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The Regional Municipality of Durham
Report

To:	The Committee of the Whole
From:	Commissioner of Finance and Commissioner of Works
Report:	#2017-COW-16
Date:	January 11, 2017

Subject:

The 2017 Solid Waste Management Servicing and Financing Study

Recommendations:

The Committee of the Whole recommend to Regional Council that:

A) The 2017 annual Servicing and Financing Study be received in support of the detailed 2017 Business Planning and Budget deliberations.

B) The Province of Ontario be requested to extend the 45-day comment period to beyond January 30, 2017 for the "Proposed Strategy for a Waste-Free Ontario: Building the Circular Economy" (released December 16, 2016 under EBR Registry Number 012-9356), in order to allow sufficient time for Regional Council to review and provide feedback.

C) The Province of Ontario be requested to exempt the Durham York Energy Centre (DYEC) located in Durham Region from the cap and trade emission trading program in order to ensure the consistency and effectiveness of integrated waste management systems in achieving greenhouse gas reductions.

D) For 2017 Business Planning and Budget purposes:

   i) Capital improvements to enhance container line productivity at the Region's Material Recovery Facility (MRF), be included in the 2017 Business Plan, at an estimated cost of up to $2 million with partial financing from a grant totaling up to $872,627 from the new Resource Productivity and Recovery Authority (RPRA), with authorization given to the Commissioner of Finance to execute the funding agreement subject to 2017 capital budget approval for the MRF enhancements.

   ii) The Region's one-year Construction and Demolition (C&D) pilot program be discontinued due to difficult market conditions, material contamination issues, minimal diversion impacts and overall cost impacts due to the double handling of waste volumes prior to disposal.

iii) A study be undertaken at a cost not to exceed $60,000 to investigate potential for future uses of the Region's closed Oshawa landfill site once it is capped and rehabilitated.

E) The following DYEC requirements be referred to the 2017 Business Plan and Budget process for approval:

i) Additional operational costs totaling up to $120,000 to fund environmental monitoring around the site during 2017, including review and evaluation of ambient air data received to date ($50,000); continuation of fence line monitoring ($40,000); and to undertake a peer review of AMESA results ($30,000).

ii) Additional funding in the amount of $300,000 to complete Host Community Agreement (HCA) commitments related to the completion of Energy Drive in the Municipality of Clarington, with the proposed funding of Durham's share from the Solid Waste Management Reserve Fund.

Report:

1. Purpose

1.1 This report outlines Solid Waste Management programs and associated financing challenges for the 2017 to 2026 business planning period and sets the stage for review and approval of the detailed 2017 Solid Waste Management Business Plan and Budget. Ongoing risks and uncertainties, related to waste material composition, recyclables markets and tonnage and collection stop count (growth) impacts are continuously monitored.

1.2 The Region's integrated waste management system faces significant challenges and changes related to the ongoing provincial review of roles and responsibilities for diversion programs. Extended producer responsibility (EPR) policies, a proposed provincial organics strategy, climate change policy and initiatives and a new cap and trade emissions trading system combine with the pressures due to population growth and waste generation per household (single family and increasingly multi-family) to create considerable uncertainty over the current forecast period. This report presents both challenges and opportunities and highlights significant ongoing studies being undertaken to ensure the Region's solid waste management system remains efficient, successful and adaptable in the new environment in which it must operate.

2. Background

2.1 The current Regional solid waste management system is complex with costs driven primarily by the number and density of household waste collection stops; the distance to transfer, processing, final market/end-use or disposal destinations; subsidies and market prices for diversion materials; and, tonnage-based

contractual costs for waste transfer, inspection, haulage and disposal.

2.2 A detailed update on ongoing Regional programs, including re-use and special events, battery collection, multi-residential and single family collection programs, education, outreach and enforcement is provided in Attachment #1: Existing Solid Waste Management Program Updates. Attachment #2 provides the proposed Waste Collection Holiday Schedules for 2017.

2.3 Once solid waste management programs are implemented, performance is monitored, measured and evaluated. Some examples of performance measurement results for Durham Region Solid Waste Management are included within Attachment #3. Additional performance measures are provided within the annual business plan and budget.

2.4 Various initiatives will continue in 2017 based on prior approvals, including:

A) A study to investigate options for implementing a long-term organics management plan, including pre-sort at the point of waste transfer and anaerobic digestion (AD) processing to increase the extraction of organics from single family and multi-residential waste streams;
B) The first full year of DYEC Commercial Operations;
C) The Blackstock landfill site mining pilot; and,
D) The remediation and closure plan for the Oshawa landfill site.

3. Provincial Regulatory Change and Extended Producer Responsibility (EPR)

3.1 Despite significant efforts to increase tonnage-based diversion to achieve the Region's 70 per cent diversion goal, changes to industry products and packaging due to provincial policy and specifically extended producer responsibility (EPR), will continue to impact municipally-reported waste diversion rates, tonnages, programs and net costs.

3.2 Over the past decade, evolving competitive global markets and environmental pressures have driven producers to make recyclable products and packaging increasingly lighter. Lighter materials are more complex and voluminous for municipalities to handle and they also replace heavier materials which influence municipal diversion rates. Since diversion rates are weight based, both the Region's diversion rates and tonnages have remained relatively flat, especially over the last five years. That said, individual container volumes have increased. This volume increase of recyclables requires additional equipment and time to collect and process. This results in increased costs without a corresponding increase in the Region's diversion rate.

3.3 Further, although recognized as a societal benefit, provincial initiatives are shifting the responsibility for diversion materials from municipalities to producers and will continue with the November 30, 2016 proclamation of Bill 151, *The Waste-Free Ontario Act*. On December 16, 2016, the Province also released its final "Strategy for a Waste-Free Ontario: Building the Circular Economy" which includes four objectives and 15 actions to create a circular economy and minimize the use of

raw materials, while maximizing the useful life of resources.

3.4 Objectives within the Provincial Strategy include:

- Enhancing provincial direction and oversight;
- Creating conditions to support sustainable end-markets;
- Enabling efficient and effective recovery systems; and,
- Increasing waste reduction and resource productivity.

3.5 New regulations related to the *Waste Free Ontario Act* are anticipated in the next year or two. While municipalities will continue to have responsibility for the collection, processing and disposal of organics and residual garbage, the long-standing designated diversion programs, including Blue Box, Municipal Hazardous and Special Wastes (MHSW), Waste Electrical and Electronic Equipment (WEEE), and used tire programs may significantly change over the forecast period. One of the key objectives of the Strategy for a Waste Free Ontario is the "transition of existing waste diversion programs smoothly to new producer responsibility framework without disruption of services" (Strategy, page 11). At this time, and based on discussion with the Association of Municipalities of Ontario (AMO) staff, Durham staff do not anticipate any changes to the various EPR fee structures. Industry funding organizations will continue to fund program costs through the transition to the new producer responsibility framework. Producers of waste and packaging will be required to register with the new waste authority as well as negotiate new agreements with municipalities or other potential waste diversion program service providers.

3.6 Considerable uncertainty remains around the details and timing of the transition, new framework and funding regime until provincial regulations are made available. Regional Council made several recommendations to the Province related to the first release of the proposed *Waste Free Ontario Act* (Attachment #4 provides Report 2016-J-6's recommendations), including the position that the municipal role be fully funded with full and fair compensation for any municipal services or infrastructure.

3.7 With the proclamation of the *Waste Free Ontario Act* and its schedules: the *Resource Recovery and Circular Economy Act* and *Waste Diversion Transition Act* on November 30, 2016, the following are in effect:

i) *The Waste Diversion Act* (WDA) is repealed;

ii) The Regional Official Plan must remain consistent with resource recovery and waste reduction provincial policy statements;

iii) Current diversion regulations/funding programs under the previous WDA will (eventually) be replaced with new regulations administered by the new Resource Productivity and Recovery Authority (RPRA) responsible for ensuring implementation of EPR, including potential:

- Reduction or elimination of specific waste materials (i.e. disposal bans);

- Establishment of new material collection systems by producers;
- Producer requirements to increase re-useable/recyclable product end-markets; and,
- Forced promotional/education programs by material stewards and possibly others (e.g. municipalities);

iv) Municipal consultation is required for any program changes proposed by industry and the RPRA (the provincial timeline proposes 2017/18 consultations and a phased approach with significant programs commencing implementation by 2019);

v) Existing diversion programs administered by municipalities will continue as they are until new program plans are developed; and,

vi) Waste diversion programs under the new legislation must not promote the burning of waste, landfilling or the application of waste to land.

3.8 The Ministy of the Environment and Climate Change (MOECC) was also required to publish a Waste Free Ontario Strategy (Strategy) for consultation within 90 days, including an action plan to move Ontario to a circular economy (zero waste and zero GHG emissions). This Strategy was released on December 16, 2016 on the Environmental Registry (EBR Number 012-9356) as the "Strategy for a Waste-Free Ontario: Building the Circular Economy" with a 45 day comment period ending January 30, 2017. It is recommended that the province be requested to extend the comment period beyond January 30, 2017 to allow time for Regional Council review and feedback.

3.9 The transition to the new framework is anticipated to take between three and five years, with additional transition details anticipated in 2017.

3.10 The Region's longer-term plans for solid waste management to increase waste diversion, including ongoing capital planning studies and projected new facility requirements, need to be re-examined in light of new regulations which could significantly affect business cases, specifications and implementation plans and partnerships.

3.11 While municipalities are generally supportive of the legislation, there remain uncertainties related to the regulatory details still forthcoming, and potential impacts during transition and thereafter. Staff continue to work with the Provincial government and other stakeholders, including AMO and the Regional Public Works Commissioners of Ontario and will report back to Regional Council on the new regulatory and funding framework as it develops, including any implications for Regional waste programs and funding.

4. Solid Waste Diversion

4.1 Significant waste diversion programs and improvements to existing programs have been implemented by the Region to enhance diversion beyond 50 per cent (a 55 per cent diversion rate is projected for 2016 including diversion credits), including the introduction of the composting of source-separated organics (SSO), garbage

bag limits, and enhanced Blue Box recycling through expansion of accepted materials. New diversion collection programs have been implemented both at the curb and at the Region's Waste Management Facilities (WMFs), including new diversion programs for electronics, re-use items, porcelain and batteries.

4.2 The diversion rate is perceived to be flattening largely as a the result of tonnage losses within the Blue Box and other waste diversion streams related to provincial product stewardship programs, return to retail programs (such as the Liquor Control Board of Ontario (LCBO) 'Bag It Back' program for containers), product and packaging lightweighting, scavenging of high value materials from the curb, and slower economic growth.

4.3 Material processing and handling equipment must be capable of handling increasing volumes of lighter materials. New material processing and handling equipment is currently being considered for the Region's MRF to enhance container line productivity, given the significant increase in the volume of lighter weight materials.

4.4 The year 2017 marks the MRFs tenth anniversary. Material composition and volumes have changed over this time and in order for the MRF to continue to be effective and efficient at sorting this new and growing material mix, equipment upgrades to the facility are required.

4.5 Capital improvements to enhance container line productivity at the Region's MRF, at an estimated cost of up to $2 million, are recommended with partial financing from a grant totaling up to $872,627 from the new Resource Productivity and Recovery Authority (previously Waste Diversion Ontario) Continuous Improvement Fund (CIF), subject to 2017 capital budget approval for the MRF enhancements.

4.6 In addition, discussions will continue with the LCBO, the Beer Store and Miller Waste Systems, (the current MRF contractor), to explore opportunities for recovery and diversion of liquor and beer containers from the Blue Box stream at the Region's facility, to assist in lowering the net Regional costs associated with mixed broken glass.

4.7 In 2015/16, an attempt was made to further enhance diversion results and reduce solid waste to disposal through the implementation of a one-year construction and demolition (C&D) materials recycling pilot which commenced in October 2015 and ran through October 2016. C&D materials include small scale renovation, construction and demolition waste materials received at the Region's WMFs.

4.8 Unfortunately, the program was not deemed successful and is recommended to be discontinued due to undeveloped markets, material contamination issues, unacceptable disposal rates and resulting negative cost impacts due to the double handling of waste volumes prior to disposal. Regional staff will continue to review options and impacts related to pending Waste Free Ontario regulations.

4.9 The analysis of options for the development of Durham's integrated waste management system continues. This includes proposed facilities and equipment to support additional storage and inspection capability, waste transfer and pre-

sorting capabilities to extract organics and recyclable materials. In addition, the Region is moving forward with the review and business case analysis regarding potential for anaerobic digestion (AD) technology to process an expanded organics diversion stream, including organics such as pet waste and diapers.

5. Long-term Organics Management Planning

5.1 The Province proposes consultations during 2017 on development of a "Food and Organic Waste Action Plan." The provincial Organic Waste Action Plan (OWAP) will guide the implementation of initiatives related to the Region's current investigation of long-term organics management options and strategies and could also present opportunities.

5.2 The Province's timeline for transformation of the current waste management framework also includes 2018 consultations on potential disposal bans which could include food waste materials currently managed under existing waste diversion programs by 2022. Implementation of the OWAP is anticipated to commence in 2019 with the transition of existing waste programs (with the exception of Blue Box anticipated by 2020 and completed by 2022). Disposal bans are not anticipated to begin implementation until 2021.

5.3 In addition to provincial regulatory changes and the anticipated OWAP, the Region's waste composition studies have already demonstrated organics as a significant source for future diversion potential. The focus of municipal diversion initiatives on a go-forward basis is expected to be the organics waste stream, including enhanced capture of organics from both the single family and multi-residential waste streams. A significant portion of the residual garbage stream, destined for the Region's DYEC, is currently identified as organic.

5.4 With capacity limits currently being faced for both organics processing and disposal, Regional Council directed a study be launched to explore integrated waste management options which could address capacity issues and explore options for a long-term organics management plan and 70 per cent diversion. GHD Limited, with their partners Ernst & Young Orenda Corporate Finance Inc. and 2cg Waste Management Consulting Services, was retained through a competitive Request for Proposals to carry out a financial and technical consulting assignment and explore options for a long-term organics management plan (Report 2016-J-7). The study commenced in August 2016 and has three main components, with the third subject to Regional Council approval, based upon results and recommendations resulting from Parts 1 and 2 which includes business case and service delivery analyses, as described within Attachment #5.

5.5 With the study underway and anticipated to be completed in 2017, Regional staff have also applied to the Green Municipal Fund (GMF) administered by the Federation of Canadian Municipalities (FCM) to cover up to $175,000 of the total $355,000 cost of Parts 1 and 2 of the consulting assignment. FCM feedback regarding the GMF application process will not be known until early 2017.

5.6 The solid waste management capital forecast includes an updated estimated cost and timing for the implementation of mixed waste pre-sort capabilities as well as

development of an AD facility. The initial estimates of costs to construct an AD facility could range from $30 million to $60 million based on required right sizing and economies of scale analysis (currently underway). In addition, pre-sort and transfer capability at an estimated cost of $28 million would also be required to accommodate AD at the point of transfer.

5.7 AD processing, subject to required approvals, could process mixed multi-residential and single family waste to enhance and expand the capture of organics and recyclables from the residual waste stream, while providing the potential for energy generation and associated cost savings and/or revenues. The cost and estimated timing for both pre-sort and AD will be refined as GHD completes its technical and financial work and a report is brought forward to Regional Council following completion of the study in 2017.

6. Blackstock Landfill Mining Pilot Project

6.1 Financing for the Blackstock Landfill Mining Pilot project was approved in 2015. The pilot is being undertaken rather than typical landfill remediation through the acquisition of buffer land which allows for natural attenuation of the landfill site.

6.2 Landfill mining is typically undertaken to increase capacity for disposal, however, the proposed mining project at Blackstock is a restorative project with the objective of returning the land to public use or green space. This involves the removal of waste from the site for processing at the DYEC and removal of recyclables for diversion. 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.

6.3 If successful, the pilot will inform capital costing for remediation/reclamation of the Region’s other smaller landfills (e.g. the Scott and Scugog landfills are identified for approximately $2.8 million in reclamation/remediation projects through to 2018).

6.4 A Request for Pre-Qualification was issued in June 2016 to ensure that only general contractors with landfill mining experience or similar remediation work would be pre-qualified to bid on the construction tender. Eight submissions were received and three general contractors were pre-qualified. The current work plan is to award the tender by January 2017. Golder Associated was retained in early 2016 to provide construction oversight. Approval for the project was issued by the MOECC on July 4, 2016 through an amendment to the site’s Environmental Compliance Approval. Waste excavation is to commence in the first quarter of 2017. Monitoring reports will be provided as required to the MOECC on June 30th of each year.

7. Oshawa Landfill

7.1 In December 2013, CH2M-Hill completed a Post Closure Care Plan for the Oshawa Landfill that includes updated monitoring and maintenance programs. This plan recommended an evolutionary approach to site maintenance activities that starts with low cost bio-remediation options before moving onto more expensive engineering solutions as necessary. Site issues include slope stability along the Oshawa Creek, buffer land acquisition requirements, maintenance of the land-fill cover and adding more groundwater monitoring stations.

7.2 A remediation project to address the slope stability issue and iron staining was completed in 2015. This project involved re-grading, creating a filter bed for the groundwater, stream diversion and installation of a compost system to stabilize the slope and provide a vegetative medium. To date, results have been positive. In 2016, Palmer Environmental was retained to conduct a geomorphology study of the surrounding Oshawa Creek and its tributaries. This study will identify and prioritize the seep and erosion areas for 2017/18 remediation.

7.3 Regional staff have also been in discussions with both the City of Oshawa and Scouts Canada to investigate potential land acquisitions along the northern boundary of the site (Camp Samac), subject to Regional Council approval.

7.4 In 2016, elevated levels of volatile organic compounds were found in one of the monitors along the west side of the landfill. Six monitoring wells were installed in 2016 to investigate the source of the issue, with wells sampled over the summer months. A report including recommended actions will be forthcoming.

7.5 In addition to ongoing monitoring of landfill gas, groundwater and surface water in 2016, Regional staff met with Gerdau Ameristeel as they proposed providing soil at no cost to the Region for cover maintenance requirements to fill in low lying areas. A protocol for sampling was developed with locations that require cover and material amounts were determined. Overall 64,000 cubic metres (m^3) of all material is estimated to be required in two phases over 2017 and 2018. Gerdau provides the soil sampling results and will haul the material to the site at no cost to the Region. The Region will provide truck access and grade the material to achieve required slopes. The soil is native material that has a high clay/silt content which is required for landfill final cover.

7.6 Finally, based on a previous study that determined it was no longer effective, decommissioning of the active gas collection system (installed in 1980) commenced and should be completed by 2017.

7.7 Prior approvals were obtained for a capital budget of $1.5 million for the implementation of activities related to the issues identified above.

7.8 Following the landfill capping, staff recommend a study for the rehabilitation of the landfill for potential future use not to exceed $60,000, as part of 2017 Budget deliberations.

8. Waste Data Trends

8.1 The Region utilizes stop count growth (i.e. number of households), as determined by Municipal Property Assessment Corporation (MPAC) data, as the costing element for collection contracts and stop count adjustments within collection contracts. Table 1 provides contractual stop count actuals from 2011 to 2015, as well as 2016 (estimated) and 2017 Budget stops. Collection service stop count growth in 2017 is projected at 1.5 per cent.

Table 1: Collection Stops
(2011 to 2015 Actuals, 2016 Estimated and 2017 Budget)

	2011	2012	2013	2014	2015	2016 Estimated	2017 Budget
Ajax	32,308	33,021	33,640	34,229	34,774	35,240	36,230
Brock	4,712	4,702	4,710	4,722	4,739	4,767	4,770
Clarington	28,467	29,106	29,678	30,218	30,751	31,348	32,190
Oshawa	45,823	46,188	46,645	47,230	47,878	48,548	49,010
Pickering	25,550	25,969	26,194	26,406	26,885	27,191	27,480
Scugog	8,101	8,187	8,194	8,206	8,245	8,304	8,320
Uxbridge	7,039	7,085	7,095	7,125	7,221	7,342	7,400
Whitby	36,933	37,647	37,987	38,262	38,455	38,958	39,390
Total	**188,933**	**191,905**	**194,143**	**196,398**	**198,948**	**201,698**	**204,790**

8.2 Over the previous five years, overall tonnage growth has averaged approximately 0.4 per cent growth, compared to approximately two per cent tonnage growth per year over previous decades. However this does not imply less waste is being managed in terms of volumes.

Table 2:
Regional Solid Waste Tonnages
(2011 to 2015 Actuals, 2016 Estimated and 2017 Budget)

	2011	2012	2013	2014	2015	Estimated 2016	Budget 2017
Blue Box	53,158	51,688	50,466	49,531	48,268	48,311	48,700
Food Waste	26,865	26,898	27,487	27,007	26,796	27,005	27,550
Yard Waste [(1)]	23,744	25,469	25,268	32,123	27,554	25,891	26,572
Reuse programs	7,214	6,724	6,364	6,284	7,152	10,551	8,996
Garbage	107,670	107,722	109,641	110,417	110,498	107,561	110,500
TOTAL	**218,651**	**218,501**	**219,226**	**225,362**	**220,268**	**219,319**	**222,318**

Notes:

1 The increased yard waste tonnages in 2014 were due to the 2013 ice storm clean-up. Yard waste includes Christmas tree collections.

2 Although included in the diversion rate calculation, the table above excludes backyard composting and grass cycling credits (representing an estimated 11,927 tonnes for 2016).

3 Figures may not add due to rounding.

8.3 In addition to cost impacts from tonnage increases and growth, the Region's solid waste processing, inspection, transfer, haulage and disposal contracts increase annually based on contractual escalation benchmarks (primarily based upon the Consumer Price Index and diesel benchmark adjustment for haulage contracts).

8.4 A more detailed analysis of solid waste management data, including tonnage and collection stop trends and revenues received for recyclable materials is provided in Attachment #6.

9. 2017 Financial Outlook

9.1 Waste management costs are driven by a number of factors, including but not limited to: tonnages, waste volumes, growth, inflationary increases, changing regulations and market forces.

9.2 Net proposed 2017 Solid Waste Management Budget impacts include the following:

- Net tonnage and stop count changes;
- Contractual escalation (including fuel surcharge adjustments) for collection, transfer, inspection, haulage and disposal contracts;
- Facility maintenance, repairs and replacements per the Region's asset management program; and,
- Implementation of approved capital projects.

9.3 The first full year of DYEC Commercial Operations will occur in 2017. The DYEC started Commercial Operations on January 29, 2016 and the final Acceptance Certificate was issued on November 23, 2016. Attachment #7 provides a detailed DYEC Construction Update.

9.4 The Regions of Durham and York have paid Covanta Durham York Renewable Energy Ltd. all contractually defined construction milestone payments for completion of the DYEC Design Build Work ($252.99 million with Durham's share at $191.47 million). A construction guarantee is now in place through a letter of credit in the amount of approximately $12.0 million.

9.5 The following requirements which remain outstanding related to monitoring and the Host Community Agreement (HCA) with the Municipality of Clarington are recommended to be referred to the 2017 Business Plan and Budget process for approval:

- Additional operational costs totaling up to $120,000 to fund environmental monitoring around the site during 2017, including review and evaluation of ambient air data received to date ($50,000); continuation of fence line monitoring ($40,000); and peer review AMESA results ($30,000); and
- Additional construction funding in the amount of $300,000 to complete the HCA

commitments related to the completion of Energy Drive, with proposed funding of Durham's share from the Solid Waste Management Reserve Fund.

9.6 As the first full year of Commercial Operations commences in 2017, there are various potential go-forward risks as outlined below which are being addressed by Regional staff:

- Project Agreement disposal obligations associated with 2016 Bypass Waste during the period of the Boiler shutdown (i.e. waste "received" but not combusted);
- Final tender results for the required tunnel beneath the Canadian National Railway Company line (an amount of $1.1 million has been included in projected HCA and Site Servicing costs);
- Uncertainty related to York Region's 50/50 capital cost share commitments;
- The new cap and trade emissions trading framework in Ontario, including risk that the free carbon emission allowances granted to the DYEC during the first compliance period may not be extended beyond 2020;
- The additional cost exposure resulting from the cap and trade regulation of upstream natural gas and fuel distributors;
- Actual operating fee adjustments and impacts over the term of the 20-year Project Agreement with a projection of operational cost from 2017 to 2021 as detailed in Attachment #7; and
- The operating fee adjustments of the Project Agreement represent embedded financial derivatives given that the operating fees are pegged to variable indices and represent a transfer of financial risk between the parties over the 20 year term. The impact of the financial risks will be monitored and disclosed over the course of the contract.

10. The Preliminary 10-year Solid Waste Management Capital Program

10.1 The preliminary 10-year capital program is shown in Table 3 below and remains subject to ongoing study and business case results and Regional Council approvals.

Table 3
Preliminary Solid Waste Management Major Capital Forecast ($ Millions)[1]

	Proposed 2017	2018	2019	2020	2021	2022-2026	Total 2017-2026
Capital Expenditures							
Landfill Remediation Reclamation		3.2		0.8	0.8	2.0	6.8
Waste Transfer Facility		7.0					7.0
Mixed Waste Pre-sort		28.0					28.0
Organics Processing / AD	0.8	44.0					44.8
Enhancement of Optical Sorting Equipment at MRF	2.0						2.0
Seaton Waste Management Facility				8.5			8.5
Total Capital	**$2.8**	**$82.2**	**$0**	**$9.3**	**$0.8**	**$2.0**	**$97.1**

	Proposed 2017	2018	2019	2020	2021	2022-2026	Total 2017-2026
Financing							
Property Taxes	0.4	3.2		0.8	0.8	2.0	7.2
Solid Waste Reserve	1.5	7.0		3.5			12.0
Grant Funding	0.9						0.9
Other [2]				5.0			5.0
Debentures [3]		72.0					72.0
Total Financial	**$2.8**	**$82.2**	**$0**	**$9.3**	**$0.8**	**$2.0**	**$97.1**

Notes:
(1) Depending upon the new provincial regulatory and funding framework for existing and potential new diversion programs and potential opportunities available to the Region as service provider under the shift to extended producer responsibility, an additional $9 million could be added to the capital forecast, subject to business case, for the implementation of eco-stations or related reuse program modifications to existing WMFs.
(2) Other financing includes funding to be received as part of the Seaton Front-Ending Agreement.
(3) If the AD and pre-sort capital projects are subsequently approved, it will be recommended that the annual debt servicing costs, estimated at $9.3 million per year over ten years, be financed from the Federal Gas Tax.

10.2 Net 2018 to 2026 capital expenditure and financing pressures in solid waste management include the following:

- Development of a comprehensive long-term organics diversion plan potentially including mixed waste pre-sort, transfer and AD facilities, based on the ongoing evaluation of viable options;

- New and upgraded sorting equipment at the Region's MRF (approximately $2 million) to enable more efficient processing of increasingly light-weighted

materials collected through the Blue Box program, possibly offset by the receipt of funding from CIF to a maximum grant contribution of $0.9 million as recommended;

- Landfill (seven closed landfills) perpetual monitoring, risk management and remediation and potential for additional landfill mining based on the Blackstock landfill pilot (ongoing to June 2017 with post project monitoring and potential application to other Regional landfills); and,

- Ongoing capital maintenance, repairs, replacements per the Region's Corporate Asset Management Program.

10.3 Should ongoing feasibility, options and business case analyses support the proposed capital plan to 2026, the solid waste management staffing complement is also expected to increase. Other operational costs could increase due to new facilities' construction or expansion. Reports and recommendations will be presented as required and refined based upon ongoing analysis and individual project advancements, subject to business case analyses and ongoing approvals.

10.4 The solid waste management capital forecast includes an updated estimated cost and timing for pre-sort technology, transfer and an AD facility which is now anticipated, if approved, to incur a one-year design and permit phase followed by a one-year construction phase commencing in 2018 with operations starting in 2020. The $45 million included in the waste capital forecast is based on currently anticipated costs for a new AD facility which could range from $30 million to $60 million based on required right sizing and economies of scale analysis (analysis currently underway).

10.5 The Region would also require pre-sort and transfer equipment capability to support an AD facility (estimated cost of an additional $28 million), including mixed wastes from multi-residential units and enhanced capture of additional recyclable materials currently identified within the residual waste stream.

10.6 At its meeting of November 28, 2013, the Joint Finance & Administration Committee considered options to demolish the existing facility at 4600 Garrard Road, Town of Whitby 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 Committee referred the recommendation back to staff with direction to expand the review to include all options, including more than one particular site. This expanded review has concluded that transfer station options must be part of the detailed investigations regarding mixed waste pre-sort technology and potential for implementation of AD technology, including analysis of public and private sector options and partnerships.

11. Development Charges

11.1 Development Charge (DC) Act changes under Bill 73 are 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.

11.2 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.

12. Climate Change Considerations

12.1 Municipal solid waste management programs are recognized as key contributors to achieving 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 disposal. 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.

12.2 Based upon the Region's carbon footprint (2015 estimated tonnes of carbon equivalent (CO2e)), it is estimated that GHG emissions from solid waste management represent approximately 48 per cent of corporate emissions, primarily due to the Region's stewardship of seven closed landfills, which account for almost all solid waste management emissions. Combustion of fuels and energy usage at waste facilities accounts for less than one per cent of total estimated program emissions (Report #2016-COW-21).

12.3 In terms of climate adaptation and risk management, the solid waste environmental studies program is responsible for the monitoring, inspection, and remediation of Regional landfill sites, including consultations with the public and ensuring environmental protection which meets or exceeds regulatory compliance.

12.4 Adaptation-related activities include: landfill site inspections; regular environmental monitoring and reporting; well-water testing adjacent to open and closed Regional landfill sites; and repairs or improvements to protect the environment/ground water resources, including preventing rainfall infiltration and preventing leachate springs forming around landfills. Extreme precipitation significantly increases risks related to contamination migration.

12.5 The Region has also completed investigations of alternative options for the remediation of the smaller landfills, including the Blackstock landfill mining pilot. Should the Blackstock landfill mining endeavour be successful, there will be climate adaptation co-benefits as well as reduced methane emissions (up to an estimated 367 tonnes of CO2e reduction is anticipated), coupled with reduced risk of leachate migration during extreme precipitation events.

13. Cap and Trade in Ontario

13.1 Bill 172, *The Climate Change Mitigation and Low Carbon Economy Act*, received Royal Assent on May 18, 2016. This legislation and supporting regulations established Ontario's cap and trade emissions trading program with an effective date of January 1, 2017.

13.2 As a facility that emits GHG, the DYEC is captured under Ontario's carbon cap as a mandatory participant and is required to report emissions annually to the Province. As a capped facility, the DYEC must not only report annual GHG emissions but must remit carbon allowances equal to its annual carbon emissions by the end of the compliance period (2020). Currently, the Ontario government recognizes the DYEC as a facility that is providing a public service (waste disposal), and as a single large emitter, for the first compliance period (2017-2020), DYEC has received an allocation of carbon allowances free of charge based on a 2016 application for the first compliance period commencing in 2017. There is risk that the free carbon emission allowances granted to the DYEC during the first compliance period may not be extended beyond 2020. The MOECC will continue stakeholder consultation on these items throughout 2017.

13.3 As the government moves forward with its climate change agenda, there may be opportunities for waste management operations to generate carbon offset credits with projects that reduce carbon emissions (Provincial carbon offset credit consultation currently underway).

13.4 Conversely, the Region is expecting to incur additional operating costs as a result of the regulation of upstream natural gas and fuel distributors, where compliance costs associated with the acquisition of allowances is expected to be borne by end-use customers.

13.5 Additional GHG reduction funding opportunities may also be available to municipalities through cap and trade program proceeds (i.e. Greenhouse Gas Reduction Account), as identified in the Province's Climate Change Action Plan.

13.6 Regional staff will continue collaborative efforts with AMO, the Ontario Waste Management Association (OWMA) and other key stakeholders to promote broader municipal interests in the implementation of the provincial programs.

13.7 It is recommended that the Province of Ontario be requested to exempt the DYEC located in Durham Region from the cap and trade emission trading program in order to ensure the consistency and effectiveness of integrated waste management systems in achieving greenhouse gas reductions.

14. Conclusions

14.1 There are significant potential impacts as a result of changing legislation. The *Waste Free Ontario Act* will impact the Region's waste management system, which currently operates as a fully integrated system, including waste prevention, recycling, composting and disposal programs. Staff also continue to consult, pursue and participate in the recently enacted *Climate Change Mitigation and Low Carbon Economy Act, 2016* (cap and trade) to maximize waste management benefits and opportunities and minimize negative impacts. It is imperative that the waste management system continue to adapt to meet future waste management requirements effectively and efficiently.

14.2 Regional staff will remain involved in ongoing regulatory consultations and will keep Regional Council apprised of any implications from the proposed regulatory changes or other changes that may affect the 2017 Business Plan and Budget or required expenditures over the 2018 to 2026 planning period.

14.3 Final recommendations for the detailed Solid Waste Management Business Plan and Budget will be presented to Committee of the Whole and Regional Council on February 1, 2017.

15. Attachments

Attachment #1 – Existing Solid Waste Management Program Updates

Attachment #2 – Waste Collections Holiday Schedules 2017

Attachment #3 – Solid Waste Management Performance Measures

Attachment #4 – Report 2016-J-6 Recommendations (as approved by Regional Council)

Attachment #5 – Long-term Organics Management: Summary of GHD Study

Scope of Work for Financial and Technical Consulting

Attachment #6 – Solid Waste Management Data

Attachment #7 – Durham York Energy Centre (DYEC) Construction Update

Attachment #8 - List of Acronyms

Respectfully submitted,

Original signed by

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

Original signed by

_____
S. Siopis, P.Eng.
Commissioner of Works

Recommended for Presentation to Committee:

Original signed by

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

Existing Solid Waste Management Program Updates

1. Re-Use and Special Collection Events

1.1 Reuse programs offered by the Region of Durham are in partnership with local charities. All partners in the reuse programs are registered under the Canada Revenue Agency'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.

1.2 The Waste Management Division provides textile collection programs at the Region's WMFs 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 2016, just over 30 tonnes of material was collected.

1.3 ReUse Days were made permanent in 2016 with events scheduled monthly beginning in March and running through October. The events in 2017 will be held at the Waste Management Centre in Whitby in partnership with four local charities: Habitat for Humanity Durham; CDA; Goodwill; and, Salvation Army.

1.4 In 2016, 20.37 tonnes of material was collected from 426 vehicles that visited the events (at a total cost of $27,757). An estimated $44,974 in charitable donations was generated for the community.

2. Special Collection Events

2.1 In 2016, eight Compost Give Away events, four 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 15.85 tonnes from the waste stream while the WEEE collection events diverted 29.14 tonnes of end-of-life electronics for recycling. Together, residents diverted 44.99 tonnes from 1,401 participating vehicles.

2.2 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 over 4,591 vehicles attending during 2016.

2.3 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 2017 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.

2.4 In 2017, Durham Region will host, in partnership with each local municipality, eight spring Compost Give Away events, eight WEEE collection events and five MHSW collection events. A summary of the proposed 2017 Community Events is provided in Attachment #2. Details have been shared with local area municipalities and will be posted on the Region's website and the Durham Region waste web and mobile applications.

2.5 In preparation for next year, Durham has collaborated with local municipalities to discuss the Region's co-collection approach. Hosting co-collection events for MHSW and WEEE and/or Compost will allow the Region to:

A) Enhance our promotion and education efforts;
B) Promote convenience and accessibility;
C) Improve customer service; and,
D) Increase capture and resident engagement.

3. Collection

3.1 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).

3.2 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 personnel to provide all other waste collection services within their municipalities.

3.3 The Ajax/Pickering curbside collection service under a new contract that commenced on July 1, 2015, represents a cost savings of approximately $1 million annualized. The Oshawa/Whitby curbside Blue box recycling contract was retendered and commenced July 1, 2016.

3.4 The curbside collection contract for Clarington, Brock, Scugog and Uxbridge will be tendered in 2017 for collection services commencing in 2018.

4. Multi-Residential Waste Collection and Diversion

4.1 In 2016, the Region provided waste management services to 387 multi-residential properties which encompass 24,304 household units. This represents an increase of 8 buildings and 287 units over 2015. 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.

4.2 The majority of existing multi-residential properties in the Municipality of Clarington receive private solid waste collection services. In 2016, 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.

4.3 Based on the reviews to date, approximately four buildings, representing 300 dwelling units may be eligible to start receiving municipal waste collection services in 2017. 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 2017 Solid Waste Business Plan and Budget. 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 (currently part of the GHD consulting study investigation).

4.4 In 2015, expansion of the multi-residential battery collection program occurred in Uxbridge and Oshawa. A total of 86 sites are now receiving battery collection service at their buildings. Since starting this program 2,280 kilograms of batteries have been collected. The program is offered to buildings on a case-by-case basis. In 2017, further expansion of the battery program sites to multi-residential properties is anticipated based on Regional requirements, including sites with onsite supervision and internal central storage.

4.5 In November 2016, a pilot textile re-use program was launched at 12 multi-residential locations in partnership with the Canadian Diabetes Clothesline Program using specially designed white indoor collection bins. A report of the results of the pilot will be provided to Regional Council in 2017.

5. Curbside Battery Collection Program

5.1 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.

5.2 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.

5.3 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 www.durham.ca/battery.

5.4 Since the first battery collection in November 2012, it is estimated that Durham Region has diverted more than 146,000 kilograms 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 or considering programs of their own. 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.

5.5 In 2017, similar to 2016, two scheduled curbside battery collections will occur during April and November with details posted on the Region's web site and the Durham Region Waste Application and shared with social media channels. Regional staff will:

A) Collaborate with municipal Fire Departments on joint communications related to their campaigns to change batteries in smoke detectors and the Region's campaign for battery recycling;
B) Effectively utilize web site, social media and other electronic media initiatives to enhance awareness and engagement for the battery diversion program; and,
C) Discontinue the incentive program for "debagging batteries" and commence shipping "bagged batteries" to RMC to increase operational efficiencies and program sustainability.

6. Community Outreach

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

6.2 In 2016, 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 appropriate participation in waste diversion programs and promoting an understanding of and compliance with the Waste Management By-law 46-2011 (as amended).

6.3 Highlights of events and activities that took place in 2016 include:

A) Eight spring compost events, one in each municipality;
B) Eight special electronic equipment drop-off events were held and promoted throughout the year in each municipality;
C) Four municipal hazardous and special waste drop-off events;
D) Eight reuse drop-off events from March to October, partnering with local charities;
E) Promotion of waste diversion programs during National Public Works Week;
F) Waste Fair held in the Township of Uxbridge. This free, family-friendly event focused on educating residents about responsible waste management;
G) Durham Region celebrated "Waste Reduction Week" in October promoting waste reduction and diversion options for residents; and,
H) "Durham Works", the Works Department's external newsletter was distributed twice to over 220,000 households in the Region. It featured information on the Durham Region waste app, Green Bin and Blue Box Programs, curbside battery collection, programs offered at the Waste Management Facilities and updates on the DYEC.

6.4 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.

6.5 In 2016, new school programs have been developed by skilled educators, certified by the Ontario College of Teachers, for Grades K-12 using expectations outlined in the Ontario Ministry of Education curriculum documents. These programs were developed for grade divisions at the elementary level (K- grade 3, grades 4-6 and grades 7-8); and for specific courses at the secondary level (grades 9-12). Students have the opportunity to learn about Durham Region's Integrated Waste Management System through interactive presentations and hands-on activities. The content and delivery format for these education programs support the Ontario EcoSchools Program and provincial policy directions on Environmental Education and Experiential Education.

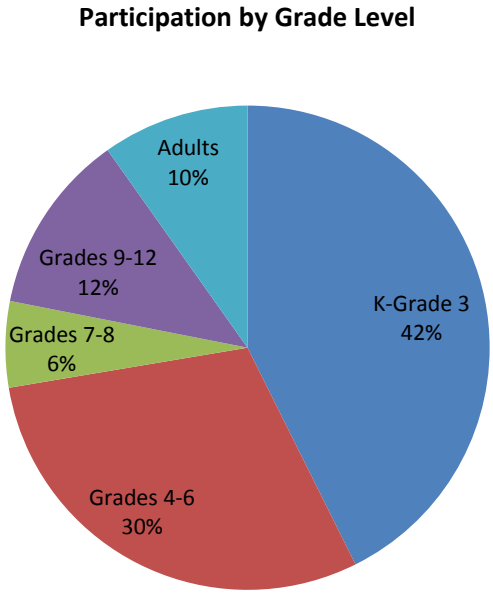
6.6 The new school programs developed were piloted in spring-fall 2016 (see Table 1 below) and based on the positive anecdotal and written feedback received to date; participating teachers have indicated that they appreciate having experienced educators in the classroom, who are comfortable teaching in the school environment and provide authentic inquiry-based environmental learning to their students.

Table 1: 2016 Participation in Durham Region Waste Education Programs

School Board/Organization	Number of Schools/Groups	Total Number of Participants
Durham District School Board (DDSB)	11	1,335
Durham Catholic District School Board (DCDSB)	8	1,065
Kawartha Pine Ridge District School Board (KPRDSB)	3	172
Private Elementary Schools	2	41
Other (e.g. community groups)	3	62
Total	27	2,675

6.7 Approximately 80 per cent of the school program requests were for the elementary grades (K-Grade 8) as shown in Chart 1. The education programs are currently being refined and finalized based on the experience of delivering them in the pilot phase.

Chart 1: 2016 Participation in Durham Region Waste Education Programs



6.8 For 2017, new online resources for Grades K-12 students and teachers will be developed to extend learning beyond the classroom presentation and improve retention of information (e.g. pre- and post-learning activities and worksheets).

6.9 In addition, specialized Teachers' Workshops will be designed and delivered at the DYEC in order to provide professional development opportunities related to Durham Region's integrated waste management system. These new initiatives will continue to build positive working relationships and "champions" amongst teachers, schools and school boards in Durham Region thereby creating a larger network to deliver our messaging in a cohesive way. Ultimately, the goal of our waste education program is to improve participation in diversion programs and reduce contamination rates.

6.10 In 2016, the Region held its fifth community Waste Fair in the Township of Uxbridge. Approximately 200 residents attended with positive feedback. 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:

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

7. Web and Mobile Applications

7.1 Since 2015, the Region has had a dedicated web and mobile waste management application. Key features of the Durham Region Waste app include:

A) 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);
B) Sign up for collection day reminders to pop up on your smartphone or tablet;
C) The "Know Before You Throw" tool allows users to search waste items to discover proper disposal methods;
D) Information on how to schedule special waste collection for bulky or porcelain items; and,
E) The ability to report collection issues directly through the app (including a photo upload function).

7.2 In 2016, the Region's Waste Management mobile application was improved with added functionality for users to schedule special curbside collections of bulky items, porcelain bathroom fixtures and waste electrical and electronic waste (WEEE). The special collection web-based and mobile "booking tool" provides confirmation notifications, instructions and reminders of their special collection, so users know how and when to set their waste out for collection. This will augment the efficiency of the Regional Municipality of Durham's existing 1-800 call-in service and provide its residents with greater accessibility to Regional services.

7.3 Since the Durham Waste App launched in September 2015, over 20,000 residents have downloaded this tool for instant, mobile, customized access to information about waste collection.

8. By-Law Enforcement Update

8.1 Durham Region's two Waste Management By-law Compliance Officers work collaboratively with the Waste Management Call Centre, the Waste Management contract administrators, and the Region's solid waste collection contractors. Officers help ensure compliance with waste management and diversion programs and to ensure the collection contractors provide the quality service that Durham residents expect. 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 or web and mobile applications. Together, the Compliance Officers service the Region's 225,000 households by splitting the Region's over 2,500 square kilometres area into two patrol areas.

8.2 Compliance Officers work closely with solid waste collection contractors to ensure prompt service and collection compliance. 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 2016, Officers resolved 929 cases addressing waste collection complaints, contractor performance related issues and by-law related cases.

8.3 Proactive action aims at identifying opportunities to take pre-emptive action against potential problems.

Table 2: Case Statistics Breakdown (January 1 to Sept 30, 2016)

Category	Cases
Garbage	208
Bulky Goods	167
White Goods	12
Porcelain	69
Blue Bin	96
Yard Waste	13
Green Bin	42
Sub Total – By-law	607
Non-By-law	322
Total	929

8.4 Approximately 759 Notices were issued to residents. Notices are 'Friendly Reminder' door hangers outlining by-law infractions and act as a guide on how to come into compliance. In some cases Officers issue multiple notices to specific addresses to achieve voluntary compliance. Officers estimate that an additional 25 per cent of the 607 By-law related cases required repeat notices.

9. Scavenging

9.1 Since 2011, Officers acted on over 197 instances of suspected scavenging. Scavenging is the unauthorized removal of waste set out for municipal collection. Typically, scavengers remove electronics, scrap metal and liquor cans/bottles. This results in a loss of potential revenue through the waste diversion systems in place. In 2016, 28 cases of scavenging were reported and staff identified various individuals who were in some cases repeat offenders. Officers use discretion issuing tickets in consideration of various relevant factors. 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. In 2016, three convictions were registered for repeat offences, with one case receiving a probation order.

9.2 Durham Region introduces municipal waste collection services to new residential developments as soon as it is safe for collection vehicles. 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 2016, By-Law Compliance Officers coordinated these services for about 3,000 new homes.

10. Multi-Residential Properties

10.1 As part of the Region's commitment to service excellence, By-law Compliance Officers are often the first point of contact for multi-residential properties that receive Regional waste collection services. Officers respond to requests for additional education for building managers and tenants, service issue resolution and promotion on the Regions progressive diversion programs. These calls are currently not tracked, however staff is currently making changes to the call management system to better track these calls. Officers also assist in the review of new applications for Regional waste collection service.

11. Neighborhood Education Blitzes

11.1 From time to time, officers identify specific issues that require special attention to help address concerns and problems faced by the public. These issues are targeted in many ways by other areas in the department by various mediums. By-law Compliance Officers participate in these efforts by conducting education blitzes where the Friendly Reminder door hanger is used with specific messaging directed to residents affected. Examples of issues dealt with to date include:

A) Avoiding litter on windy days. Stacking Blue Boxes and setting out the morning of collection as opposed to the night before to prevent litter;
B) Proper waste set out/placement; and,
C) Severe weather–special clean up service offered/instructions for set out.

11.2 In 2016, 19 neighbourhood educational blitzes were conducted to achieve compliance for recycling, garbage, green bin, and leaf and yard waste related issues. A total 925 notices were delivered identifying infractions.

Regional Municipality of Durham Waste Management Operations
Re-scheduling of Waste Collections January 2017 to November 2017

TOWN OF AJAX

- Green Bin and Blue Box scheduled for **Friday, April 14, 2017 (Good Friday)** will be moved to the next day **Saturday, April 15, 2017**.

CITY OF PICKERING

- Garbage, Green Bin, Blue Box and Yard Waste scheduled for **Friday, April 14, 2017 (Good Friday)** will be moved to the next day **Saturday, April 15, 2017**.

TOWNSHIPS OF BROCK, SCUGOG, UXBRIDGE

- Garbage, Green Bin, Blue Box and Yard Waste scheduled for **Friday, April 14, 2017 (Good Friday)** will be moved to the next day **Saturday, April 15, 2017**.

MUNICIPALITY OF CLARINGTON

- Green Bin and Blue Box scheduled for **Friday, April 14, 2017 (Good Friday)** will be moved to the next day **Saturday, April 15, 2017**.

TOWN OF WHITBY

The Town of Whitby produces their calendars, which run **July to June** annually. In the event of a statutory Holiday, a "day-shift" schedule will be enacted as follows (*some dates may be tentative, pending confirmation from local municipality):

- **Monday, January 2, 2017 (New Year's Day - Observed)** - all waste collection will shift one day forward. This means that residents with collection scheduled for Monday, January 2 will temporarily have their collection moved to Tuesday, January 3. This shift will continue throughout the week until collection scheduled for Friday, January 6 is moved to Saturday, January 7.

- **Monday, February 20, 2017 (Family Day)** - all waste collection will shift one day forward. This means that residents with collection scheduled for Monday, February 20 will temporarily have their collection moved to Tuesday, February 21. This shift will continue throughout the week until collection scheduled for Friday, February 24 is moved to Saturday, February 25.

- **Friday, April 14, 2017 (Good Friday)** - all waste collection will shift one day forward. This means that residents with collection scheduled for Friday, April 14 will temporarily have their collection moved to Saturday, April 15.

- **Monday, April 17, 2017 (Easter Monday)** - all waste collection will shift one day forward. This means that residents with collection scheduled for Monday, April 17 will temporarily have their collection moved to Tuesday, April 18. This shift will continue throughout the week until collection scheduled for Friday, April 21 is moved to Saturday, April 22.

- **Monday, May 22, 2017 (Victoria Day)** - all waste collection will shift one day forward. This means that residents with collection scheduled for Monday, May 22 will temporarily have their collection moved to Tuesday, May 23. This shift will continue throughout the week until collection scheduled for Friday, May 26 is moved to Saturday, May 27.

CITY OF OSHAWA

The City of Oshawa produces their calendars, which run **July to June** annually. In the event of a statutory Holiday, a “day-shift” schedule will be enacted as follows (*some dates may be tentative, pending confirmation from local municipality):

- **Monday, February 20, 2017 (Family Day)** - all waste collection will shift one day forward. This means that residents with collection scheduled for Monday, February 20 will temporarily have their collection moved to Tuesday, February 21. This shift will continue throughout the week until collection scheduled for Friday, February 24 is moved to Saturday, February 25.

- **Friday, April 14, 2017 (Good Friday)** - all waste collection will shift one day forward. This means that residents with collection scheduled for Friday, April 14 will temporarily have their collection moved to Saturday, April 15.

- **Monday, April 17, 2017 (Easter Monday)** - all waste collection will shift one day forward. This means that residents with collection scheduled for Monday, April 17 will temporarily have their collection moved to Tuesday, April 18. This shift will continue throughout the week until collection scheduled for Friday, April 21 is moved to Saturday, April 22.

- **Monday, May 22, 2017 (Victoria Day)** - all waste collection will shift one day forward. This means that residents with collection scheduled for Monday, May 22 will temporarily have their collection moved to Tuesday, May 23. This shift will continue throughout the week until collection scheduled for Friday, May 26 is moved to Saturday, May 27.

Solid Waste Management Performance Measures

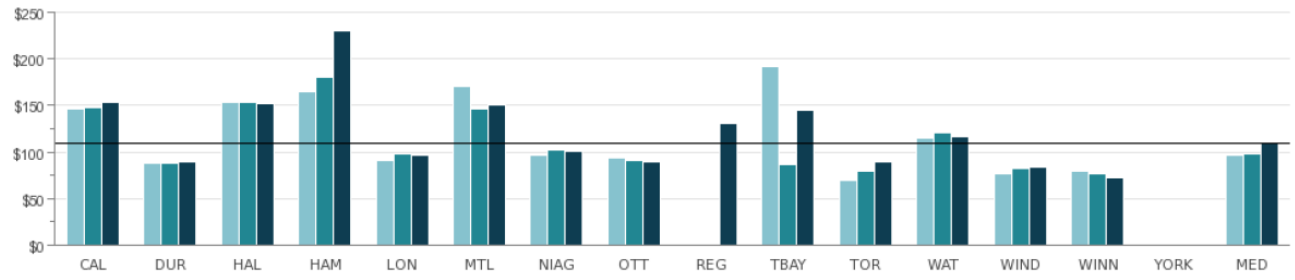
Once programs are implemented, performance is monitored, measured and evaluated. Performance measurement processes at Durham Region include:

- Measures incorporated into the annual detailed business plan and budget;
- 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 Municipal Benchmarking Network Canada Performance Measurement Report.

The Municipal Benchmarking Network Canada 2015 Performance Measurement Report results are available for over 20 Durham Region service areas, including Solid Waste Management. Compared to peers, Durham Region's 2015 collection costs are low, totaling $90 per tonne of garbage collected, compared to the median cost of $109 per tonne for the peer group overall.

Fig. 34.5 Total Cost for Garbage Collection per Tonne - All Property Classes

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



2013	$147	$88	$153	$165	$91	$170	$97	$93	N/A	$192	$69	$115	$77	$80	N/A	$97
2014	$148	$88	$153	$180	$98	$147	$102	$91	N/A	$87	$79	$120	$82	$76	N/A	$98
2015	$153	$90	$152	$230	$96	$150	$101	$90	$130	$145	$89	$117	$84	$72	N/A	$109

Source: SWST311T (Efficiency)

Comments:

York Region operates a two-tier system, which means they are not responsible for curbside collection; however they are responsible for all processing. Therefore, York is able to report the total tonnes collected (see Fig 34.1 – SWST205); but not able to report the total cost.

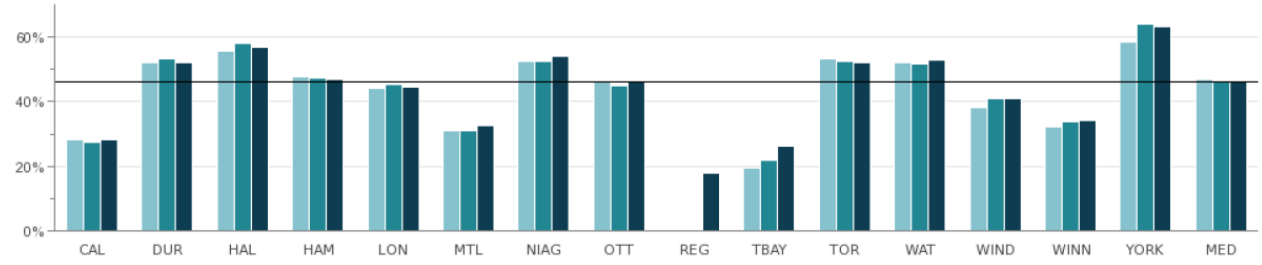
The City of Thunder Bay collected less waste at the curb, while cost remained relatively the same which resulted in an increased cost per tonne.

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.

Durham Region remains above the median diversion rate of its peers (a median of 46.2 per cent diversion compared to Durham Region's 52 per cent diversion rate for 2015).

Fig. 34.4 Percent of Residential Solid Waste Diverted

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.



	CAL	DUR	HAL	HAM	LON	MTL	NIAG	OTT	REG	TBAY	TOR	WAT	WIND	WINN	YORK	MED
2013	28.2%	52.3%	55.8%	47.8%	44.1%	31.0%	52.5%	46.4%	N/A	19.5%	53.3%	52.3%	38.3%	32.0%	58.4%	47.1%
2014	27.5%	53.2%	58.2%	47.3%	45.4%	30.9%	52.4%	45.0%	N/A	21.8%	52.7%	51.7%	41.1%	33.6%	64.2%	46.4%
2015	28.3%	52.0%	56.9%	47.1%	44.5%	32.5%	54.3%	46.2%	17.8%	26.1%	52.3%	53.0%	40.9%	34.3%	63.5%	46.2%

Source: SWST105M (Community Impact)

Durham Region's 2015 costs for waste disposal were above its peers at approximately $159 per tonne; compared to the median of $92 per tonne.

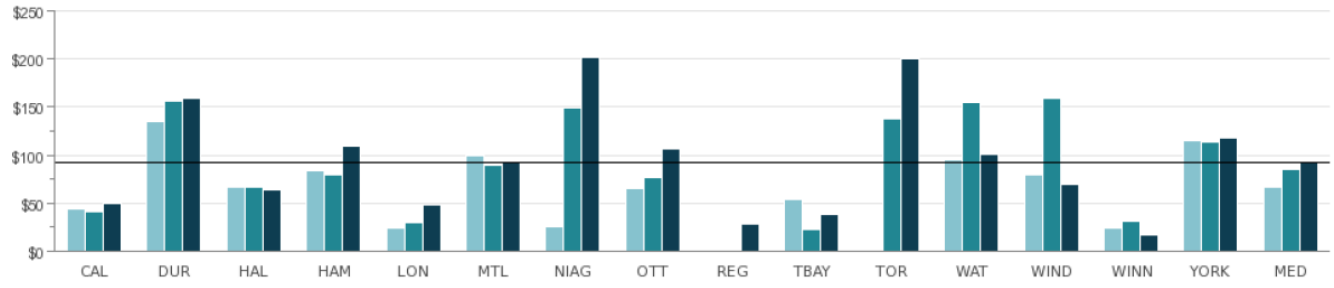
Disposal costs are influenced by many factors including availability and distance to disposal sites, fuel costs and disposal site requirements. Also influencing disposal costs, the Region must monitor and provide perpetual care to seven existing closed landfill sites. Landfill sites represent long-term liabilities and continued environmental protection and periodic remediation, including surface and groundwater protection measures, are required periodically over the long-term.

Fig. 34.6 Total Cost for Solid Waste (All Streams) Disposal per Tonne - All Property Classes

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

Other impacts such as additional costs of transporting waste outside a community, aging infrastructure, capital costs, and the cost associated with the incineration of garbage, service agreements, increase in leachate treatment and fluctuating fuel costs can impact the results. In addition, declining landfill capacities typically result in increased landfill rates.

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



2013	$44	$135	$66	$83	$24	$99	$25	$65	N/A	$54	N/A	$95	$80	$24	$115	$66
2014	$41	$157	$66	$79	$30	$90	$149	$76	N/A	$23	$138	$155	$159	$31	$114	$85
2015	$50	$159	$63	$109	$48	$92	$202	$107	$28	$38	$200	$101	$70	$17	$118	$92

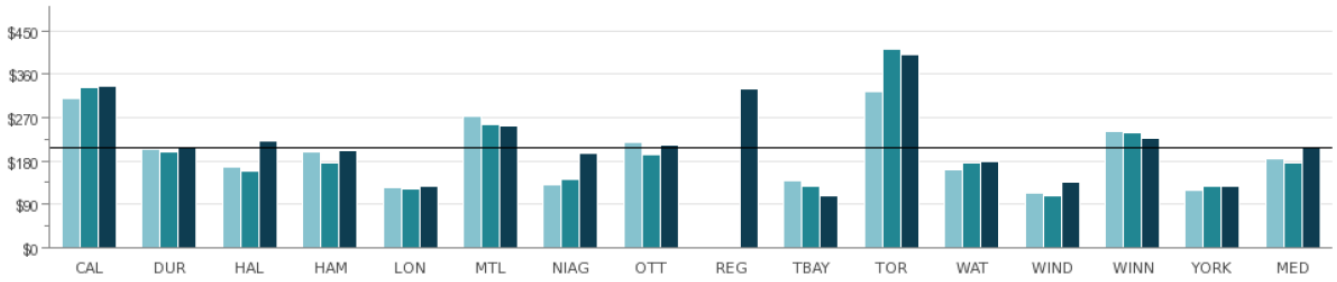
Source: SWST325T (Efficiency)

Comment: The City of Toronto used a new cost methodology for 2014 and 2015; and results for 2013 are currently under review.

Durham's cost to divert a tonne of garbage was at the peer group median of $208 per tonne in 2015. Cost differences across municipalities reflect diverse service levels and differing circumstances, 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).

Fig. 34.7 Total Cost for Solid Waste Diversion per Tonne - All Property Classes

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



2013	$309	$205	$167	$199	$124	$273	$131	$218	N/A	$138	$325	$162	$113	$240	$119	$183
2014	$332	$199	$159	$175	$123	$257	$142	$194	N/A	$126	$413	$175	$108	$238	$128	$175
2015	$335	$208	$221	$202	$126	$254	$196	$214	$330	$106	$401	$179	$137	$227	$126	$208

Source: SWST330T (Efficiency)

Regional Response to the Province on Ontario's Proposed *Waste-Free Ontario Act*, and associated *Resource Recovery and Circular Economy Act and Waste Diversion Transition Act* Environmental Bill of Rights (EBR) Posting #012-5832 (2016-J-6)

RECOMMENDATIONS TO COUNCIL

A) That Report #2016-J-6 be submitted to the province in response to Environmental Bill of Rights (EBR) Posting #012-5832, the '*Waste-Free Ontario Act*'; and

B) That based on discussions with the Association of Municipalities of Ontario (AMO), the following resolution be adopted and forwarded to the Honourable Kathleen Wynne, Premier:

Whereas waste materials can become valuable resources and enhanced producer responsibility could provide significant environmental benefits should producers be encouraged to innovate to reduce waste, develop more easily recycled packaging, and work with municipalities to enhance and/or fund enhanced options for the collection and processing of waste materials;

Whereas municipalities have no control over the form of municipal solid waste generated from packaging and products entering their jurisdiction, and yet municipal taxpayers continue to bear greater than 50 per cent of the costs for the disposal and recycling of packaging and print materials that circulate within their waste streams;

Whereas producer responsibility provides that producers bear responsibility for 100 per cent of the costs of designated wastes and their end-of-life management and municipalities should not bear any net cost for the management of these materials which are becoming increasingly complex and expensive to recycle, reclaim and/or dispose of;

Therefore be it resolved that the Regional Municipality of Durham calls on the Ontario Government to ensure the proposed '*Waste-Free Ontario Act*' (Bill 151) results in legislation which not only replaces the current *Waste Diversion Act* to ensure full producer responsibility, but that in order to ensure service levels to Ontario residents are equal to, or better than existing service levels provided, legislation be based on:

i) A made-in-Ontario framework that respects the complexity, functionality and success of long-standing municipal integrated waste management systems and service levels;

ii) Evidence-based decision making to ensure there are no unintended consequences to municipalities;

iii) A fully funded role for municipalities, ensuring producers take 100 per cent responsibility for the end-of-life costs of designated wastes including disposal and litter operations, with full and fair compensation to municipalities for any municipal services or infrastructure provided (including compensation for stranded assets);

iv) The recognition that residual municipal solid waste is a less carbon intensive fuel than traditional fossil fuels and accept energy recovery as a key element of diversion for the residual waste material; and

v) All energy extraction / recycling methods being treated equally, and the beneficial use of energy-from-waste residuals (ash and metal) should be encouraged for use in production processes to replace elements in new products and that the definition of diversion include all energy recovery solutions; and

C) That Report #2016-J-6 be forwarded to the Region's local municipalities, the Association of Municipalities of Ontario, the Ontario Waste Management Association, the Government of Ontario Ministers of the Environment and Climate Change and Municipal Affairs and Housing, and Durham Members of Provincial Parliament.

Long-term Organics Management: Summary of GHD Study Scope of Work for Financial and Technical Consulting

Part 1 - Background Research and Technical Analyses, including the following:

- Review of previous anaerobic digestion, waste transfer and other relevant studies of the Region's integrated waste management system as completed through various consulting assignments; and,
- Identification, definition and comparison of available mixed waste pre-sort and AD technical options that could assist the Region in the development of a prudent long-term organics management plan, including management of single family and multi-family organics waste streams, and including options to capture additional recyclables from the current residual waste streams.

Part 2 - Detailed options analysis, business case analysis and service delivery (public-private) analysis of preferred options for organics management, including those identified in Part 1 and other viable options with:

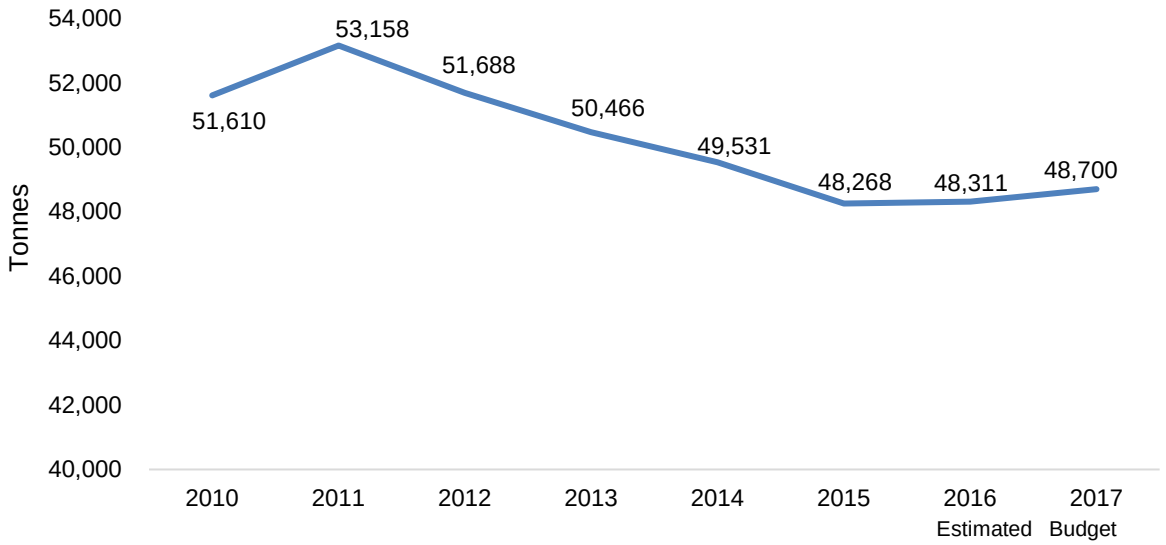
- Evaluation of identified viable options considering environmental implications, diversion potential, energy revenue potential, implications for Regional control and flexibility, risk assessment and financial implications, including estimated costs per tonne.
- Comparison of the two best options to the status quo integrated waste management system through a detailed business case analysis conducted over a 20-year horizon, based on discounted life-cycle costs and benefits/revenues for each organics management option;
- Sensitivity analysis of key variables and assumptions; and,
- Assessment of potential service delivery models (public, private and public-private (P3)) for options related to the development of any recommended new infrastructure, considering risk mitigation, capital and operating investment requirements, industry best practice, the level of proprietary technology, ownership and control considerations, and consistency with Regional roles, responsibilities, mandate and expertise.

Part 3 - Additional Regional Council approvals will be required to proceed to Part 3 of the GHD Study, at an estimated additional cost of $0.8 million (included within the current capital projection for 2017, subject to approval). Part 3 comprises legislative and regulatory review and confirmation, assistance developing any required contractual, purchasing and/or regulatory documentation necessary to move forward with Part 1 and 2 recommendations, and siting evaluations if required.

Solid Waste Management Data

1. Since peaking in 2006 at 55,511 tonnes, municipal Blue Box tonnages have been declining with significant impacts to the traditional diversion rate calculation. The 2017 Budget projection for Blue Box is just 48,700 tonnes, consistent with actual tonnages since 2015 and eight per cent lower than the 53,158 tonne recorded in 2011 as shown in the following chart.

Chart 1: Blue Box Diversion Tonnages (2010 to 2015 actuals, 2016 Estimated Actuals and proposed 2017 Budget)



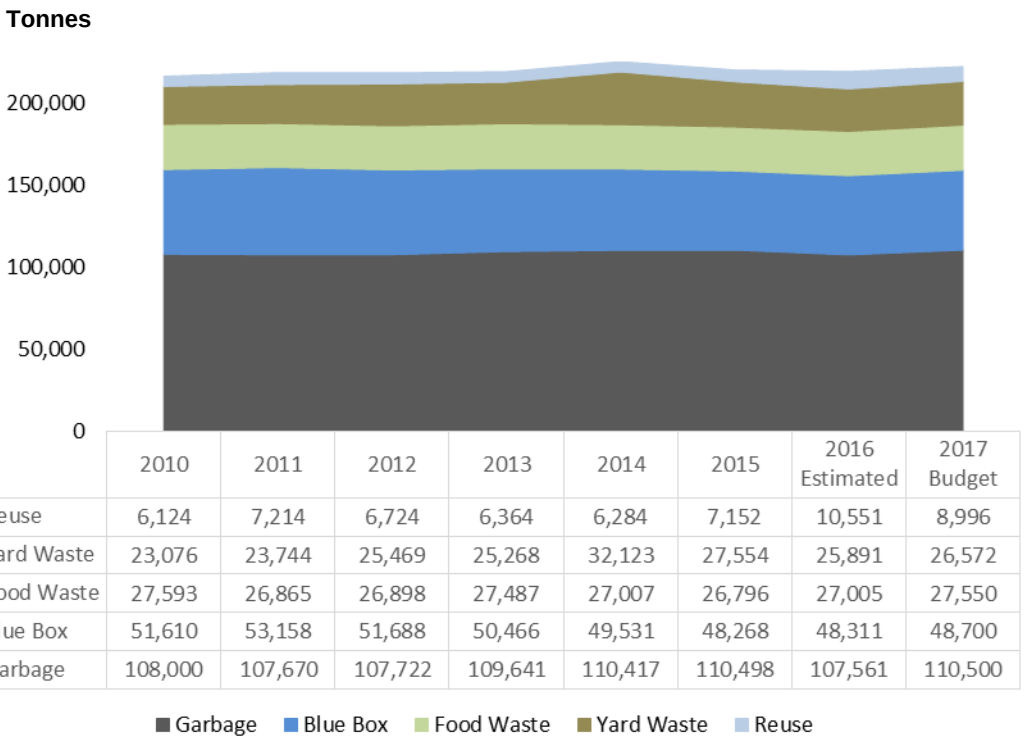
1.1 Both overall tonnages and stop count growth have been relatively flat in recent years with some reduction to processing and disposal expenditure growth pressures. Over the previous decade, overall tonnage growth has averaged approximately 0.4 per cent growth, compared to approximately two per cent tonnage growth per year over previous decades.

1.2 Reduced growth tonnages result from several factors including: provincial product stewardship programs and return to retail programs (such as the 'Bag It Back' program for LCBO containers), industry product and packaging lightweighting, slower economic growth, and the declining tonnage of waste being generated per household.

1.3 The 2016 tonnage estimated actuals, including Blue Box, Green Bin organics, yard waste (including Christmas trees), reuse materials, and garbage totals 219,319 tonnes.

1.4 Chart 2 below demonstrates relatively flat overall tonnage growth since 2010, reflecting declining Blue Box tonnages received and processed through the municipal solid waste management program as well as lower tonnes per household generated overall which has offset household growth.

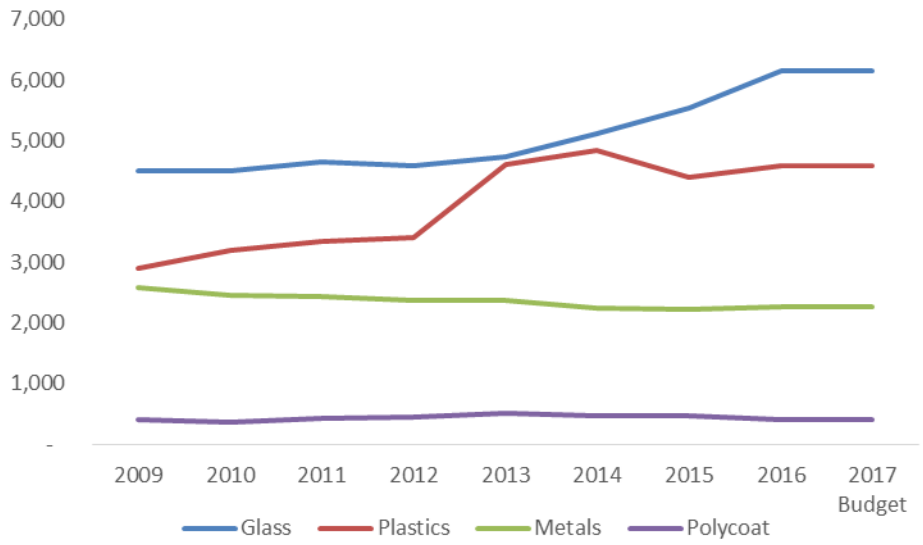
Chart 2: Diversion and Residual Garbage Waste Streams (2010 to 2015 Actuals, 2016 Estimated and 2017 Budget)



	2010	2011	2012	2013	2014	2015	2016 Estimated	2017 Budget
Reuse	6,124	7,214	6,724	6,364	6,284	7,152	10,551	8,996
Yard Waste	23,076	23,744	25,469	25,268	32,123	27,554	25,891	26,572
Food Waste	27,593	26,865	26,898	27,487	27,007	26,796	27,005	27,550
Blue Box	51,610	53,158	51,688	50,466	49,531	48,268	48,311	48,700
Garbage	108,000	107,670	107,722	109,641	110,417	110,498	107,561	110,500

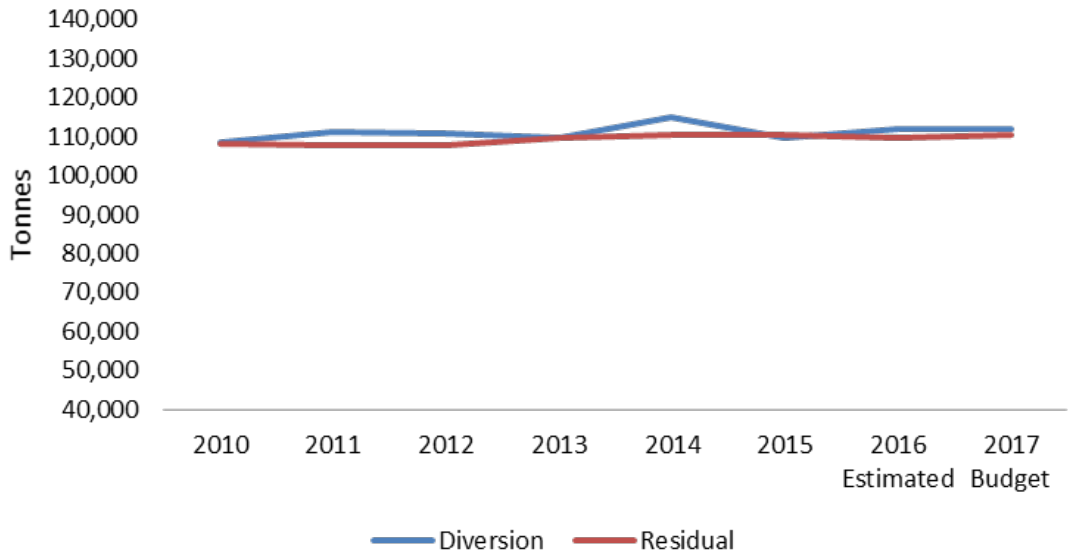
1.5 Chart 3 following illustrates a rising trend in actual volumes of both glass and plastics within the Blue Box. In 2015, the Region saw the highest volume of light weight recyclables managed at the Region's material recovery facility (MRF) since it was built in 2007.

Chart 3
Container Material Trends
2010 to 2015 Actuals, 2016 Estimated and 2017 Budget Tonnes



1.6 The following two charts demonstrate diversion and residual garbage trends together (tonnages and overall diversion rate). The overall diversion rate has been consistent since 2010 (ranging between 52 per cent and 53 per cent). The most significant diversion increases occurred between 2004 and 2009, with 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, due to the 2013 ice storm clean-up rather than a changed program or participation level.

Chart 4
Diversion Versus Residual Garbage Tonnes
(2010 to 2015 Actuals, 2016 estimated and 2017 Budget)

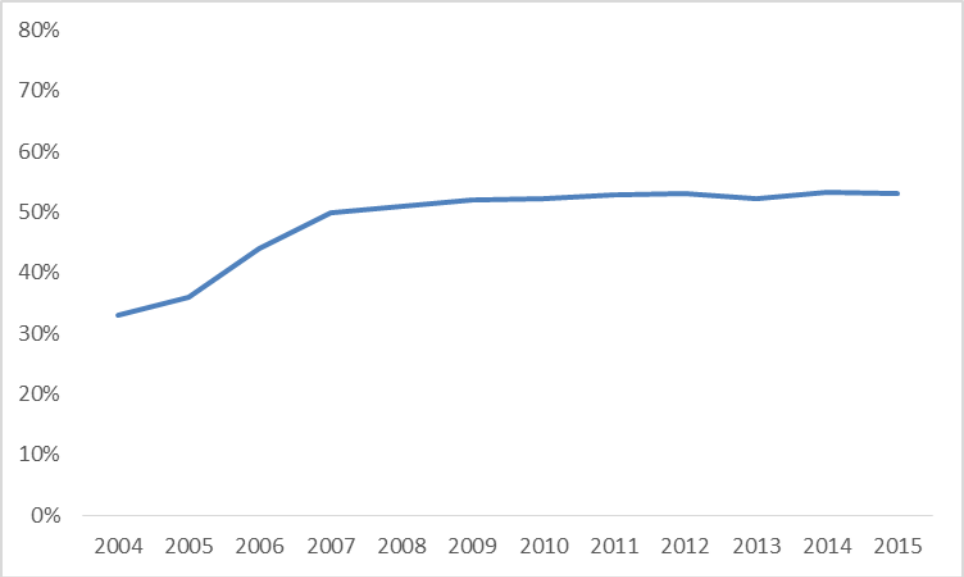


Note: Diversion tonnes include managed Blue Box, Green Bin, Yard Waste, Christmas trees, Reuse programs and exclude diversion attributed to grass cycling and composting programs.

2. Diversion Data

2.1 Chart 5 below provides the actual diversion rate trends from 2004 to 2015.

Chart 5
Region WDO Diversion Rate
(2004 to 2015 Actuals)



2.2 The most significant diversion increases occurred between 2004 and 2007, with significant expansions due to the introduction of the Green Bin organics program and subsequent expansions to Blue Box program materials and diversion collection programs. The overall diversion rate has remained between 52 per cent and 53 per cent since 2009, despite the decreasing blue box material tonnage, which was offset by higher yard waste and reuse tonnages.

2.3 The municipal diversion focus going forward will be on capturing more of the organics waste stream and diverting it from disposal. This focus is supported by previous Durham Region waste composition studies which consistently show that organics provide the most significant diversion potential, with a high proportion of organics being found within both the multi-residential and single family garbage waste stream.

3. Collection Stop Counts

3.1 Regional Waste By-law #46-2011 directs how municipal waste services are provided to new homes and/or multi-residential properties. New single family residents 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 2016, over 5,000 diversion kits were distributed related to new and resale Durham households.

3.2 The Region utilizes stop count growth (ie. the number of households) as determined by Municipal Property Assessment Corporation (MPAC) data as a

costing element for collection contract stop count adjustments within collection contracts. Table 1 provides contractual stop count actuals from 2011 to 2015, 2016 (estimated) and 2017 Budget stops.

Table 1: Actual Collection Stops
(2011 to 2015 Actuals, 2016 Estimated and 2017 Budget)

	2011	2012	2013	2014	2015	2016 Estimated	2017 Budget
Ajax	32,308	33,021	33,640	34,229	34,774	35,240	36,230
Brock	4,712	4,702	4,710	4,722	4,739	4,767	4,770
Clarington	28,467	29,106	29,678	30,218	30,751	31,348	32,190
Oshawa	45,823	46,188	46,645	47,230	47,878	48,548	49,010
Pickering	25,550	25,969	26,194	26,406	26,885	27,191	27,480
Scugog	8,101	8,187	8,194	8,206	8,245	8,304	8,320
Uxbridge	7,039	7,085	7,095	7,125	7,221	7,342	7,400
Whitby	36,933	37,647	37,987	38,262	38,455	38,958	39,390
Total	**188,933**	**191,905**	**194,143**	**196,398**	**198,948**	**201,698**	**204,790**

3.3 Collection service stop count growth in 2017 is projected at 1.5 per cent, slightly above the five-year average growth rate of 1.3 per cent.

3.4 Over the previous five years, overall tonnage growth has averaged approximately 0.4 per cent growth, compared to approximately two per cent tonnage growth per year over previous decades; however this does not necessarily mean that less waste is being managed in terms of volumes. In 2015 the Region saw the highest volume of light weight recyclables managed at the Region's material recovery facility (MRF) since it was built in 2007.

Table 2:
Regional Solid Waste Tonnages
(2011 to 2015 Actuals, 2016 Estimated and 2017 Budget)

	2011	2012	2013	2014	2015	Estimated 2016	Budget 2017
Blue Box	53,158	51,688	50,466	49,531	48,268	48,311	48,700
Food Waste	26,865	26,898	27,487	27,007	26,796	27,005	27,550
Yard Waste [(1)]	23,744	25,469	25,268	32,123	27,554	25,891	26,572
Reuse programs	7,214	6,724	6,364	6,284	7,152	10,551	8,996
Garbage	107,670	107,722	109,641	110,417	110,498	107,561	110,500
TOTAL	**218,651**	**218,501**	**219,226**	**225,362**	**220,268**	**219,319**	**222,318**

Notes:

1 The increased yard waste tonnages in 2014 were due to the 2013 ice storm clean-up. Yard waste includes Christmas tree collections.

2 Although included in the diversion rate calculation, the table above excludes backyard composting and grass cycling credits (representing an estimated 11,927 tonnes for 2016).

3 Figures may not add due to rounding.

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 2016 Budget for commodity revenues generated from the curbside collection of fibres, plastics and metals was set at $4.6 million. Including analysis of 2016 data, an overall break even position is anticipated for the full-year. The current forecast for 2017 Budget for materials commodity revenues will be based on average actual revenues received over 2015 and 2016, and staff analysis of market trends, and will be in the range of approximately $5 million.

4.3 Plastics and metals are 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, has 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.

Durham York Energy Centre (DYEC) Construction Update

1. Purpose

1.1 This attachment provides a construction project update, including DYEC site activities since the previous update report in September 2016.

2. Background

2.1 Covanta was issued the Acceptance Certificate effective November 23, 2016 for the DYEC construction completion. With the issuance of the Acceptance Certificate, the Owner is obligated to release to Covanta the *Construction Lien Act* (CLA) holdback of $12.77 million. At time of Acceptance Certificate issuance, Covanta provided a two-year construction guarantee in the form of a letter of credit in the amount of $12.65 million, as permitted under the Project Agreement.

2.2 In the event Covanta fails to fulfill certain obligations under the Project Agreement, there is a two-year Recall Period post final Acceptance Certificate, during which the Owner may set off against the construction guarantee to ensure compliance with performance guarantees or to correct facility defects. Should any equipment be repaired or replaced during this period, the two-year period in respect to that portion of the work or equipment, will automatically recommence extending a further two-years from the date of repair or replacement.

2.3 Accordingly, the Regions of Durham and York (Owner) have paid Covanta Durham York Renewable Energy Ltd. (Covanta) all contractually defined construction milestone payments including holdbacks for completion of the DYEC Design Build Work. The final total value of the nine construction milestone payments was $252.99 million (Durham share - $191.47 million; York share - $61.52 million), which includes the additional escalation fixed at Notice to Proceed of $2.65 million, net of the reduction to the contract value of $2.5 million as a result of the settlement reached with Covanta related to the non-conformance identified for the western refuse crane laydown area and minor scope change reductions as reported upon in the earlier reports.

3. Environmental Monitoring

3.1 The 2016 environmental monitoring data will be submitted to the MOECC in the annual reporting for ambient air, groundwater, surface water and soil by April 2017. To-date, all regulatory parameters were within their respective limits.

3.2 It is recommended that additional operational costs totaling up to $120,000 to fund environmental monitoring around the site during 2017, including review and evaluation of ambient air data received to date ($50,000); continuation of fence line monitoring ($40,000); and to undertake a peer review of AMESA results ($30,000) be referred to the 2017 Business Plan and Budget process for approval.

4. Clarington Host Community Agreement: Off-site Works

4.1 Previous reports indicated delays related to construction of the tunnel and storm sewer under the Canadian National Railway Company (CN Rail) line. Final design work for the required tunnel has been completed, with this portion of the work to be re-tendered in the competitive market. This off-site work carries financial risks related to final tender results which are unknown at this time; however, as previously reported, an amount of $1.1 million for this work has been included in the projected Host Community Agreement (HCA) and Site Servicing costs.

4.2 In order to complete the construction of Energy Drive, approximately $300,000 will be needed to apply the final asphalt layer to the surface. The cost and financing required will be confirmed when tendered, with costs and financing from the Solid Waste Management reserve fund.

5. Co-owner's Agreement

5.1 Negotiations with York Region continue and Durham staff take the position that the current project cost summary is consistent with both the executed Project Agreement and the Co-Owners Agreement. In particular, York staff concerns regarding the 50/50 capital cost share commitments related to facility oversizing and HCA works present potential risk to Durham's final project budget.

5.2 In addition, staff are in the process of determining how much, if any, of the by-pass waste was attributable to York and, in turn, the appropriate share for York in the settlement of by-pass waste.

6. Contractual Year-End Reconciliation

6.1 As part of the Project Agreement, the previous year's operating fee must be reconciled within 60 days of each calendar year-end. The Owner and Covanta are currently in discussions regarding 2016 year-end reconciliations which include: finalization of annual adjustments based upon contractual inflationary benchmarks; waste supply commitments, deliveries and/or bypass amounts and responsibilities based on the Project Agreement; and, energy production and related obligations.

6.2 There are also risks regarding Project Agreement disposal obligations associated with 2016 bypass waste during the period of the Boiler shutdown (i.e. waste "received" but not combusted).

7. DYEC Operating Outlook

7.1 The DYEC started Commercial Operations on January 29, 2016 and received final Acceptance Certificate on November 23, 2016. The 2017 Budget will be based on the first full year of operations, with five years of net operational costs projected as noted within Table 1 below (subject to changes to actual annual escalation benchmarks and operations).

Table 1
DYEC Operating Cost Projections (2017-2021)
($millions)

Durham DYEC Operations [1]	2017	2018	2019	2020	2021
Covanta Operating Fee (Durham & York)	15.99	16.26	16.54	16.83	17.12
Durham Property Taxes	0.81	0.83	0.85	0.87	0.89
Other Non-Covanta Operating Costs (gross costs)	1.47	1.53	1.43	1.54	1.44
York Covanta Fee/Property Tax Recovery	(3.60)	(3.66)	(3.72)	(3.79)	(3.86)
York Non-Covanta Recovery	(0.31)	(0.32)	(0.30)	(0.32)	(0.30)
Sub-total DYEC Operations Costs	**14.37**	**14.64**	**14.80**	**15.13**	**15.30**
DURHAM DYEC OPERATING REVENUES					
EFW Electricity Revenues (IESO)	(6.97)	(7.01)	(7.06)	(7.10)	(7.15)
EFW Materials Recovery Revenues	(0.35)	(0.36)	(0.36)	(0.37)	(0.38)
Sub-total EFW Operating Revenues	**(7.32)**	**(7.37)**	**(7.42)**	**(7.47)**	**(7.52)**
DYEC NET COST (DURHAM ONLY)	**7.05**	**7.27**	**7.38**	**7.66**	**7.78**

[1] This table excludes haulage costs for the delivery of waste to the DYEC.

8. Budget Status

8.1 The following table represents the EFW construction cost components, including the project budget established in 2009 and total projected actuals.

Table 2
Construction Project Budget and Projected Actual

Notes		Project Budget (Report 2009-COW-3)	Previously Approved Changes (cumulative)	Project Expenses / Adjustments (this report)	Projected Actual
		($ millions)	($ millions)	($ millions)	($ millions)
	CONSTRUCTION PROJECT Contractor Costs				
1	Covanta Construction Costs (incl. $8.11 mil. escalation)	243.91	-	-	243.91
2	Additional Escalation - fixed at Notice to Proceed	-	2.65	-	2.65
3	Architectural Enhancements	9.00	-	-	9.00
	Scope Change	-	(0.07)	-	(0.07)
5	Scope of Work Adjustment (West Crane laydown area)	-	(2.50)	-	(2.50)
	Sub-total Construction Costs	252.91	0.08	-	252.99
	Other Project Costs				
6	Owner's Consultant	5.60	2.64	-	8.24
7	Legal Fees	-	0.45	-	0.45
8	HCA/Site Servicing Costs	13.08	9.50	0.30	22.88
9	Utility Connection Costs	0.90	4.62	-	5.52
	Net HST	-	5.10	-	5.10
	Sub-total Other Project Costs	19.58	22.31	0.30	42.19
	TOTAL CONSTRUCTION COSTS (including applicable taxes)	**272.49**	**22.39**	**0.30**	**295.18**

Construction Project Budget Notes:

1 **Covanta Construction Costs (incl. $8.11 mil. escalation) –** Fixed lump sum price contract as approved by Regional Council (Report 2009-COW-3)

2 **Additional Escalation – fixed at Notice to Proceed** - The construction inflation was fixed at Notice to Proceed in August 2011 and exceeded the amount estimated for the budget in Report 2009-COW-3, due to the later start date.

3 **Architectural Enhancements** – As required under the RFP, a $9 million cash allowance was provided for architectural enhancements and the preferred design was forwarded to Regional Council under Report 2011-J-15.

4 **Scope Change** - Scope changes were to reduce the Covanta contract by $38,355 due to the Hydro One Network requirements for the electrical switchyard and to remove the construction of the facility truck entranceway from the Covanta contract, as entranceway was constructed by the host community servicing contractor.

5 **Scope of Work Adjustment (West Crane Laydown area)** - In January 2016, Regional Council approved the reduction of the total lump sum contract cost by $2.5 million in settlement of the non-conformance issue for the west crane laydown area. (Report #2016-COW-2).

6 **Owner's Consultant** - HDR Corporation is technical advisor and owners' consultant. Projected actual includes the original approved contract of $5.6 million, plus amounts approved and requested for delay in project, oversight of Source Tests, Abatement Plan implementation and review of construction activities necessary to achieve finalization of the Acceptance Certificate: $195,000 (2015-J-9), $450,000 (2015-J-40), $1.1 million (2016-COW-1) and $890,000 (2016-COW-18).

7 **Legal Fees** - Borden Ladner Gervais was retained to provide legal guidance on issues related to commissioning and acceptance test at an amount up to $250,000 (2015-J-40), plus an additional $200,000 (2016-COW-1).

8 **HCA / Site Servicing Costs** - Host Community Agreement work / site servicing costs include land acquisition and related legal fees, construction of off-site infrastructure, air monitoring and other miscellaneous costs and was originally budgeted at $13.08 million. The breakdown of the HCA /Site Servicing costs is as follows:

	$ (millions)
Lands expropriation, including legal costs	13.10
Site Servicing Contract (Coco Paving)	5.92
Ambient Air Monitoring	1.03
Storm water management (tunnel under CN rail) estimate	1.10
Independent Engineer - IESO requirement	0.07
Other site servicing costs (HDR Design, Engineering etc)	1.36
Final road surfacing estimate	0.30
	22.88

9 **Utility Connection Costs** - The final actual cost reconciliation for the Enbridge natural gas pipeline connection is $4.78 million. Final costs of the Hydro One Networks Inc. hydro connection is $740,000. The total for utility connections (including permits and miscellaneous fees) is $5.52 million.

8.2 The following table represents the financing of the EFW construction cost components, including the project budget established in 2009 and total financing required based on the updated cost estimates.

Table 3
Construction Project Financing and Projected Actual

Notes		Project Budget (Report 2009-COW-3)	Additional Financing Required (previous update)	Additional Financing (this report)	Total Financing
		($ millions)	($ millions)	($ millions)	($ millions)
	DURHAM'S SHARE				
1	Federal Gas Tax - Upfront	100.00	1.03	-	101.03
2	Federal Gas Tax - Debentures	113.10	(6.49)		106.61
3	Solid Waste Management Reserve Fund	-	8.81	0.15	8.96
4	Liquidated Damages	-	2.70	-	2.70
5	Other revenue	1.63	1.67	-	3.30
6	Rail Crossing - to be determined	-	0.80	-	0.80
	TOTAL FINANCING	**214.73**	**8.52**	**0.15**	**223.40**
	YORK'S SHARE	**57.76**	**13.87**	**0.15**	**71.78**

Construction Project Financing Notes:

1 **Upfront Federal Gas Tax** – As approved in 2009-COW-03, an amount of approximately $100 million of Federal Gas Tax funding was provided as upfront financing to be applied to DYEC project costs commencing in 2011.

2 **Debentures** - A $67 million debenture was issued in 2012 to finance 2013 project capital costs. A further debenture of $25 million was issued in 2014 to fund 2014 project capital costs. Debt costs will be paid from Federal Gas Tax.

3 **Solid Waste Management Reserve Fund** - Reserve fund financing is for Durham's share of a portion of the additional costs for expropriated lands ($6.07 million), the Owner's consultant ($1.9 million), legal fees for commissioning ($350,000), and air monitoring ($340,000), miscellaneous costs ($150,000), and final road surfacing estimate ($150,000).

4 **Liquidated Damages** - The application of liquidated damages due from Covanta to offset project costs, including by-pass waste, or to replace temporary draws from the Solid Waste Management reserve fund based upon determination of final project costs.

5 **Other Revenue** - Other Revenue includes proceeds to date from sale of lands to Ministry of Transportation and the pending sale to York of a 50% interest in the facility lands (estimated at $1.5 million).

6 **Rail Crossing** - Rail crossing cost estimates of $1.1 million are accrued for Project Cost purposes and $300,000 is financed from within the budget for HCA works. The balance of financing currently estimated at $800,000, including York's share, to complete the tunneling work under the CN Rail line, will be determined at the time of the tender award.

8.3 The budget status and forecast for operations the 2016 year is shown on the following table.

Table 4
DYEC Operating Budget Status and Forecast for 2016

Notes		Budget $ thousands	Projected Actual $ thousands
	Haulage to DYEC	2,763	2,469
1	Covanta operating fees	16,150	13,718
2	Other operating costs	1,350	1,414
	Property taxes	1,068	749
	York Recoveries	(3,969)	(3,394)
	DYEC operations	14,599	12,487
	Total DYEC expenses (Durham only)	17,362	14,956
3	Sale of By-product materials	573	473
4	Electrical power revenue	6,994	5,855
	Revenue (Durham only)	7,567	6,328
	Net DYEC expenses (Durham only)	**9,795**	**8,628**

Operating Budget Notes:

1. **Covanta operating fee** - The 50% operating fee was charged in January until the commencement of commercial operations on January 29, 2016.

2. **Other operating costs** - Includes $210,000 additional requirement for increased frequency of ambient air dioxins and furans monitoring, monthly soil testing and peer review of upcoming source tests, as recommended in this report.

3. **Sale of By-product materials** - Actual by-product revenues are expected to be lower than budget due to price volatility and no revenues prior to commencement of commercial operations and during outage periods.

4. **Electrical power revenue** - Power Purchase Agreement (PPA) rates were effective beginning Oct. 16, 2015, at 8.167 cents per Kwh in 2015, and 8.203 cents per Kwh in 2016.

Glossary

AD	Anaerobic Digestion
AMESA	Adsorption Method for Sampling of Dioxins and Furans
AMO	Association of Municipalities of Ontario
C&D	Construction and Demolition
CDA	Canadian Diabetes Association
CIP	Continuous Improvement Fund
CLA	*Construction Lien Act*
CO_2e	Carbon Dioxide-Equivalent
COW	Committee of the Whole
CPI	Consumer Price Index
DBO	Design Build Operate
DC	Development Charges
DCDSB	Durham Catholic District School Board
DDSB	Durham District School Board
DYEC	Durham York Energy Centre
ECA	Environmental Compliance Approval
EFW	Energy-from-Waste
EPA	Environmental Performance Adjustment
EPR	Extended Producer Responsibility
FCM	Federation of Canadian Municipalities
HST	Harmonized Sales Tax
ICI	Industrial, Commercial and Institutional
IESO	Independent Electricity System Operator
GHG	Greenhouse Gas

GMF	Green Municipal Fund
HCA	Host Community Agreement
KPRDSB	Kawartha Pine Ridge District School Board
kWh	Kilowatt-Hour
LCBO	Liquor Control Board of Ontario
MHSW	Municipal Hazardous and Special Waste
MOECC	Ministry of the Environment and Climate Change
MPAC	Municipal Property Assessment Corporation
MRF	Material Recovery Facility
MW	Megawatt
OWAP	Organic Waste Action Plan
P3	Public, Private and Public-Private
RMC	Raw Materials Company
RPRA	Resource Productivity and Recovery Authority
SLA	Service Level Adjustment
SSO	Source-Separated Organics
WDA	*Waste Diversion Act*
WDO	Waste Diversion Ontario
WEEE	Waste Electrical and Electronic Equipment
WMF	Waste Management Facility