made available to local area municipalities to use on public gardens and parks. These events continue to be well received with the public as 4,565 vehicles attended.
- 9.36 Looking forward, the quantity, service impacts and costs of community waste events are reviewed on an annual basis and, as required, are re-evaluated to meet the needs of the Region. All requests for 2016 community events have been received from the local municipalities, permitting Regional staff to properly review, analyze, and plan the event strategy for the following calendar year.
- 9.37 In 2016, Durham Region will host, in partnership with each local municipality, eight spring Compost Give Away events, eight WEEE collection events and four MHSW collection events. A summary of the proposed 2016 Community Events is provided in Appendix #2. Details have been shared with local area municipalities and will be posted on the Region's website and the electronic Durham Region waste application.

By-Law Enforcement Update

- 9.38 Durham Region's two Waste Management By-law Compliance Officers work with the Waste Management Call Centre, the Waste Management contract administrators, and the Region's solid waste collection contractors to ensure compliance with waste management and diversion programs and to ensure the collection contractors provide the quality service that Durham residents expect.
- 9.39 By-law Compliance Officers also support resident outreach initiatives and enforce the Region's waste management By-law #46-2011. The majority of their work derives from service calls received by the Waste Management Call Centre. Together, the Compliance Officers service the Region's 225,000 households by splitting the Region's over 2,500 square kilometers area into two patrol areas.
- 9.40 In 2015, the Waste Management Call Centre handled 89,500 service calls. Many service calls are minor; however, some require detailed investigation that may result in the issuance of a Notice and further enforcement action. Of the approximately 89,500 service calls handled by the Region's Call Centre, 873 required escalation to official By-law cases.
- 9.41 Of the 873 cases, 592 involved the issuance of Notices, including 'Friendly Reminder' door hangers outlining by-law infractions and in-person meetings with residents to inform residents how to come into compliance. In some cases, officers issued repeat notices to specific addresses to achieve voluntary program compliance. An estimated additional 25 per cent of the 474 by-law related cases required repeat notices to achieve program compliance.
- 9.42 Successful case resolutions resulted in no tickets being issued for waste infractions in 2015. However, two previously-issued tickets for waste scavenging were processed in 2015: one going to trial and the other being settled out of court. Both cases resulted in a conviction registered on the record. Two Work Orders were issued for waste violations. Work Orders are legal documents requiring a property owner to take specific action, such as cleaning up a property to achieve compliance. Work Orders are an escalation to Notices and are issued when voluntary compliance is not achieved through the issuance Notices.
- 9.43 In addition to By-law compliance and enforcement, Compliance Officers work closely with the Region's solid waste collection contractors to ensure prompt service and collection compliance as required by the Region's collection contracts. Compliance often involves investigating cases with residents and contractors to resolve disputes and service related issues. Officers monitor contractor performance to ensure contract requirements and levels of service are being met. In 2015, officers resolved 399 service related cases addressing waste collection complaints and contractor performance related issues.

- 9.44 Since 2011, By-law Officers have acted on over 164 instances of suspected scavenging. Scavenging is the unauthorized removal of waste set out for municipal collection. Typically, scavengers remove electronics, scrap metal and LCBO containers from curbside set outs. In 2015, Officers addressed 25 cases of confirmed scavenging and identified five repeat offenders. Officers use discretion in considering various relevant factors when issuing tickets. In most cases, warnings are issued and kept on file for future enforcement. Generally, three warnings result in the issuance of a ticket for scavenging.
- 9.45 Compliance Officers work with the Region's curbside waste collection contractor to address specific areas with Green Bin organics contamination. Contamination generally consists of non-compostable materials and the use of plastic bags. In a specific case, 46, of 300 homes (or 15 per cent) in a neighbourhood were confirmed to have 20 percent or more material contamination. Officers conducted an education campaign visiting each non-complying home and providing education and samples of the proper certified compostable liner bags to use in the Green Bin. Further monitoring of curbside waste set outs confirmed that the targeted education campaign resulted in an overall reduction in SSO contamination to below five percent and a transition of about 70 percent of previously non-complying residents into successful program participation. This strategic outreach to improve Green Bin participation and reduce contamination is ongoing.
- 9.46 In 2015, the two Compliance Officers conducted 23 neighbourhood educational blitzes to achieve compliance for overall recycling, garbage, green bin, and leaf & yard waste related issues. The educational blitzes resulted in the delivery of 1,400 notices about how to set out blue boxes on windy days and an additional 940 notices identifying common infractions in specific neighbourhoods.
- 9.47 Specific ongoing program participation or material contamination issues are often addressed by various general promotion and education media. By-law Compliance Officers participate by conducting more targeted education blitzes where the Friendly Reminder door hangers with specific messaging are used to reach out to affected residents. Examples of issues dealt with in 2015 include:
- Proper waste set out/placement of garbage, green bins, blue boxes, porcelain bathroom fixtures, and leaf and yardwaste;
 - Contamination of recycling and green bin materials;
 - Stacking blue bins and setting out the morning of collection as opposed to the night before to prevent blowing litter; and
 - Severe weather –special clean up service offered/instructions for set out
- 9.48 Durham Region introduces municipal waste collection services to new residential developments as soon as it is safe for collection vehicles to travel through developments that are most often still under construction. By-law Compliance Officers are the Region's first contact for coordinating municipal solid waste collection services to these new residential developments. Officers coordinate with Regional staff to locate and monitor new developments throughout the

Region and liaise with developer and builder staff to monitor the construction stages of new developments to determine when the Region may initiate solid waste collection services. In 2015, By-Law Compliance Officers coordinated these services for about 6,550 new homes.

10. Conclusion

- 10.1 Durham Region operates its waste management program as a fully integrated system. Integrated Waste Management Systems combine waste prevention, recycling, composting and disposal programs intricately to minimize waste and utilize resources efficiently. Durham Region has many of the key elements of an integrated system and continued success depends on maintaining a consistent service delivery across all eight local municipalities.
- 10.2 Waste management systems are complex and influenced by various external factors. Never static, waste management best practices continually evolve to address changing demands and opportunities, including: population growth; commodities market fluctuations; demographic changes; policy, regulation and funding changes; evolving products and packaging; market directions; technological advancements and, more recently, climate change impacts. It is imperative that the waste management system continue to adapt to meet future waste management needs effectively and efficiently.
- 10.3 There remains uncertainty with respect to the proposed Bill 151 and the future responsibility of blue box material and other diversion goods like tires and electronics. Staff will continue to comment and update Regional Council on the potential impacts of Bill 151 and move forward with initiatives that increase diversion rates (e.g. the pilot project for C&D materials and the investigation of AD technology to remove organics from the garbage stream).
- 10.4 Final recommendations for the detailed Solid Waste Management Business Plan and Budget will be presented to Works Committee and Regional Council in early February 2016.

APPENDIX 1: Community Events**COMPOST GIVE-AWAYS (2016)**

<i>Town of Ajax*</i>	<i>Municipality of Clarington</i>
Saturday, April 16	Saturday, April 23
8 a.m. to noon	8 a.m. to noon
Ajax Operations Centre	Clarington Operations Depot
800 Salem Road North, Ajax	178 Darlington-Clarke Townline Road, Bowmanville

<i>Township of Brock</i>	<i>City of Oshawa</i>
Saturday, April 23	Saturday, April 30
8 a.m. to noon	8 a.m. to noon
Beaverton Community Centre	Lakeview Park (Parking Lot)
176 Main Street West, Beaverton	Kluane Avenue, Oshawa

<i>Town of Whitby</i>	<i>City of Pickering</i>
Saturday, May 7	Saturday, May 7
8 a.m. to noon	8 a.m. to noon
Whitby Operations Centre	Pickering Recreation Complex
333 McKinney Drive, Whitby	1867 Valley Farm Road, Pickering

<i>Township of Scugog</i>	<i>Township of Uxbridge</i>
Saturday, May 14	Saturday, May 28
8 a.m. to noon	8 a.m. to noon
Scugog Community Centre	Uxbridge Arena & Recreation Centre
1655 Reach Street, Port Perry	291 Brock Street West, Uxbridge

WASTE ELECTRICAL AND ELECTRONIC EQUIPMENT (WEEE) COLLECTION EVENTS

<i>Town of Ajax**</i>	<i>Township of Uxbridge**</i>
Saturday, April 16	Saturday, June 18
8 a.m. to noon	8 a.m. to noon
Ajax Operations Centre	Uxbridge Seniors Centre
800 Salem Road North, Ajax	75 Marietta Street, Uxbridge

<i>Township of Brock</i>	<i>Town of Whitby**</i>
Saturday, June 25	Saturday, September 17
8 a.m. to noon	8 a.m. to noon
Beaverton Community Centre	Whitby Operations Centre
176 Main Street West, Beaverton	333 McKinney Drive, Whitby

WASTE ELECTRICAL AND ELECTRONIC EQUIPMENT (WEEE) COLLECTION EVENTS CONT'D

<i>Municipality of Clarington**</i>	<i>City of Oshawa</i>
Saturday, September 24	Saturday, September 24
8 a.m. to noon	8 a.m. to noon
Clarington Operations Depot	Lakeview Park (Parking Lot)
178 Darlington-Clarke Townline Road, Bowmanville	Kluane Avenue, Oshawa

<i>Township of Scugog</i>	<i>City of Pickering</i>
Saturday, October 22	Saturday, October 22
8 a.m. to noon	8 a.m. to noon
Municipal Boat Launch	Pickering Recreation Complex
2 Old Rail Lane, Port Perry	1867 Valley Farm Road, Pickering

MUNICIPAL HAZARDOUS OR SPECIAL WASTE (MHSW) COLLECTION EVENTS

<i>Town of Ajax**</i>	<i>Township of Uxbridge**</i>
Saturday, April 16	Saturday, June 18
8 a.m. to noon	8 a.m. to noon
Ajax Operations Centre	Uxbridge Seniors Centre
800 Salem Road North, Ajax	75 Marietta Street, Uxbridge

<i>Town of Whitby**</i>	<i>Municipality of Clarington**</i>
Saturday, September 17	Saturday, September 24
8 a.m. to noon	8 a.m. to noon
Whitby Operations Centre	Clarington Operations Depot
333 McKinney Drive, Whitby	178 Darlington-Clarke Townline Road, Bowmanville

***Denotes Compost Give Away plus collection event(s)**

****Denotes co-collection event – WEEE & MHSW**

Dates and locations are subject to change with notice.

Appendix 2: Waste Collections Schedule (December 2015 to November 2016)

TOWN OF AJAX

- Green Bin and Blue Box scheduled for Friday, December 25, 2015 will be moved to the next day Saturday, December 26, 2015.
- Garbage, Green Bin and Blue Box scheduled for Friday, January 1, 2016 will be moved to the next day Saturday, January 2, 2016.
- Garbage, Green Bin and Blue Box scheduled for Friday, March 25, 2016 will be moved to the next day Saturday, March 26, 2016.
- Garbage, Green Bin, Blue Box and Yard Waste scheduled for Friday, July 1, 2016 will be moved to the next day Saturday, July 2, 2016.

CITY OF PICKERING

- Garbage, Green Bin and Blue Box scheduled for Friday, December 25, 2015 will be moved to the next day Saturday, December 26, 2015.
- Green Bin and Blue Box scheduled for Friday, January 1, 2016 will be moved to the next day Saturday, January 2, 2016.
- Garbage, Green Bin, Blue Box and Yard Waste scheduled for Friday, March 25, 2016 will be moved to the next day Saturday, March 26, 2016.
- Green Bin and Blue Box scheduled for Friday, July 1, 2016 will be moved to the next day Saturday, July 2, 2016.

TOWNSHIPS OF BROCK, SCUGOG, and UXBRIDGE

- Garbage, Green Bin and Blue Box scheduled for Friday, December 25, 2015 will be moved to the next day Saturday, December 26, 2015.
- Green Bin and Blue Box scheduled for Friday, January 1, 2016 will be moved to the next day Saturday, January 2, 2016.
- Garbage, Green Bin, Blue Box and Yard Waste scheduled for Friday, March 25, 2016 will be moved to the next day Saturday, March 26, 2016.
- Green Bin and Blue Box scheduled for Friday, July 1, 2016 will be moved to the next day Saturday, July 2, 2016.

MUNICIPALITY OF CLARINGTON

- Green Bin and Blue Box scheduled for Friday, December 25, 2015 will be moved to the next day Saturday, December 26, 2015.
- Garbage, Green Bin and Blue Box scheduled for Friday, January 1, 2016 will be moved to the next day Saturday, January 2, 2016.
- Garbage, Green Bin and Blue Box scheduled for Friday, March 25, 2016 will be moved to the next day Saturday, March 26, 2016.
- Garbage, Green Bin, Blue Box and Yard Waste scheduled for Friday, July 1, 2016 will be moved to the next day Saturday, July 2, 2016.

TOWN OF WHITBY and CITY OF OSHAWA

The City of Oshawa and Town of Whitby produce their own calendars. They run from July to June annually. In the event of a statutory Holiday, a “day” shift scheduled will be enacted as follows (*some dates may be tentative, pending confirmation from local municipality):

- Friday, December 25, 2015 (Christmas Day) all waste collection will shift one day forward (i.e. Monday to Tuesday, Tuesday to Wednesday and so on...)
- Friday, January 1, 2016 (New Year's Day) all waste collection will shift one day forward (i.e. Monday to Tuesday, Tuesday to Wednesday and so on...)
- Monday, February 15, 2016 (Family Day) – all waste collection will shift one day forward (i.e. Monday to Tuesday, Tuesday to Wednesday and so on...)
- Friday, March 25, 2016 (Good Friday) – all waste collection will shift one day forward (i.e. Monday to Tuesday, Tuesday to Wednesday and so on...)
- Monday, March 28, 2016 (Easter Monday) – all waste collection will shift one day forward (i.e. Monday to Tuesday, Tuesday to Wednesday and so on...)
- Monday, May 23, 2016 (Victoria Day) – all waste collection will shift one day forward (i.e. Monday to Tuesday, Tuesday to Wednesday and so on...)
- Friday, July 1, 2016 (Canada Day) – all waste collection will shift one day forward (i.e. Monday to Tuesday, Tuesday to Wednesday and so on...)
- Monday, August 1, 2016 (Civic Holiday) – all waste collection will shift one day forward (i.e. Monday to Tuesday, Tuesday to Wednesday and so on...)
- Monday, September 5, 2016 (Labour Day) – all waste collection will shift one day forward (i.e. Monday to Tuesday, Tuesday to Wednesday and so on...)
- Monday, October 10, 2016 (Thanksgiving) – all waste collection will shift one day forward (i.e. Monday to Tuesday, Tuesday to Wednesday and so on...)

Appendix 3 Solid Waste Management Performance Measurement Results

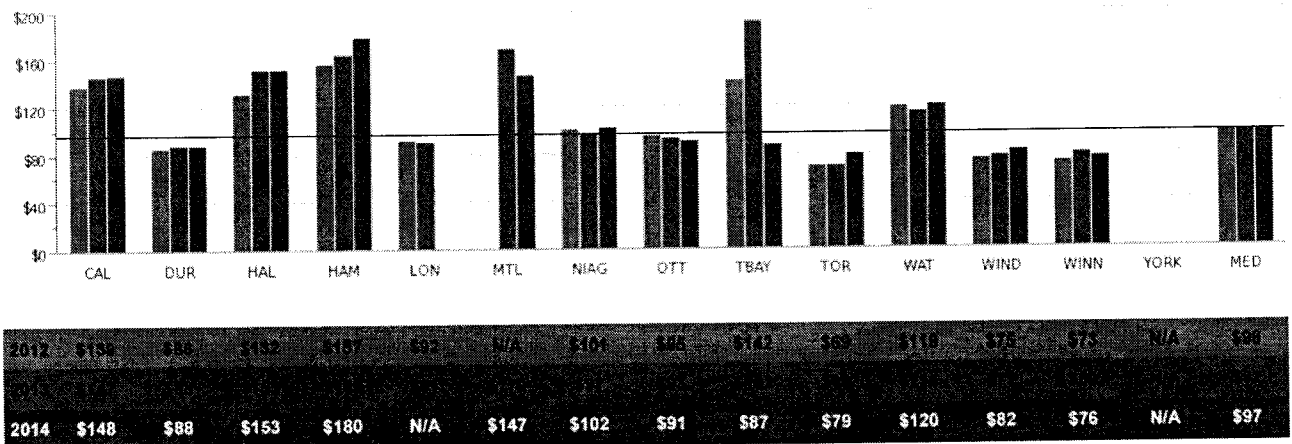
Once programs are implemented, performance is monitored, measured and evaluated. Performance measurement processes at Durham Region include:

- Measures incorporated into the detailed business plan and budget deliberation;
- Measures reported to provincial authorities as part of the Municipal Performance Measurement Program; and
- Measures developed and reported through collaborative initiatives with other municipalities, including the Ontario Municipal Benchmarking Initiative (OMBI).

The Ontario Benchmarking Initiative (OMBI) 2014 Performance Measurement Report was released in November 2, 2015. Results are available for 25 Durham Region service areas, including Solid Waste Management. Compared to OMBI peers, Durham Region's 2014 waste collection costs are low, totaling \$88 per tonne collected, compared to the median cost of \$97 per tonne for the peer group overall.

What is the total cost to collect a tonne of waste?

Fig 34.2 Total Cost for Garbage Collection per Tonne - All Property Classes (includes amortization)



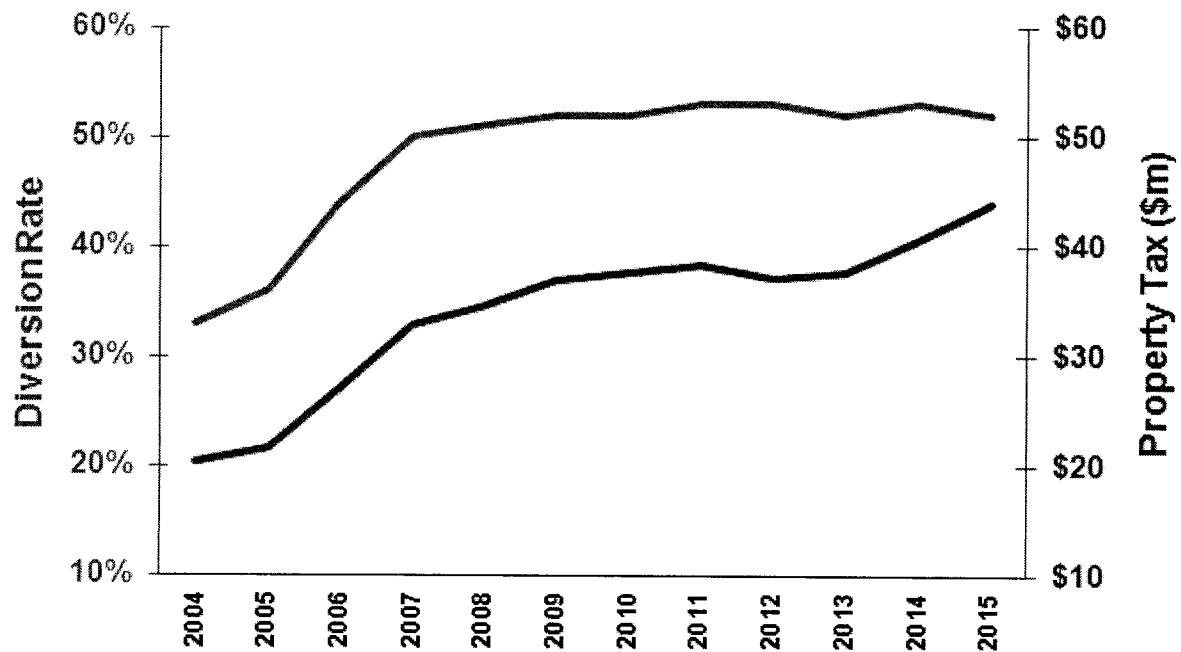
Source: SWST311T (Efficiency)

Durham Region is responsible for the curbside collection of all municipal solid waste within six of Durham's local area municipalities and collects Blue Box waste materials within the City of Oshawa and the Town of Whitby who maintain responsibility for collection of garbage, Green Bin kitchen waste, yard waste, bulk goods and white goods materials within their jurisdiction. The Region receives all waste from each of the eight local area municipalities and is responsible for its processing, haulage, recyclables

marketing and disposal.

The following chart demonstrates the correlation between net property tax expenditures for solid waste management and diversion. The most significant program cost increases occurred with the largest increase in diversion, once collection responsibilities had been uploaded from six of the eight local area municipalities (by 2004) and curbside diversion collection programs were introduced (Green Bin) or expanded (Blue Box plastics).

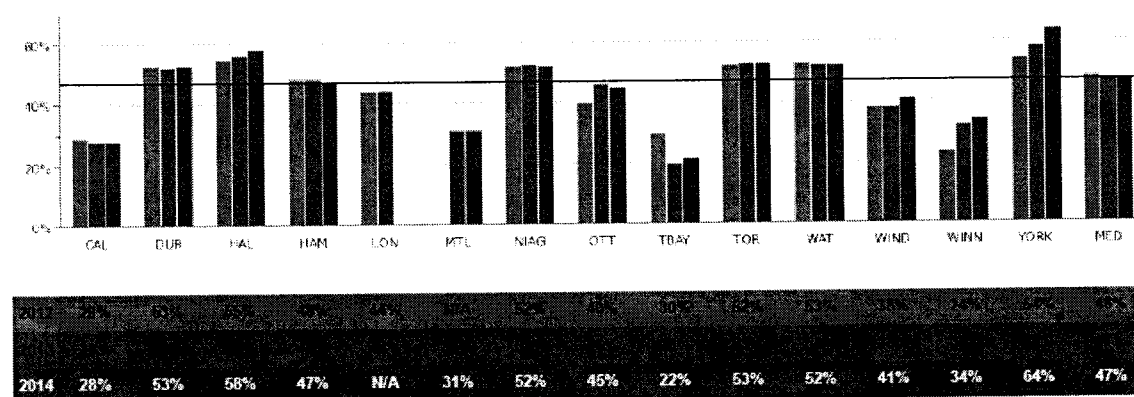
Graph 1
Solid Waste Diversion and Regional Net Solid Waste Expenditures
(2004 to 2015)



Durham Region remains above the median diversion rate of its OMBI peers (a median of 47 per cent diversion compared to Durham Region's 53 per cent diversion rate for 2014).

What percent of residential waste is diverted away from landfills?

Fig 34.7 Percent of Residential Solid Waste Diverted –Single and Multi- Residential



Source: SWST105M (Community Impact)

Note: The measure demonstrates the percent of residential waste diverted away from landfills and incineration through programs such as organics, blue box, leaf and yard, municipal hazardous or special waste and other recyclable materials, e.g. wood, metal, tires.

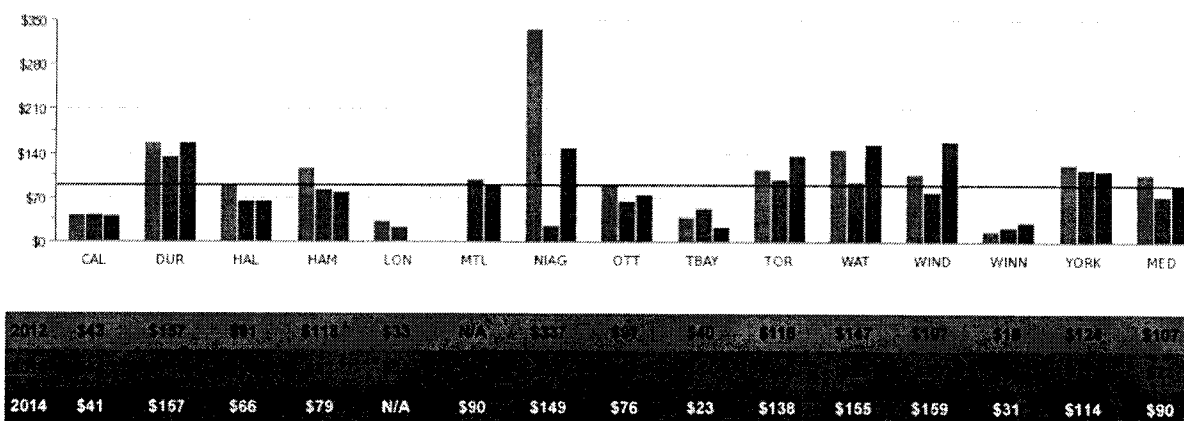
Durham Region's 2014 costs for waste diversion and garbage disposal were above its peers at approximately \$157 per tonne for residual garbage disposal costs and approximately \$199 per tonne for diversion costs. Disposal costs are influenced by many factors including availability and distance to disposal sites, fuel costs and landfill site requirements. Declining active landfill capacities in Ontario typically result in increased landfill rates, increased transportation costs and diminishing Ontario landfill options. These risks will be reduced with the implementation of DYEC commercial operations in 2016.

Also influencing disposal costs tracked through OMBI, the Region must monitor and provide perpetual care to existing landfill sites, which for Durham includes seven inactive landfill sites (Brock Township landfill stopped receiving new waste in 2014).

Landfill sites represent long-term liabilities and continued environmental protection and periodic remediation, including surface and groundwater protection measures, are required periodically over the long-term. Future remediation of Durham's existing sites is part of the capital forecast, with an additional \$66.6 million estimated to be required between 2016 and 2025.

What is the total cost to dispose of a tonne of garbage?

Fig 34.4 Total Cost for Solid Waste Disposal per Tonne - All Property Classes (includes amortization)



Source: SWST325T (Efficiency)

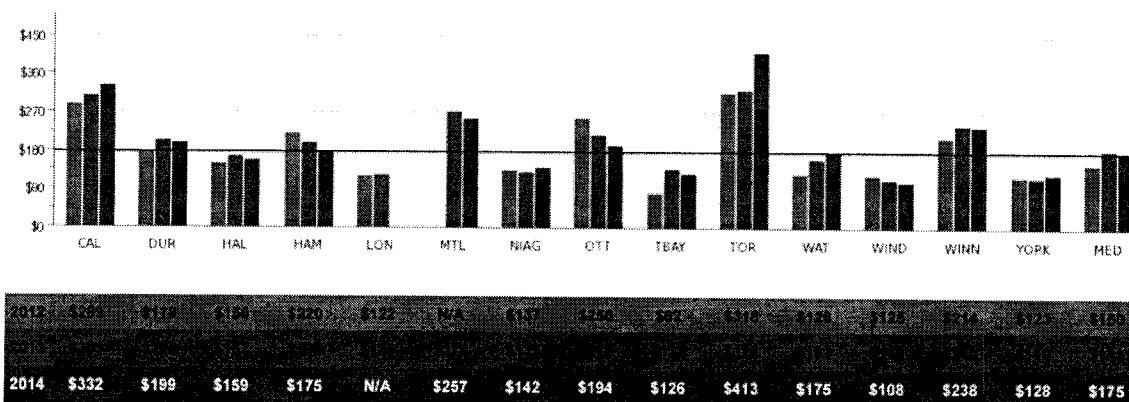
Note: All Property Classes includes residential and ICI (Industrial, Commercial and Institutional) locations. In addition, declining landfill capacities typically result in increased landfill rates. Other impacts such as additional costs of transporting waste outside a community, aging infrastructure, capital costs, the cost associated with the incineration of garbage, service agreements, increase in leachate treatment and fluctuating fuel costs also impact the results.

These results can be impacted significantly due to the recording of post-closure landfill liability costs.

Durham's cost to divert a tonne of garbage was \$199 per tonne in 2014, or 13.7 per cent above the median amount of \$175 per tonne. Cost differences reflect diverse service levels and differing circumstances across municipalities, including the types and amounts of diversion materials collected, the level of promotion and education expenditures, the magnitude, age and condition of recycling infrastructure, private versus public service providers and other factors (e.g. distance to market and material revenues and composition).

What is the total cost to divert a tonne of garbage?

Fig 34.6 Total Cost for Solid Waste Diversion per Tonne - All Property Classes (includes amortization)



Source: SWST330T (Efficiency)

Note: "All Property Classes" includes residential and ICI (Industrial, Commercial and Institutional) locations.