



RECYCLEBC™

Recycle BC

Packaging and Paper Product Collection Costs

2019 Cost Study

July, 2020

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SECTION 1: Executive Summary

This 2020 cost study is the third cost study undertaken by Recycle BC. Previous cost studies were undertaken by Recycle BC in 2013 and 2018. The purpose of these cost studies is to canvass collection service providers (collectors) who operate in BC under Recycle BC's Packaging and Paper Product (PPP) Stewardship Plan. Collectors are canvassed for cost and related information which is then used by Recycle BC to establish market clearing prices for collectors.

Collection, Promotion and Education (P&E), and Service Administration costs were studied for three collection types: Curbside, Multi-Family and Depot. Three types of collectors participated in this cost study: local governments, private collectors and Recycle BC's direct service.

The data collection request for the 2020 cost study was sent to 46 local governments, 19 private collectors plus 5 Recycle BC's direct service with a total of 96 potential collection programs.

With data from 69 collection programs received, the total number of responses for the 2020 cost study was much higher than the previous studies.

The following table provides a summary of key numbers for each cost category with a comparison to the 2018 cost study results.

Cost Category	# of Collection Programs	Weighted Average	2-Year Change %
Collection Cost			
Curbside Collection (Cost/Household (HH))	23	\$46	7%
Multi-Family Collection (Cost/HH)	8	\$29	26%
Depot Collection (Cost/Tonne)	38	\$427	42%
Total Collection Cost	69		
P&E (Cost/HH) ¹	66	\$0.95	-37%
Service Administration (Cost/HH)	66	\$3.79	137%

¹ All participants across collection types were requested to also provide Promotion and Education and Service Administration costs alongside their collection costs; however only 66 of 69 participating collection programs provided these categories.

SECTION 2: Cost Study Purpose

The Packaging and Paper Product (PPP) Stewardship Plan² supports PPP collection services by providing opportunity for those involved in the collection of PPP (collectors) to provide services directly to their residents and customers³ through a Services Agreement with Recycle BC.

In 2013, research into PPP collection costs was first completed to assist in setting market-clearing prices⁴. Setting appropriate market-clearing prices is important to drive effectiveness in the collection of PPP, reward efficient operators and encourage efficiency among other operators.

The purpose of this 2020 cost study is to understand 2019 collection costs and compare them to those in 2017 identified in the 2018 cost study.

SECTION 3: Study Methodology

3.1 Data Collection Methodology

In October 2019, local governments and private collectors received a letter from Recycle BC requesting their participation. In February 2020, Recycle BC sent a letter to participants to introduce them to the study and the third-party professional service firm engaged to facilitate this cost study. Participants then received the Cost Study Report template along with guidance notes on how to complete the data fields. A collated document of Frequently Asked Questions was also shared with participants during the data collection process.

Virtual and face-to-face meetings were conducted in February and March 2020. The purpose of these initial meetings was to review the Cost Study Report template and answer data collection questions. Subsequent to data submission, additional virtual meetings were conducted, or emails exchanged, to clarify incomplete data sets and anomalies.

For direct service programs, Recycle BC directly provided 2019 collection cost data to the independent third-party financial accounting firm.

A summary of the cost results from the data collection process is included in Section 5: 2019 Collection Cost Results.

² Available via the Recycle BC website at https://recyclebc.ca/stewards/regulation_and_stewardship_plan/.

³ The financial incentive is offered for collection services. Collection services are distinct from post-collection services which include receiving PPP from collection vehicles, picking up PPP from depots, consolidation and transfer where required, and processing and marketing of PPP.

⁴ A market-clearing price is a payment available to collection service providers (subject to executing an agreement to provide the collection service, complying with the collector qualification standard on a continuous basis, and reporting specified data on a defined schedule).

3.2 Study Size

In the 2018 cost study, collection cost data was requested from 23 local governments and data was received from 12.

In the 2020 cost study, collection cost data was requested⁵ from:

- 46 local governments representing 69 collection programs⁶;
- 19 private collectors representing 22 collection programs; and
- 5 direct service programs representing 5 collection programs.

Of the collection cost data requested, submissions were received from:

- 35 local governments representing 50 collection programs;
- 12 private collectors representing 14 collection programs; and
- 5 direct service programs representing 5 collection programs.

In total, out of 96 collection programs' data requested of local governments, private collectors, and direct service programs, 69 collection programs were received. The difference in total collection programs' data requested and received was due to collectors not responding to the request and five participant declines.

The following table summarizes the collection programs by cost study participation.

Cost Category	2018 Participation	2020 Participation
Collection Cost		
Curbside Collection	11	23
Multi-Family Collection	5	8
Depot Collection	8	38
Total Collection Cost	24	69
Promotion and Education ⁷	17	66
Service Administration	17	66

⁵ Recycle BC provided a list of 94 collection programs to the third-party financial firm for participation in the cost study. 2 additional programs were voluntarily provided by participants.

⁶ Some participants were requested to provide data for more than one collection area or more than one collection type.

⁷ All participants across collection types were requested to also provide Promotion and Education and Service Administration costs alongside their collection costs; however only 66 collection programs provided these categories.

3.3 Cost Category Definitions

Collection, Promotion and Education (P&E) and Service Administration costs were studied for three collection types: Curbside, Multi-Family and Depot.

Collection Costs

Collection costs include operating and capital amortization costs. Operating costs were actual 2019 expenditures. Participants were requested to distinguish collection from post-collection costs, based on the activities listed on the Cost Study Report template and the guidance notes, and to only provide collection costs in their Cost Study Report.

For capital amortization costs, participants were requested to identify all capital assets used to provide PPP collection service within the amortization periods.

Promotion and Education (P&E) Cost

P&E includes labour and supply costs incurred to educate and promote the PPP Program to residents.

Service Administration Cost

Service Administration refers to any overhead costs incurred to manage the Recycle BC PPP program that are not covered in Collection nor Promotion & Education costs.

3.4 Cost Allocations Methodology

Participants were requested to provide their cost specific to the Recycle BC PPP Collection Program. For those unable to segregate their PPP costs from their gross costs, the third-party professional service firm engaged to facilitate this cost study allocated based on the following methodologies:

Cost Category	Cost Items	Cost Allocation Approach
Curbside and Multi-Family Collection Costs	<ul style="list-style-type: none"> • PPP containers amortization • PPP collection carts amortization 	<ul style="list-style-type: none"> • 100% allocated to PPP
	<ul style="list-style-type: none"> • Vehicle amortization • Vehicle lease • Vehicle repairs and maintenance • Fuel • Labour (operators, foreman and supervisor) 	<ul style="list-style-type: none"> • PPP% of total truck hours or kilometers
	<ul style="list-style-type: none"> • Training • Fleet management • Materials and supplies • Vehicle communications, license and insurance • Miscellaneous equipment and services • Others 	<ul style="list-style-type: none"> • PPP% of total number of collections (calculated based on collection frequency of each waste stream)
Depot Collection Costs	<ul style="list-style-type: none"> • Equipment and renovation amortization • Minor expansions & retrofit amortization • Containers amortization • Rolling stock amortization 	<ul style="list-style-type: none"> • PPP% of total tonnage collected, or • PPP% of total square footage of depot site

	<ul style="list-style-type: none"> • Labour (operators/supervisors)⁸ • Training • Equipment repairs and maintenance • Equipment rental • Equipment fuel • Miscellaneous supplies • Facilities costs (building repairs and maintenance, utilities) 	
P&E and Service Administration Costs	<ul style="list-style-type: none"> • Salary of shared staff • Operating costs (material, rent) 	<ul style="list-style-type: none"> • PPP% of total tonnage collected
	<ul style="list-style-type: none"> • Customer service 	<ul style="list-style-type: none"> • PPP% of total call centre inquiries
	<ul style="list-style-type: none"> • Website maintenance 	<ul style="list-style-type: none"> • PPP% of total website traffic

3.5 Capital Costs Amortization and Cost of Capital

Capital assets were amortized based on the following amortization periods. Any capital assets purchased before the amortization period were considered fully amortized and therefore excluded from collection costs. Amortization periods were given by Recycle BC and consistent with prior year studies.

Capital Assets	Collection Type	Amortization Period (Year)
Purchase of Collection Vehicles	Curbside, Multi-Family and Depot	7
Purchase of Carts	Curbside, Multi-Family and Depot	10
Initial Purchase and Replacements of Collection Containers/Bags Provided to Residents	Curbside, Multi-Family and Depot	10
Purchase of Initial Depot Equipment/Major Renovations	Depot	10
Purchase of Minor Expansions/Retrofits	Depot	5
Purchase of Rolling Stock	Depot	3
Construction of Depot Building	Depot	20
Purchase of Other Uncategorized Capital Assets	Curbside, Multi-Family and Depot	Defined by participant

Annual amortization expense was calculated by dividing original purchase price by amortization period.

Cost of capital calculation:

⁸ Most collection programs had shared staff for operating the PPP program and other waste types. The recommended allocation approach was to segregate PPP costs based on tonnage. However, most did not have tonnage information available. PPP allocation for labour costs were primarily estimated by participants based on average time spent in a weekly or monthly basis on PPP program versus other waste collection programs.

1. Net book value (NBV) as of January 1, 2019 was calculated by subtracting accumulated amortization up to end of 2018 from original purchase price.
2. Cost of capital was derived by applying historical interest rates⁹ of the purchase year to NBV.

SECTION 4: Data Integrity and Accuracy

4.1 Data Integrity

Participants were requested to provide actual costs incurred in 2019.

This report relies on information provided by the cost study participants, and the third-party professional service firm has not performed an independent review of this information. It does not constitute an audit conducted in accordance with generally accepted auditing standards, an examination or compilation of, or the performance of agreed upon procedures with respect to prospective financial information, an examination of or any other form of assurance with respect to internal controls, or other attestation or review services in accordance with standards or rules established by the CICA or other regulatory body.

It should be noted that enquiries were made with participants to confirm the numbers if they appeared to be outliers based on other collectors in the same geographical region or of similar size.

4.2 Data Accuracy

Participants were requested to either provide PPP-specific costs or provide the gross costs and request the third-party professional service firm to apply the cost allocation approach in Section 3.4: Cost Allocations Methodology.

Of the total 69 collection programs' data received:

- 40 were provided entirely by participants and determined to be reflective of the time and effort associated with operating the PPP collection programs;
- 20 collection programs required the third-party professional service firm to allocate approximate costs in accordance with Section 3.4: Cost Allocation Methodology; and
- 9 collection programs were collected during the meetings as best estimates provided by participants.

Data Collected in Meetings

Nine depot collection programs' costs collected during virtual meetings due to language barriers faced by participants. The third-party professional service firm collected the key data fields required to understand 2019 total costs and applied the cost allocation approach in Section 3.4: Cost Allocations Methodology. Those collection programs were compared to those in the same region and/or of the similar size to confirm reasonableness.

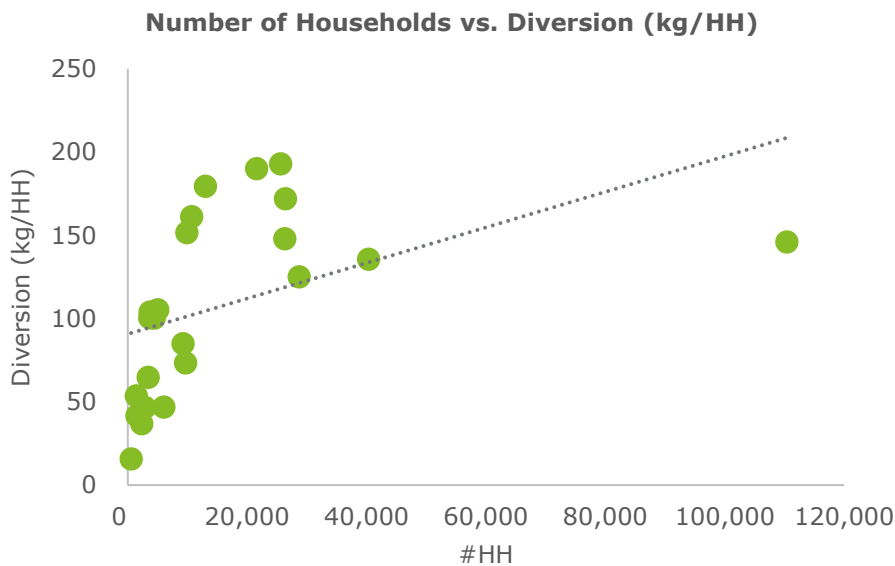
⁹ Source for historical interest rates: https://ycharts.com/indicators/canada_prime_rate_monthly .

SECTION 5: 2019 Collection Cost Results

5.1 Curbside Collection

Out of 30 curbside collection programs requested, 23 collection programs' costs were received and analyzed in the 2020 cost study.

Diversion¹⁰ in 2019 ranged from 16 kg/HH to 193 kg/HH¹¹. Diversion in 2017 ranged from 42 kg/HH to 200 kg/HH. Diversion in 2012 was from 48 Kg/HH to 270 Kg/HH.



Cost/HH in 2019 ranged from \$21 to \$80 (cost/HH in 2017 ranged from \$27 to \$69). Two outliers were identified with costs greater than \$100/HH due to individual circumstances and not used as representative sample costs in the Cost/HH below.

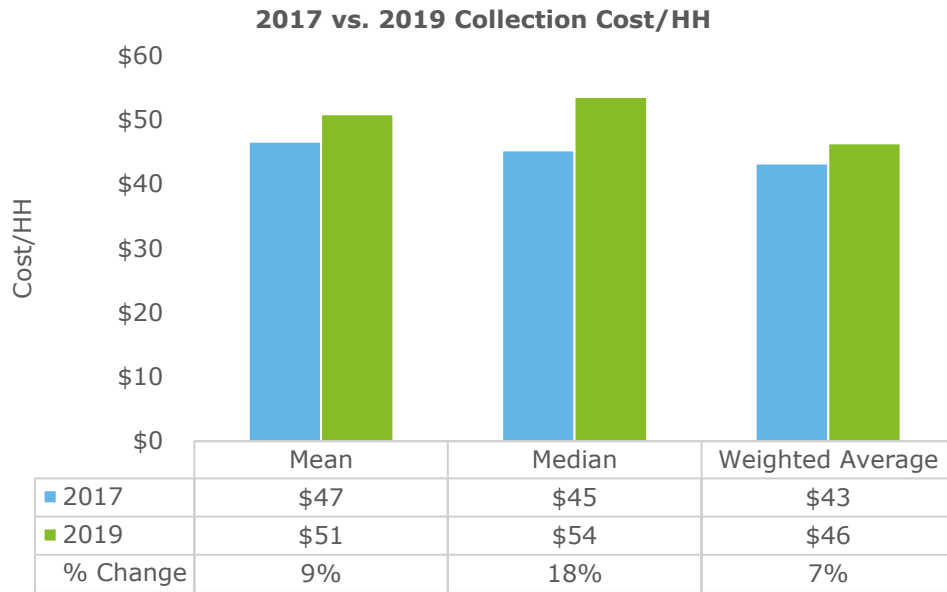
Cost/HH:

- 2019 Mean¹²: \$51
- 2019 Median: \$54
- 2019 Weighted Average by HH: \$46

¹⁰ Diversion is calculated as tonnage collected divided by number of households.

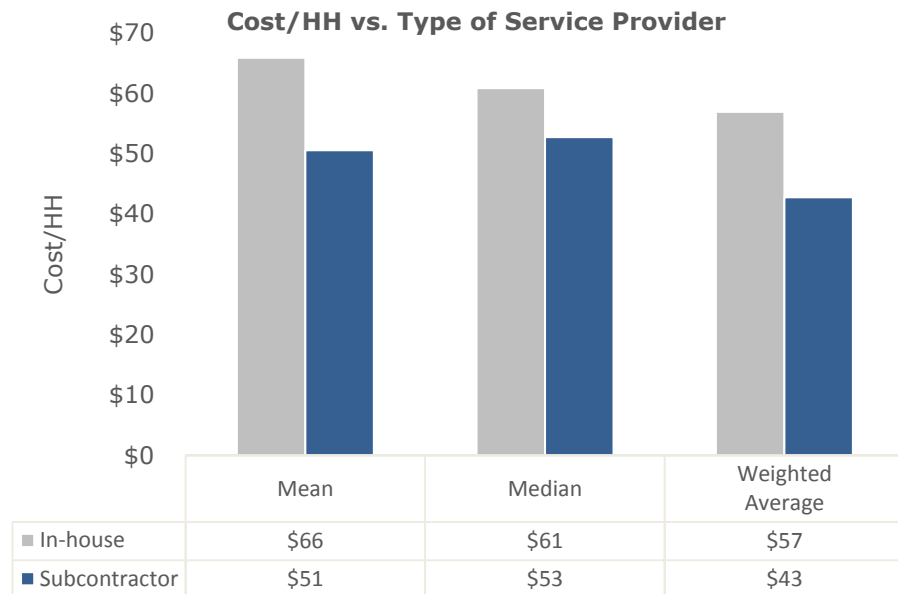
¹¹ The variance in the lower limit of the diversion range between 2017 and 2019 is due to the difference in the lowest number of households. In 2017, the lowest number of households was 5,435 whereas 2019 was 570.

¹² Mean: the average of the numbers
Median: the middle number in a list of sorted numbers
Weighted Average: the mean in which each item being averaged is multiplied by a number (weight) based on the item's relative importance (in this case, number of households).

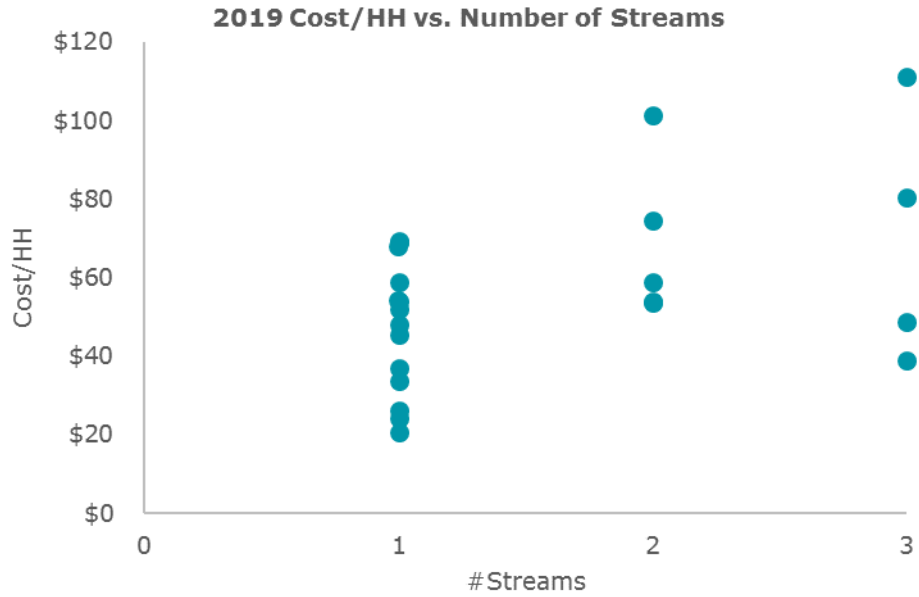


Out of 23 collection programs' costs received, five participated in both 2018 and 2020 cost studies. Considering just these participants, the two-year change in cost/HH ranged from a decrease of 1% to an increase of 18% with a weighted average by HH of 5%.

For curbside collection, 8 local governments delivered PPP collection service by providing the service in-house and 14 procured third-party waste management services.



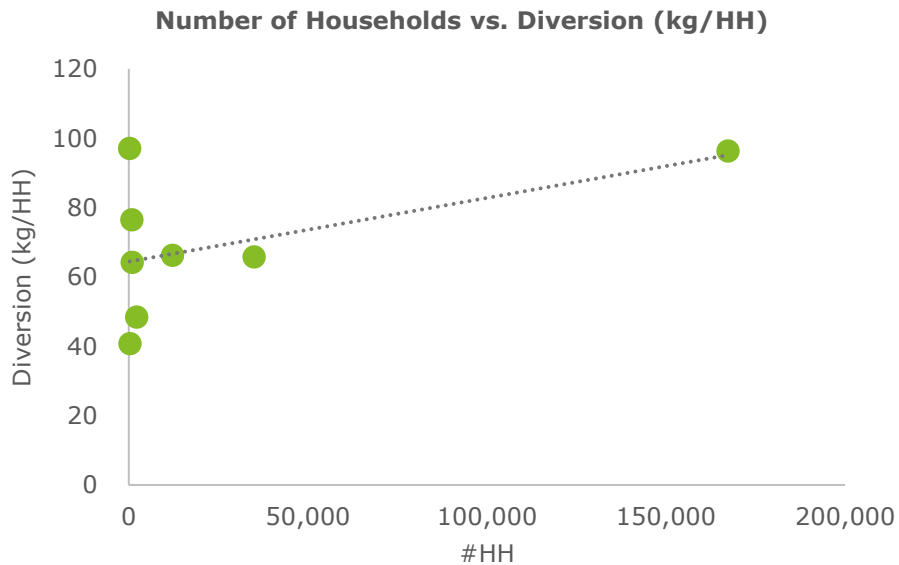
The weighted average cost/HH for one, two and three streams was \$42, \$60 and \$59 respectively.



5.2 Multi-Family Collection

Out of 13 multi-family collection programs requested, 8 collection programs' costs were received and analyzed in the 2020 cost study. Given the dataset is small, Multi-Family cost data should be reviewed with discretion.

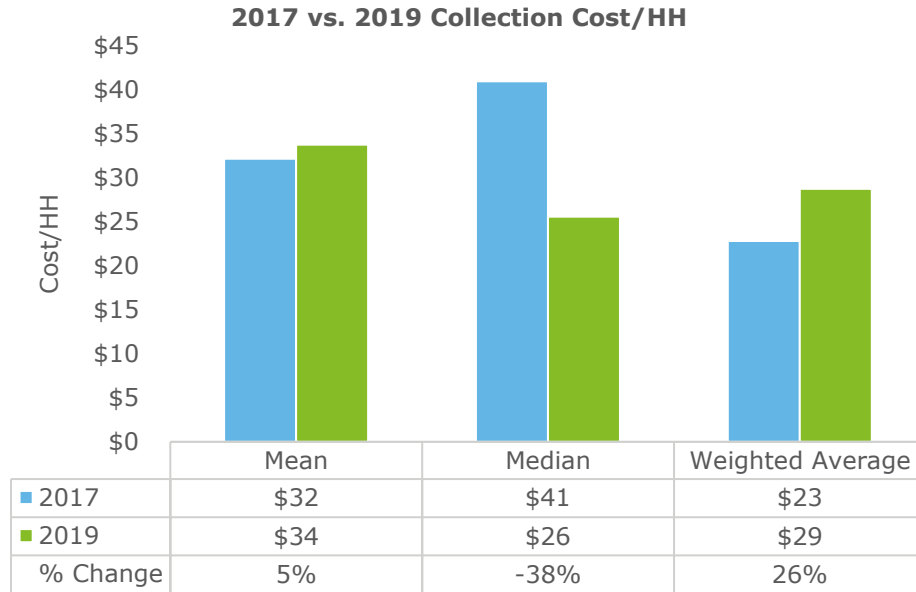
Diversion in 2019 ranged from 41 kg/HH to 97 kg/HH. Diversion in 2017 ranged from 67 kg/HH to 91 kg/HH. Diversion in 2012 was from 73 Kg/HH to 136 Kg/HH.



Cost/HH in 2019 ranged from \$14 to \$80 (cost/HH in 2017 ranged from \$14 to \$43). Two outliers were identified with costs greater than \$115/HH due to individual circumstances and not used as representative sample costs in the Cost/HH below.

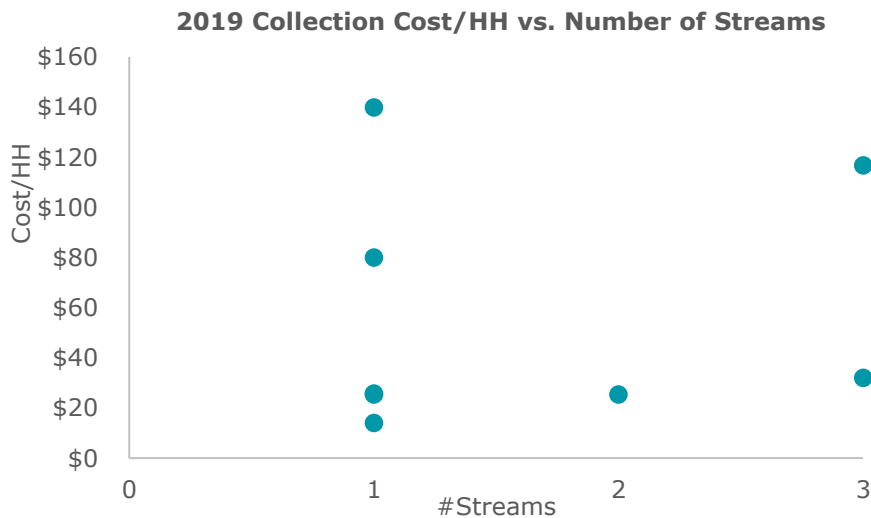
Cost/HH:

- 2019 Mean: \$34
- 2019 Median: \$26
- 2019 Weighted Average by HH: \$29



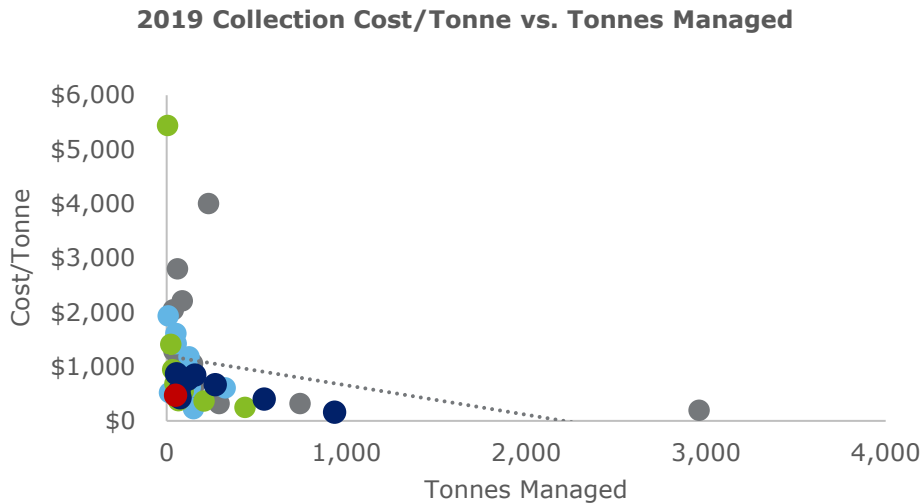
Out of eight collection programs' costs received, three participated in both 2018 and 2020 cost studies. Considering just these participants, the two-year change in cost/HH ranged from a decrease of 38% to an increase of 47%.

The weighted average cost/HH for one, two and three streams was \$18, \$25 and \$32 respectively.



5.3 Depot Collection

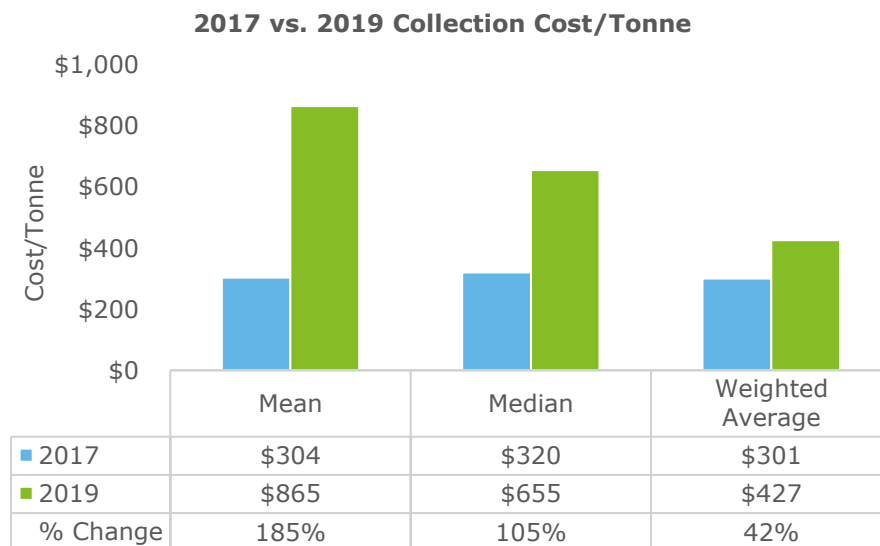
Out of 53 depot collection programs requested, 38 collection programs' costs were received and analyzed in the 2020 cost study. Depot costs were analyzed on a per tonne basis rather than on a per household (HH) basis.



Cost/Tonne in 2019 ranged from \$161 to \$2,803 (Cost/Tonne in 2017 ranged from \$148 to \$420). Two outliers were identified with costs greater than \$4,000 per tonne due to individual circumstances and not used as representative sample costs in the Cost/Tonne below.

Cost/Tonne:

- 2019 Mean: \$865
- 2019 Median: \$655
- 2019 Weighted Average by Tonne: \$427



Out of 38 collection programs' costs received, 10 programs (across 3 collectors) participated in both 2018 and 2020 cost studies. Considering just these participants, the two-year change in cost/tonne ranged from a decrease of 4% to an increase of 220%.

The 2020 cost study included two types of depot collectors: Local Government and Private Collectors whereas 2018 cost study only included Local Government. This study included 25 local government collection programs and 13 private collectors. The weighted average cost/tonne for Local Government is significantly lower than Private Company at \$452 and \$949, respectively.

5.4 Promotion and Education (P&E)

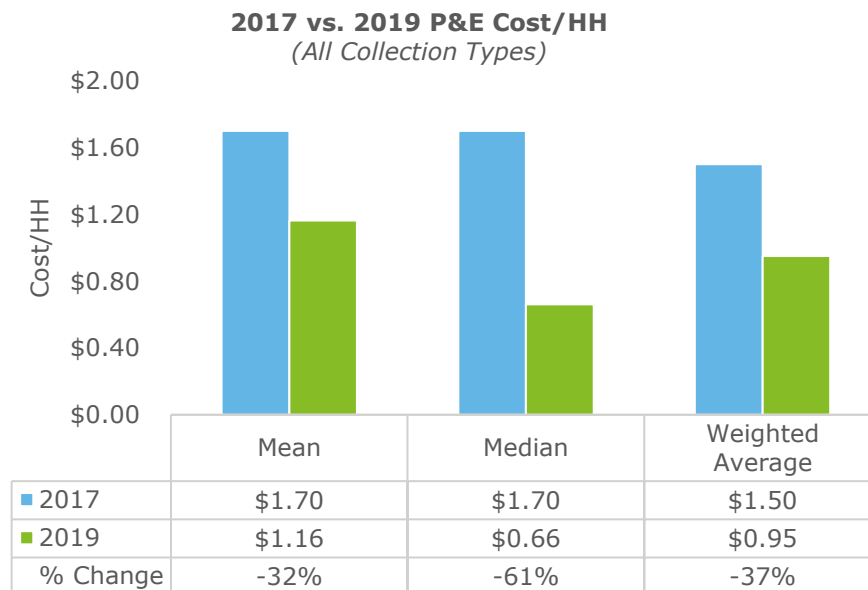
Out of 96 Promotion & Education collection programs' costs requested, 66 were received and analyzed in the 2020 cost study.

Only 22 out of 35 depots had the number of households available and hence were included in the analysis below.

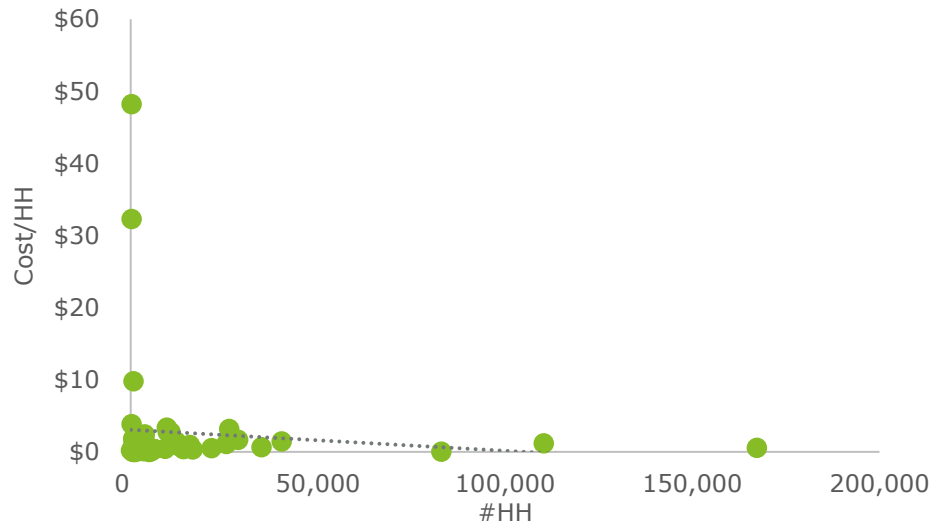
Cost/HH in 2019 ranged from \$0 to \$10 (cost/HH in 2017 ranged from \$0.02 to \$7). Two outliers were identified with costs greater than \$30/HH due to individual circumstances and not used as representative sample costs in the Cost/HH below.

Cost/HH:

- 2019 Mean: \$1.16
- 2019 Median: \$0.66
- 2019 Weighted Average by HH: \$0.95



2019 P&E Cost/HH vs. Number of Households
(All Collection Types)



5.5 Service Administration

Out of 96 Service Administration collection programs' costs requested, 66 were received and analyzed in the 2020 cost study.

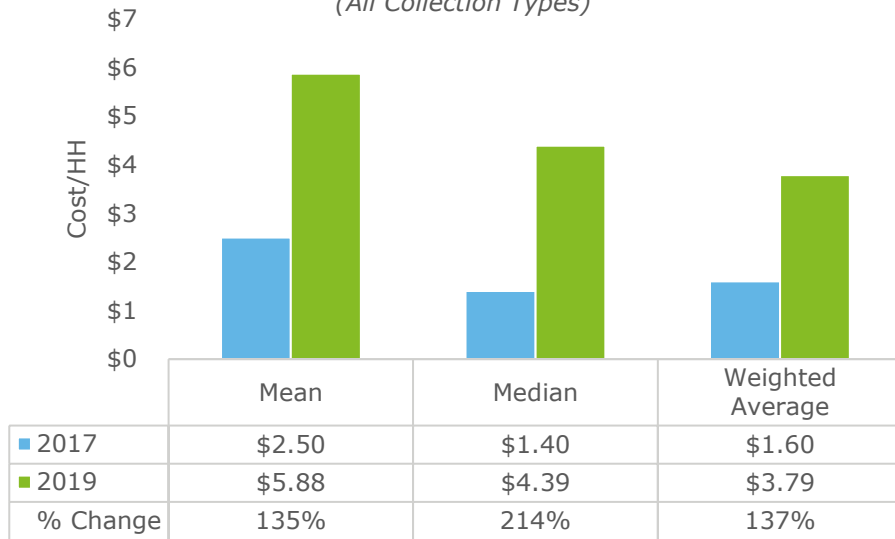
Only 22 out of 35 depots had the number of households available and hence were included in the analysis below.

Cost/HH in 2019 ranged from \$0.48 to \$27 (cost/HH in 2017 ranged from \$0.18 to \$8). Two outliers were identified, one reporting \$0 and one with costs greater than \$90/HH due to individual circumstances and not used as representative sample costs in the Cost/HH below.

Cost/HH:

- 2019 Mean: \$5.88
- 2019 Median: \$4.39
- 2019 Weighted Average by HH: \$3.79

2017 vs. 2019 Service Admin Cost/HH
(All Collection Types)



2019 Service Admin Cost/HH vs. Number of Households
(All Collection Types)

