

Appendix IX

Cost Allocation Principles

Collection and Processing Activity Based Costing Principles

Starting with the Municipal Recycling Cost Allocation Task Group collection and processing principles established in 1997 by a Committee of municipal and industry representatives, the Activity Based Costing Subcommittee of the Materials and Packaging Advisory Committee (MPAC) developed a series of collection and processing costing principles to be used to determine the cost for the management of each material within the blue box program. Wherever possible, the principles are based on identifying and then determining costs relative to specific activities undertaken in the collection and processing of recyclables.

These principles ensure that there is minimal allocation of costs on an arbitrary basis, i.e., costs being assigned that are not related to how costs are actually incurred relative to activities undertaken in the program. The principles cover all aspects of the programs including capital, operating and administration, under the assumption of full cost accounting. In total there are 11 collection cost principles and 48 processing cost principles. The principles are not meant to be taken in isolation, rather applied together.

The output from the application of these principles applied across a range of programs in the province is estimates of the actual gross cost to handle each material in the program.

Cost Allocation Assumptions – Collection

Collection (C) Assumption	Cost Driver(s)
C.1: The total collection cost should be allocated to each collection activity based upon the relative time spent on each activity.	1 st – time by individual material
C.2: The time (and associated capital, labour and operating cost) attributed to loading segregated recyclables (or streams of recyclables) into individual compartments should be allocated to those segregated materials.	1 st – time by individual material
C.3: The time (and associated capital, labour and operating cost) attributed to all non-sorting functions of collection, including morning inspection; driving to and from the route; entering and exiting the cab; picking up and setting down blue boxes; inspecting/quality control at the curb; emptying the hopper; talking to residents; coffee and lunch breaks; driving back to the depot at the end of the day should be apportioned to materials on the same basis as applied in C.2, where costs for curbside activities can be apportioned to individual materials.	1 st – time by individual material
C.4: Where C.2 cannot be applied to all materials, but rather where only limited splitting of sorting/loading times can be determined, the capital and labour costs associated with all curbside functions (as outlined in C.2 and C.3) should first be allocated on the time identified for each compartment (if possible) and then by the volume of the material within each compartment.	1 st – time by stream of materials 2 nd – volume within the stream
C.5: The cost of unloading individual materials should be allocated first on the basis of the time to unload each compartment and then, if necessary, based on the relative volumes of recyclables within that compartment.	1 st – time by individual compartment 2 nd – volume
C.6: The fuel costs should first be allocated on the time identified for each compartment and then, 10% of total fuel cost should be allocated to recyclables collected based on relative weights and 90% by onboard volume.	1 st – time by individual compartment 2 nd – 10% by weight; 90% by volume
C.7: The maintenance costs should first be allocated on the time identified for each compartment and then, 10% of total fuel maintenance should be allocated to recyclables collected based on relative weights and 90% by onboard volume.	1 st – time by individual compartment 2 nd – 10% by weight; 90% by volume
C.8: Administration costs directly attributable to specific materials should be allocated to those materials based on the time spent administering those materials. Administration costs that cannot be attributed to a specific material should be allocated equally across all materials.	1 st – individual materials 2 nd – equally

Collection (C) Assumption	Cost Driver(s)
C.9: General operating costs should be assigned to individual material as an additive cost based on the percentage cost allocations in total determined through the application of principles C.1 to C.8. This approach will not make any material change to the total percentage allocation of costs to individual materials.	1 st – additive cost based on allocations of all costs for C.1 to C.8
C.10: Promotion and education costs directly attributable to specific materials should be allocated to those materials based on the time spent administering those materials, with remaining costs allocated equally to all materials.	1 st – individual materials 2 nd – equally
C.11: Collection containers costs should be allocated to all materials based on the onboard volume of materials.	1 st – onboard volume

Cost Allocation Assumptions – Processing

Processing (P) Assumption	Cost Driver(s)
P.1: Floor space (m ²) is the driver that can best be used to allocate the MRF building cost to each of the five functional areas (receiving, processing, storage and shipping, general/transportation aisles, administration).	1 st – floor space
P.2: The cost of the receiving area shall be allocated to individual materials based on the relative tipping floor space (m ²) taken up and dedicated to each material in a single or commingled stream and then by volume.	1 st – floor space 2 nd – volume
P.3: The cost of storage and shipping space shall be allocated to individual materials based on the relative floor space (m ²) taken up and dedicated to each material shipped.	1 st – floor space
P.4: Where different pieces of equipment overlap each other in vertical space, the cost of the processing floor space shall be allocated by first dividing the floor space by the number of layers of equipment and then, where there are multiple materials processed in that layer, by the relative volumes of material on each layer.	1 st – floor space divided by the # of layers of equipment 2 nd – volumes
P.5: The cost of the processing floor space that can be attributed to a single material shall be allocated to that single material.	1 st – material specific floor space
P.6: The cost of the processing floor space under any equipment, where equipment is shared by more than one stream of materials, shall first be allocated on the basis of the time spent processing each stream. This principle applies to any function within the facility where a sharing of resources, on a time basis, is undertaken. Where there are multiple materials in the stream, further allocation shall be done on the basis of volume within the stream.	1 st – time 2 nd – volume
P.7: The cost of the processing floor space under the presort conveying system(s) shall be allocated on the basis of the volume processed of each material (assuming commingling of materials).	1 st – volume
P.8: The cost of the processing floor space under excess (defined as conveyors over bunkers that are not used in the sorting process) conveying equipment shall not fall to the last material, but shall be shared on the basis of the space taken up on the tipping floor (m ²) by each material utilizing the entire conveying system.	1 st – volume
P.9: The cost of the processing floor space in general/transportation aisles shall be allocated first on the basis of the time each material utilizes the space and then, where shared time is seen (e.g., moving mixed paper), on the basis of the relative volumes of each material within the stream.	1 st – time 2 nd – volume
P.10: The cost of administration floor space (m ²) shall be allocated first to those materials which cause the cost directly and then, the balance shall be allocated equally to all materials.	1 st – material specific 2 nd – equally to all materials

Processing (P) Assumption	Cost Driver(s)
P.11: The annualized capital cost of a feed conveyor used to transport commingled materials shall first be allocated by the relative time the conveyor is used for each stream. Then for each stream of mixed materials, the cost shall be allocated based on the relative volume of each recyclable material in the commingled stream	1 st – time 2 nd – volume
P.12: Similar allocation to that used in P.5. The annualized amortized capital cost of the conveyor belt is equated to the length of the bunker in which the material is held and that section is apportioned to the individual materials.	1 st – length
P.13: Similar allocation to that used in P.8. For bunkers not in use, the annualized capital cost for the equivalent length of conveyor shall be assigned equally to all materials on the belt on a volume basis.	1 st – length 2 nd – volume
P.14: The negatively sorted material shall be assigned the annualized capital cost for the length of conveyor past the last filled bunker. If more than one material is within the negative sort, the apportionment shall then be by volume. If residue is the material removed and placed into the bunker immediately prior to the negative sort (i.e., into the last filled bunker), that cost should be assigned to the negatively sorted material.	1 st – length 2 nd – volume
P.15: The annualized capital cost for stationary equipment that in place to the primary benefit of one material (e.g., ferrous magnet, eddy current separator) shall be assigned in whole to that material.	1 st – primary benefit material
P.16: The annualized capital cost for stationary equipment that is in place to the primary benefit of many materials (e.g., flats-rounds separator; air classifier) shall be assigned to each material benefiting from that equipment on the basis of the volume of each material processed by that equipment.	1 st – volume
P.17: The amortized capital cost of a baler shall be allocated based on the relative times required to bale each material.	1 st – time
P.18: The amortized capital cost of rolling stock shall first be allocated based on the time the equipment is used to handle individual materials. Allocation within a material stream should then be based on the volume of individual recyclables handled within each stream.	1 st – time 2 nd – volume
P.19: Similar allocation to that used in P.12. The annualized amortized capital cost of the structural platforms is equated to the area of the bunker in which the material is held and that platform area shall be apportioned to the individual materials across the time the line is used for that stream of materials.	1 st – time 2 nd – individual material bunker footprint
P.20: The annualized capital cost of the structural steel and platforms in use for the movement of commingled materials shall first be allocated by the relative time the steel structure and platforms are used for each stream. Then for each stream of mixed materials, the cost shall be allocated based on the relative volume of each recyclable material in the commingled stream	1 st – time 2 nd – volume

Processing (P) Assumption	Cost Driver(s)
<p>P.21: The amortized capital cost of a weighscale (and associated house, computer equipment, etc.) shall be apportioned based on the number of loads across the scale for specific materials. The cost apportioned to inbound trips shall be allocated based on the annual onboard density based volumes of materials. The cost apportioned to outgoing trips shall be allocated to individual materials based on the number of annual shipping loads for those materials. Where there are split loads, the load shall be apportioned by the relative percentage of the load for each material.</p>	<p>1st – number of loads 2nd – onboard volume of inbound and outbound vehicles</p>
<p>P.22: The cost of the annualized land value shall be allocated to individual materials based on the relative land space (m²) taken up and dedicated to each material.</p>	<p>1st – land space</p>
<p>P.23: The annual amortized capital cost of the paved or paved-equivalent areas of the MRF property shall be apportioned based on the number of loads inbound and outbound for each specific material, using volume for split loads where necessary.</p>	<p>1st – number of loads 2nd – volume</p>
<p>P.24: The annual amortized capital cost of all other ancillary land of the MRF property shall be apportioned in the same amounts to that of the interior footprint of the building as determined through the application of P.1 through P.10.</p>	<p>1st – Application of P.1 to P.10.</p>
<p>P.25: Labour costs for sorters shall be allocated based on the percentage of time spent sorting each material. Time is determined by counting the number of pieces of each material and converting the piece counts by material to a percentage of time per hour.</p>	<p>1st – time via piece counts</p>
<p>P.26: Labour costs for front end loader and skid steer operators shall be allocated based on time spent handling each material. Where commingled streams are managed, the time by stream shall then be apportioned by the volume of each material within the stream.</p>	<p>1st – time 2nd – volume</p>
<p>P.27: Labour costs for fork lift truck operators shall be allocated based on time spent handling each material.</p>	<p>1st – time</p>
<p>P.28: Labour costs for baler operators shall be allocated based on time spent handling each material. Where there are blended bales, further allocations shall be done on the basis of the relative volumes of each material within the bale.</p>	<p>1st – time 2nd – volume</p>
<p>P.29: Labour costs for weighscale operators should be allocated based on the same principles as applied to the weighscale itself, i.e., number of loads inbound apportioned by onboard volumes and number of loads outbound, apportioned by load equivalents.</p>	<p>1st – inbound and outbound load volumes 2nd – volume</p>
<p>P.30: Labour costs for shift managers should be allocated based the allocations of all staff for each material, under the assumption that the shift manager manages people and people are there relative to the specific materials.</p>	<p>1st – time by sorters</p>

Processing (P) Assumption	Cost Driver(s)
P.31: The cost of administration staff shall be allocated first to those materials which cause the cost directly (based on time spent) and then, the balance should be allocated equally to all materials.	1 st – material specific – time 2 nd – equally to all materials
P.32: Labour costs for supervisory staff shall be allocated first to those materials which cause the cost directly and then secondly on the basis of the number of materials processed at the facility. This is based on the premise that the supervisor is responsible for the delivery of the program and, as such, as materials are part of the program, they should share in the delivery cost equally.	1 st – material specific 2 nd – number of materials
P.33: The cost of maintenance staff shall be allocated first to those materials which cause the cost directly and then by volume.	1 st – material specific 2 nd – volume
P.34: The cost of general labour staff shall be allocated first to those materials that cause the cost directly and then, the balance should be allocated equally to all materials.	1 st – material specific 2 nd – equally to all materials
P.35: If a stream is bag based, the costs of bag opening and removal shall be apportioned to that stream only and then on the basis of the volume of each material within that stream. In a commingled collection program, where some materials show up in bags in some proportion, the cost of any preprocessing for the removal of materials from bags shall be allocated to all materials in the stream on the basis of volume.	1 st – volume
P.36: Common labour time and costs incurred by sorters doing their cleanup at the end of the shift (i.e., not general janitorial cleaning) shall be allocated first to those materials that cause the cost, if known, and then to materials based on the volumes of each material processed.	1 st – material specific 2 nd – volume
P.37: If equipment is used to process more than one material at different times during the operating cycle, maintenance costs should first be allocated based on the relative times the equipment is used for those materials.	1 st – time
P.38: Whenever possible, general maintenance costs (or the portion of maintenance costs) directly attributable to an individual material shall be allocated to that material.	1 st – material specific

Processing (P) Assumption	Cost Driver(s)
P.39: Remaining equipment maintenance costs shall be allocated to individual materials using the same approach as the capital cost allocation for that equipment. Refer to P.11 to P.21.	1 st – material specific 2 nd – see P.11 to P.21
P.40: The fuel cost of rolling stock shall first be allocated based on the time the equipment is used to handle individual materials. Allocation within a material stream shall then be based on the volume of individual materials handled within each stream.	1 st – material specific 2 nd – volume
P.41: The cost of baling wire shall be allocated to individual materials baled based on the number of bales of each material marketed and the appropriate wire usage per bale.	1 st – material specific
P.42: All electrical costs shall be allocated to each piece of processing equipment based on the calculated electrical usage for that equipment. These costs then should be allocated according to the equipment capital cost allocation. Refer to P.11 to P.21.	1 st – material specific 2 nd – see P.11 to P.21
P.43: Where there is the removal of residue in the last bunker preceding the negative sort, all costs associated with that removal shall be allocated to the negative sort material(s). Where there are multiple materials in the negative sort, the cost of residue removal is shared by all materials in the final stream on the basis of the volume of each material in that stream.	1 st – material specific 2 nd – volume
P.44: The cost for the removal of residues in the pre-sort area of a MRF shall be allocated to all materials in that stream on the sorting line based on the relative volume of each material in that stream.	1 st – all materials 2 nd – volume
P.45: The cost for the removal of residues (capital and operating) at any point after a major break in the sorting function as a result of a piece of equipment (defined as air classifier, flats-rounds separator, OCC screen, ONP screen) that produces two (or more) streams of materials, shall be allocated to only those materials downstream of the piece of equipment and on the basis of the relative volume of each material in that stream.	1 st – downstream materials 2 nd – volume
P.46: The cost for the removal of residues at any location in a manual sorting system (i.e., no automated separation equipment, as may occur in smaller facilities) shall be allocated to all materials downstream of the point of removal of residues (into a bunker or dumpster (not residue removal to a garbage can or small bin on the sorting platform) in that stream on the sorting line based on the relative volume of each material in that stream.	1 st – all materials 2 nd – volume
P.47: The shipping and disposal costs for the management of residues shall be allocated to each material on the basis of the weight of the material managed.	1 st – weight

Processing (P) Assumption	Cost Driver(s)
<p>P.48: General operating costs should be assigned to individual material as an additive cost based on the percentage cost allocations in total determined through the application of principles P.1 to P.48. This approach will not make any material change to the total percentage allocation of costs to individual materials.</p>	<p>1st – additive cost based on allocations of all costs for P.1 to P.48</p>

