Agenda – Council – July 19, 2017

Report – Standing Policy Committee on Water and Waste, Riverbank Management and the Environment – June 29, 2017

Item No. 1 2016 Comprehensive Integrated Waste Management Strategy (CIWMS) Annual Report

STANDING COMMITTEE RECOMMENDATION:

On July 5, 2017, the Executive Policy Committee concurred in the recommendation of the Standing Policy Committee on Water and Waste, Riverbank Management and the Environment and submitted the following to Council:

1. That the report be received as information.

Report – Standing Policy Committee on Water and Waste, Riverbank Management and the Environment – June 29, 2017

DECISION MAKING HISTORY:

EXECUTIVE POLICY COMMITTEE RECOMMENDATION:

On July 5, 2017, the Executive Policy Committee concurred in the recommendation of the Standing Policy Committee on Water and Waste, Riverbank Management and the Environment and submitted the matter to Council.

STANDING COMMITTEE RECOMMENDATION:

On June 29, 2017, the Standing Policy Committee on Water and Waste, Riverbank Management and the Environment concurred in the recommendation of the Winnipeg Public Service and submitted the matter to the Executive Policy Committee and Council.

ADMINISTRATIVE REPORT

Title: **2016 Comprehensive Integrated Waste Management Strategy (CIWMS) Annual Report**

Critical Path: **Standing Policy Committee on Water and Waste, Riverbank Management and the Environment – Executive Policy Committee – Council**

AUTHORIZATION

Author	Department Head	CFO	CAO
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EXECUTIVE SUMMARY

The Annual Report to Council summarizes the accomplishments and financial results for 2016, as well as the plan and objectives set for 2017.

2016 was the fourth full year of implementation of the Comprehensive Integrated Waste Management Strategy **(**CIWMS) since beginning in 2012. Program accomplishments in 2016 include: the waste diversion rate increasing 1.5 percentage points over 2015 to 32.9%; reduction in greenhouse gasses at the Brady Road Resource Management Facility (BRRMF) equivalent to the emissions of over 22,000 passenger cars; the opening of the 4R Winnipeg Depot at the BRRMF; and the completion of the Waste Characterization Study.

RECOMMENDATIONS

That this report be received as information.

REASON FOR THE REPORT

On October 19, 2011, Council approved the Comprehensive Integrated Waste Management Strategy (CIWMS). Recommendation No. 28 of the CIWMS requires: "That the Winnipeg Public Service publish an annual report on the status of the Master Plan."

IMPLICATIONS OF THE RECOMMENDATIONS

There are no implications associated with the recommendation of the report.

HISTORY / DISCUSSION

Council adopted the Comprehensive Integrated Waste Management Strategy (CIWMS) on October 19, 2011, with the overall strategy of the plan being to increase Winnipeg's diversion rate to 35% by 2016 and to greater than 50% by 2020 and thereafter. Implementation of the plan began in 2012.

1. Program Accomplishments – 2016

2016 was the fourth full year of the Near Term phase of CIWMS, which is the first five-year plan (2012 to 2017) of the strategy. 2016 Program Accomplishments are outlined below.

Diversion Rate Continues to Increase
With the continued implementation of CIWMS, Winnipeg's residential waste diversion rate continues to increase.

The residential waste diversion rate increase was driven primarily by the opening of the first 4R Winnipeg Depot at the BRRMF in February 2016 and incremental improvements to existing programs. There were over 75,000 vehicle visits to the Brady Road 4R Winnipeg Depot in 2016, resulting in the diversion of over 4,000 tonnes of material.

The waste diversion rate for 2016 was 32.9%, which is:

- an increase of 1.5 percentage points from the 2015 diversion rate of 31.4%, and
- an increase of 14.3 percentage points from the 2011 diversion rate of 18.6% (the year before the new CIWMS programs were implemented).

Greenhouse Gas Reduction
In its third full year of operation, the new landfill gas system at the Brady Road Resource Management Facility (BRRMF) captured and flared 104,349 tonnes of carbon dioxide equivalent, similar to the amount captured in 2015 (110,314 tonnes). The 2016 amount is equivalent to avoiding the carbon dioxide emissions of 22,061 passenger cars.

4R Winnipeg Depots
The first 4R Winnipeg Depot at the BRRMF opened in February 2016. In its first partial year of operation, the Brady Road 4R Winnipeg Depot diverted over 4,000 tonnes of material and counted over 75,000 vehicles through its gates.

Construction of the Pacific Avenue 4R Winnipeg Depot continued in 2016, with the depot opening in January 2017. Design for the third depot site on Panet Road is currently underway. Construction on this depot is expected to start in mid-2017, with its opening expected in early 2018. Development of agreements with various product stewards for the collection and handling of designated materials at these depots continued.

Leaf and Yard Waste Composting
The finished compost continues to meet the standards established by the Compost Quality Alliance and the Canadian Council of Ministers of the Environment. Finished compost was primarily used as top dressing on finished areas of the landfill, and was provided, on a pilot basis, to other City departments.

Operation of a Biosolids Composting Facility
In 2016, 1,900 tonnes of biosolids were composted, representing 4% of the 2016 tonnage of biosolids that the BRRMF receives from the City's three sewage treatment plants. This is approximately half of the amount of biosolids that were composted in 2015. This decrease was due to equipment breakdowns and the ongoing challenges of composting biosolids in extreme cold weather. The composted material is being used for final cover at the BRRMF.

Lime Mud Berm Construction
In mid-December 2014, work began to build a new berm along the boundary of the BRRMF. Final landscaping work should be completed by fall 2017 and will include native grasses and trees, to create an aesthetically pleasing boundary along Brady Road, the Perimeter Highway and Waverley Street.

The berm is being constructed of lime mud, a natural by-product of the sugar refining process from a former Manitoba sugar beet processing plant. This initiative benefits the landfill, neighbouring properties and the environment by:

- reusing hundreds of thousands of cubic metres of material that would otherwise be landfilled
- helping to buffer visibility of the landfill
- generating surplus clay material (excavated for the berm), that can now be used as landfill cover for existing and future landfill disposal cells.

Waste Characterization Study
The first waste characterization study since the adoption of CIWMS was completed in 2016. Waste characterization is a method used to determine the types of materials being discarded in a waste stream and in what proportion. Waste characterization information is used to support the development of additional waste diversion programs. The average participation rate in the residential recycling program has increased from 66% in 2009 to 79% in 2016.

The following table describes the composition of materials found in the residential garbage stream, according to the waste characterization study:

	Single Family	Multi-Family	Weighted Average
Garbage	19%	19%	19%
Recyclable Material	28%	39%	31%
Organic Waste	53%	42%	50%
Total	100%	100%	100%

2. Waste Diversion Results

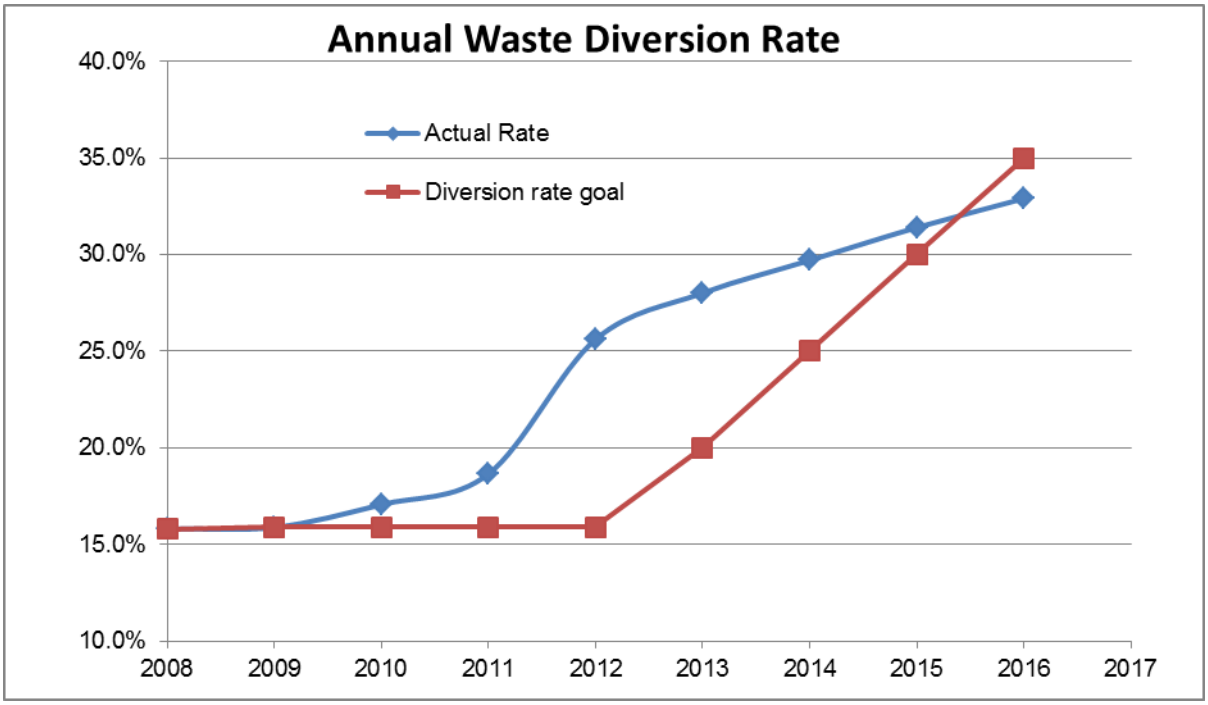
The waste diversion rate is calculated as a percentage of the total diverted residential tonnage versus total residential tonnage of material accepted at the BRRMF (landfilled and diverted material) and Material Recovery Facility (MRF). The methodology for calculating the waste diversion rate was updated in 2016, due the first opening of a 4R Winnipeg Depot, and to better align with waste sources based on the City of Winnipeg 2011 Community-wide Greenhouse Gas Inventory and Forecast.

The following table summarizes the waste diversion rate over the last six years, along with a description of the program status.

Year	Waste Diversion Rate	Program Status
2016	32.9%	4th full year of new program
2015	31.4%	3rd full year of new program
2014	29.7%	2nd full year of new program
2013	28.1%	1st full year of new program
2012	25.5%	Partial year of new program
2011	18.6%	Original program

Annual Waste Diversion Rate and Diversion Rate Goals

The chart below shows the waste diversion goals established by CIWMS, as well as the actual rate since 2008. The City has nearly reached its short-term goal of 35%, as set out in the strategy. With the commissioning of additional 4R Winnipeg Depots and continued refinements to waste diversion programs, the waste diversion rate should continue to grow incrementally.



Waste Generation
In addition to the waste diversion rate, waste generation is an important indicator of system performance. On a per capita basis from 2011 to 2016, garbage collected has decreased 22%, recycling has increased 17%, and composting has increased 221%.

Waste Generation per Capita (kg)

	2011	2016	Change
Population[1]	663,617	705,244	6%
Garbage			
Collected	316	247	-22%
Self-Haul	n/a[2]	26	n/a
Recycling			
Collected	65	75	15%
Self-Haul	4	6	50%
Composting			
Collected	n/a[3]	37	n/a
Self-Haul[4]	14	8	-43%

Residential Curbside Garbage Collection and Disposal
The amount of residential garbage collected and landfilled decreased by 2% (3,566 tonnes) in 2016. This may be attributed to continuous improvement of waste diversion programs.

The chart below shows a 17% decrease in garbage collected and landfilled in 2016 over 2011:

Year	Residential Garbage Tonnage	Program Status
2016	174,280	4th full year of new program
2015	177,845	3rd full year of new program
2014	176,011	2nd full year of new program
2013	173,897	1st full year of new program
2012	201,741	Partial year of new program
2011	209,741	Original program

Yard Waste Collection and Composting

Curbside Collection:
More than 26,000 tonnes of yard waste was collected curbside from the following properties:
- Single-family homes
- Other residential properties with seven units or less

[1] Statistics Canada 2011 and 2016 Censuses
[2] Not comparable due to differences in methodology
[3] Service not offered
[4] In 2011, self-haul consisted of the Leaf it With Us depots and Let's Chip In Christmas tree depots. The Leaf it With Us depots were closed in 2013 after the introduction of curbside leaf and yard waste collection. The 2016 figure reflects leaf and yard waste from the 4R Winnipeg Depots, and the Let's Chip In depots.

- Businesses, registered charities and places of worship signed up for cart collection service

Self-Haul:
About 8,000 tonnes of material were delivered by customers directly to the yard waste composting area at the BRRMF:

- 7,244 tonnes[5] from citizens/businesses
- 724 tonnes from the City's Retention Pond Weed Harvesting Program and from other public sources

Composting:
In 2016, over 34,000 tonnes of yard waste was composted on the nine-hectare compost pad. This represents a 48% increase over the full first year of curbside collection (in 2013) and a fivefold increase over 2011.

The finished compost continues to meet the standards established by the Compost Quality Alliance and the Canadian Council of Ministers of the Environment. In 2016, finished compost was primarily used as top dressing on finished areas of the landfill, and was provided to other City departments on a pilot basis.

Year	Yard Waste Tonnage	Program Status
2016	34,123	4th full year of new program
2015	33,474	3rd full year of new program
2014	29,754	2nd full year of new program
2013	23,223	1st full year of new program
2012	10,081	Partial year of new program
2011	6,598	Original program

Recycling Collection Program
There was a 1.2% decrease in 2016 over last year in the recycling material collected through the curbside, depot and public space collection programs. This still represents a 20% increase over 2011. The decrease in tonnage from 2015 may reflect changes occurring in the industry, including decreases in newsprint and the trend towards lighter packaging.

Year	Recycling Tonnage	Program Status
2016	55,010	4th full year of new program
2015	55,697	3rd full year of new program
2014	54,465	2nd full year of new program
2013	53,606	1st full year of new program
2012	48,087	Partial year of new program
2011	45,835	Original program

Abandoned Waste, Large Item and Extra Garbage Collection
Reports of Abandoned Waste decreased (-33%) and requests to 311 for Large Item Pickups decreased (-7%) in 2016 compared to 2015.

[5] Estimated

Since 2013, the number of residents using the Extra Garbage Pickup service has steadily decreased, which may be attributable to residents adapting to the 240-litre garbage cart system, where they choose to distribute any excess waste over a number of collections rather than arranging to have the excess collected on a single collection day.

Requests to 311	2016	2015	2014
Abandoned Waste reports	1,708[6]	2,559[6]	851
Large Item pickup[7]	12,636	13,561	13,339
Extra Garbage pickup	512	825	1,136

Curbside Garbage, Recycling and Yard Waste Collection Performance

Collection	Approximate No. of Locations Collected Weekly[8]	311 Reports of Missed Collection 2016	311 Reports of Missed Collection 2015	311 Reports of Missed Collection 2014
Garbage carts	197,800	13,200	13,668	13,341
Recycling carts	197,800	11,338	15,066	11,995
Yard waste (April to November)	98,900	5,183	9,048	3,773
Total		**29,721**	**37,782**	**29,109**

Note: The total number of reports of missed collection may not be a true indication of contractor performance and penalties. For example, upon investigation by either the City or the contractor, a number of complaints registered as missed collection show:

- there was a valid reason why collection was not done
- the call should have been recorded as a different type of service request

Landfill Gas Capture and Flaring System

The new landfill gas system, which became operational in 2013, captured and flared 104,349 tonnes of carbon dioxide equivalents in 2016. This is equivalent to avoiding the carbon dioxide emissions of 22,061 passenger cars (based on the US EPA Greenhouse Gas Equivalencies Calculator).

Landfill Gas Capture and Flaring Operation	2016	2015	2014
Tonnes of carbon dioxide equivalents from flare	104,349	110,314	109,470
Average cubic feet per minute	941.9	1015	900
Average methane content	46.0%	49.5%	49.0%

Public Engagement

The Community Liaison Committee for the BRRMF, established in 2014 as part of the requirements of the new Environmental Act Licence, had two meetings in 2016. Committee members provided advice on:

- a plan for landscaping finished areas of the landfill
- a plan for monitoring noise and odour

[6] Includes requests generated by Solid Waste Services staff
[7] Includes pickups of bulky waste and appliances with ozone depleting substances
[8] As of December 2016

- ways to reduce the impact of landfill activities (e.g., construction, operations) on the local environment

The Waste Diversion Advisory Committee also met twice in 2016. The role of the committee is "to provide advice and recommendations for the completion, implementation, and continual improvement of the Garbage and Recycling Master Plan". The Committee was chosen to ensure a variety of perspectives were represented, including a diversity of ages and gender, urban and suburban residents, homeowners and renters, families with and without children, and residents living in single-family and multi-family dwellings. In its second year, the committee continued to familiarize itself with solid waste operations and provided input into the development of the Organics Diversion Strategy and other diversion initiatives.

3. Financial Results

City Council's adoption of the CIWMS also included the introduction of the annual Waste Diversion Fee. Effective January 1, 2016, this fee was charged at an annual rate of $56 (2015 - $55) per dwelling unit (properties with seven or less dwellings as defined by the Solid Waste By-law). These monies are used to fund waste diversion programs. The total revenue collected in 2016 was $11.4 million, comparable to $10.5 million in 2015.

Operating Cost Highlights

Contract Costs (in Millions)	2016	2015	2014
Garbage Collection[9]	$7.7M	$7.5M	$7.9M
Recycling Cart Collection[10]	$4.9M	$5.1M	$5.4M
Recycling Processing	$7.8M	$7.6M	$8.7M[11]
Leaf and Yard Waste Collection	$3.0M	$2.9M	$2.7M
Leaf and Yard Waste Composting	$0.9M	$0.9M	$0.8M

Carts

In 2016, cart purchases were funded out of the annual operating budget. Total costs in the amount of $489,195 were incurred for the purchase of garbage and recycling carts for new housing developments and for the replacement of damaged carts.

On January 28, 2015, Council approved a recommendation to provide a replacement recycling cart or garbage cart at no cost to a property owner if it was determined that the cart has been damaged by a third party through no fault of the property owner. In 2016, 361 requests to 311 were made for the replacement of carts at no cost to property owners through this program, in comparison to 358 requests in 2015.

[9] Excludes multi-family properties that use garbage bins

[10] Includes multi-family properties that use recycling carts

[11] The recycling material processing facility, owned and operated by Emterra, was expanded in 2012-13 to accommodate the processing needs of the additional tonnage of recycling material collected. The expansion costs translated into a new, increased per tonne operating costs for the City. The agreement was finalized in the spring of 2015, and 2014 cost reflects the impact of catch-up payment from the terms of the agreement for the 2013 and 2014 fiscal years.

Waste Diversion Reserve Fund
A summary of financial results include (in millions):

Annual Waste Diversion Fee		$11.4
Waste Diversion Grants		$11.9
	Total Revenue	$23.3
Program costs		$18.8
Transfer to Waste Diversion Reserve		$ 4.5
	Total	$23.3

Waste diversion initiatives are funded through the waste diversion fee and third party grants. In 2016, waste diversion grants were received from third parties in the amount of $11.9 million. Total program costs for 2016, including amortization, debt, salaries and allocated departmental costs, were $18.8 million, resulting in a transfer to the Waste Diversion Reserve Fund of $4.5 million.

At December 31, 2016, the balance in the Waste Diversion Reserve was $6.6 million. This balance will be used towards funding future waste diversion initiatives, most notably the construction of the 4R Winnipeg Depots.

Capital Costs

4R Winnipeg Depots
The 4R Winnipeg Depot located at the BRRMF opened in February 2016 and was completed at a cost of $5.13 million. The Pacific Avenue 4R Winnipeg Depot opened in January 2017 and has an estimated final cost of $4.85 million. The Panet Road site is currently under construction and has an estimated cost is $4.88 million.

Organics and Waste Characterization Study
The development of the Organics Diversion Strategy and Waste Characterization Study started early 2015. The Waste Characterization Study was completed in 2016, while the Organics Diversion Strategy will be incorporated into the CIWMS review. The anticipated total cost of this project is $276,500.

Multi-Family Dwelling Waste Diversion Strategy
The development of a Multi-Family Dwelling (MFD) Waste Diversion Strategy started in June 2016 and is ongoing. The anticipated total cost of this project is $195,500.

Leachate Treatment Study
A study is currently underway to identify treatment options for leachate generated by the BRRMF and the three closed landfills with leachate collection systems (Summit, Kilcona and Saskatchewan Avenue Dump Site). The anticipated total cost of this project is $118,000.

BRRMF Site Improvements
Improvements are required at the site of the BRRMF under the site's Environment Act Licence. Phase 1 of the BRRMF landscaping plan was completed in 2016 at a cost of $75,600. This phase involved the planting of trees along the north face of BRRMF, to test of suitability of

different species in a landfill environment. Approximately $390,000 was spent to improve the surface water management of the site through drainage and ditch works.

Closed Landfills Disposition Study
The updated Closed Landfill Disposition Study was completed in 2016. The study provides the context for understanding the potential risks associated with Winnipeg's 33 closed landfill sites. These risks include methane gas, as well as impacts to ground and surface water. The study will assist with improvements to the existing environmental monitoring program for closed landfills, and identify infrastructure needs for the Closed Landfill Improvements Capital Program. The cost of this study was $151,000.

Landfill Gas
The landfill gas capture system will be expanded as disposal areas reach capacity and are closed. The design of the expanded system was completed in 2016. Expansion of the gas wells are planned for 2017 and 2018. The anticipated total cost of the project is approximately $4 million.

The City will continue to assess the feasibility of converting landfill gas to energy with its partners. A budget of $200,000 was approved in the 2016 Capital Budget for this project.

BRRMF – Master Infrastructure Plan Development and Cell Design and Construction
A study is underway to develop an infrastructure master plan for the BRRMF. This includes placement of future disposal cells, roadways, and leachate and landfill gas infrastructure. An updated lifespan estimate and clay balance of the site will also be developed. The contract also includes engineering design and construction services for the next three disposal cells over the next five years. The anticipated total cost of this project is $900,000.

4. 2017 Implementation Plan

4R Winnipeg Depots
The second 4R Winnipeg Depot on Pacific Avenue, between McPhillips and Weston Streets, opened in January 2017. Design work on the third depot, which will be located on Panet Road, will be completed in the first quarter of 2017, with construction beginning shortly after.

These depots will continue to:

- provide residents with an opportunity to drop off materials that could be resold, recycled, composted or reused, instead of landfilled
- keep more garbage out of the landfill, which means less harmful landfill gas
- help ensure that hazardous materials are disposed of safely

According to the CIWMS, the diversion of material through the 4R Winnipeg Depot Program should lead to about a 10% increase in overall waste diversion.

New Integrated Solid Waste Collection Contracts
In 2016, a Request for Proposals (RFP) was issued for the collection of residential garbage, recycling, yard waste and surplus waste for the period from October 1, 2017 to January 31, 2025. The contracts were awarded to Miller Waste Systems Inc. and GFL Environmental Inc. by City Council on October 26, 2016. Implementation plans and regular meetings with the contractors have been established to facilitate the transition to the new integrated waste collection contract.

CIWMS Review, Organics Diversion Strategy and Multi-Family Dwelling Diversion Strategy
The five-year review of the CIWMS has been mandated by Council. The review will assess CIWMS's goals and timelines, including whether they are appropriate and sustainable. The review will also address Council's April 2016 motion on organic waste and effectiveness of service delivery.

Biosolids Soil Manufacturing Pilot
A pilot project is underway to divert biosolids and other material received at the BRRMF to fabricate topsoil for use as final cover. This project aims to demonstrate the safe and effective use of biosolids in this manner, providing an additional long-term beneficial use option for biosolids.

Landfill Gas (LFG)
The design of the LFG well expansion was completed in 2016 and construction will take place in 2017 to 2018. The additional wells will be drilled and then tied into the existing LFG capture and flaring system. A Letter of Intent has been signed with Manitoba Hydro to jointly study and assessing the feasibility of beneficial use of landfill gas.

Communication Strategy
The City will continue to use a multi-pronged approach to communicate its recycling and garbage programs and services, as well as its waste reduction/diversion efforts. Examples of different communication activities include:

- Providing new dwellings with a reusable bag which contains an information package on new collection services, a current calendar with their new collection day and two sample paper yard waste bags
- Using summer students to educate residents through home visits during the summer months
- Participating in public events, such as Home Expressions – Home and Garden Show, Take Pride Winnipeg's Sustainability Day and Team Up to Clean Up
- Continued public education through social and traditional media (newspaper, radio ads, community newsletters)

History

In 2009, Winnipeggers landfilled in excess of 340,000 tonnes of residential garbage, and recycled and composted approximately 54,000 tonnes of residential material, for a diversion rate of about 15%, one of the lowest in Canada. At the same time, the Public Service was recommending changes to the garbage and recycling collection systems based on feedback from collectors, industry trends and other municipalities in North America.

As a result, in June 2010, Council directed the Public Service to create a waste diversion strategy, with consultation from the public, to increase the waste diversion rate, explore options for material collection and provide uniform service for the citizens of Winnipeg. Working with a consultant and through extensive public consultations, a made-for-Winnipeg plan was developed.

OurWinnipeg also identified the need to carry out a comprehensive waste management strategy, to integrate and optimize the service level and efficiency of all facets of the solid waste management system, while minimizing environmental impacts.

On October 19, 2011, Council approved the Comprehensive Integrated Waste Management Strategy (CIWMS).

FINANCIAL IMPACT

Financial Impact Statement **Date:** May 11, 2017

Project Name:

2016 Comprehensive Integrated Waste Management Strategy (CIWMS) Annual Report

COMMENTS:

There is no financial impact as this report is for information only.

"Original signed by L. Szkwarek, CPA, CGA"
Lucy Szkwarek, CPA, CGA
Acting Manager of Finance and Administration

CONSULTATION

In preparing this report there was consultation with:

n/a

OURWINNIPEG POLICY ALIGNMENT

This report is in accordance with the OurWinnipeg policies through:

Section 02-2 Environment – “set long range goals for solid waste diversion”

SUBMITTED BY

Department: Water and Waste
Division: Solid Waste Services
Prepared by: J. Lee/R. Park/D. Strandberg/L. Fisher
Date: May 25, 2017
File No.: G-101