



London
CANADA



**Implementation of a Sustainable Financing Structure For
Solid Waste Management in Ontario**

Discussion Paper #5

**Sustainable Financing Approaches for Multi-
Family Buildings**

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Prepared For



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1. How Municipalities Finance Waste Management for Multi Family Buildings

The approach taken to providing multi-family garbage and recycling services varies considerably from municipality to municipality. Some municipalities have chosen not to provide any waste management services to rental multi-family buildings or condominiums while others provide a full complement of services to both. Some municipalities, when surveyed, have indicated that they provide waste management and recycling services but when queried further, it becomes apparent that the multi-family waste management services are limited. The manner in which the services are financed also varies from community to community. Table 1.1 provides a snapshot of the waste management services provided to multi family buildings by large urban municipalities in Canada and the range of financing approaches the use. Further discussion of each follows.

Table 1.1: Provision of Waste Management Services to Multi Family Buildings in Carge Urban Centres in Canada

Municipality	Multi Family Waste Management Services		Financing			
	Garbage Services	Recycling Services	Property Taxes	Flat Fees	PAYT	Other
British Columbia						
Victoria/CRD	no	depot				√
Vancouver - Pre 2006	√*	√		√		
Vancouver – Post 2006	√*	√		√		
Region of Nanaimo	no	depot				
Alberta						
Calgary	√**	depot	√			
Edmonton	√	√	√	√		
Airdrie	no	depot		√		
Lethbridge	√	depot			√	
Prairies						
Saskatoon	√	depot	√			
Winnipeg	√	√	√			√
Ontario						
Ottawa Pre- 2006	√	√	√			
Ottawa Post - 2006	√	√	√	√		
Toronto	√	√	√			
Peel	√	√	√			
Sudbury	√	√	√	√		
Hamilton	√	√	√			
Maritimes						
Halifax	no	no				
Charlottetown	√	√		√		
St. John's	no	no				

√* provides services for maximum 10 garbage cans

√** provides services to condominiums only

City of Victoria/CRD, British Columbia

The City of Victoria is responsible for providing garbage collection services and the Capital Regional District (CRD) provides recycling services. Neither the City nor the Region provide garbage collection or

recycling services to multi-family buildings and condominiums. Buildings must contract with private sector companies to provide collection services.

From 1989 to 2000, the CRD contracted out apartment recycling services. In May 2000, the CRD eliminated the collection service and replaced it with a funding initiative, in which all buildings with five or more units are eligible for funding if they collect the same materials as the curbside blue box program. The CRD provides funding to building owners to pay for private recycling services if the building owners sign an agreement with the CRD in order to receive funding. Funding ranges from \$7 to \$16 per unit per year based on the size of the building (see below). The CRD reports that 80% of qualified buildings participate.

Building Size	Annual Funding Rebate per Unit For Provision of Recycling Services	Minimum	Maximum
5 to 10 units	\$16	\$80.00	\$160.00
11 to 30 units	\$11	\$160.00	\$330.00
31 to 75 units	\$8.50	\$330.00	\$637.50
More than 75 units	\$7	\$637.50	----

City of Vancouver, British Columbia

The City of Vancouver provides limited waste collection services to multi-family buildings, including condominiums but offers on-site recycling services to all buildings. Prior to 2006, the City will provided collection of up to 10 garbage cans to multi-family buildings, after which the building owner was required to contract out the services with the private sector. All buildings are provided with carts for collection of recyclable containers and are charged a flat fee based on the number of stops and units in the building:

- ▶ \$10 for each “collection point” or stop
- ▶ \$9 per dwelling unit

With the implementation of the automated cart program in 2006, small multi-family dwellings (e.g. 4-plexes and 6-plexes) can receive curbside garbage collection if they meet with the approval of the city. The buildings are charged according to the number and size of garbage carts used.

City of Nanaimo, British Columbia

The City does not offer any waste management services to multi-family buildings.

City of Calgary, Alberta

The City of Calgary offers waste collection services to condominiums only. Condominiums are entitled to one bin collected weekly. These services are paid through the property taxes. In addition, condominiums must rent the bin and pay for additional bins and pick ups. All collection services are provided by City crew.

Multi-family buildings, not entitled to waste collection services, can arrange for City-provided commercial services on a fee for service basis. The City offer collection containers in sizes ranging from 2 to 40 yards. The City does not provide on-site recycling services to multi-family buildings. Residents may use any of the 50 recycling depots located throughout the city.

City of Edmonton, Alberta

The City provides waste collection and recycling services to all multi-family buildings (rentals and condominiums) by contracting out the services to the private sector. Multi-family buildings pay for garbage and recycling collection services through their property taxes and pay for disposal and

processing through flat fees. The average multi-family unit pays \$16 per year on property taxes and \$103 per year in flat fees for waste management services.

City of Airdrie, Alberta

Multi-family buildings, including condominiums, do not receive waste or recycling collection services from the City. All single-family and multi-family residents can access the one recycling depot provided by the City (no curbside collection service is provided). Multi family units are charged a bi-monthly environmental fee of \$6.99 (\$42 per year) to cover the costs for the recycling depots, community composting, household hazardous waste collection and spring clean up.

City of Lethbridge, Alberta

Written in its solid waste by-law, the City of Lethbridge requires that multi-family buildings (including condominiums) use City waste collection services. The City provides commercial waste services charging variable rate fees based on the size of the bin and frequency of collection (see later section for detail). Over the years, however, buildings have been allowed to opt out of the system and hire private haulers. The City is trying to rectify the situation and regain its lost multi-family accounts.

The City does not provide on-site recycling services and directs multi-family building owners to private recycling companies or City-provided recycling depots. The buildings are not charged for recycling services.

City of Saskatoon, Saskatchewan

City crew provide waste collection services to multi-family buildings which is paid for through property taxes. No on-site recycling services are provided. All residents can use City funded recycling depots, which are also funded through property taxes.

City of Winnipeg, Manitoba

The City provides waste collection and on-site recycling services to multi-family buildings (including condominiums), which is contracted out to the private sector. The costs are covered through property taxes. The average cost per year for garbage collection services is \$32 per multi family unit. Recycling services are funded through tipping fees and funding from the Manitoba Product Stewardship Corporation.

When the recycling program for multi-family buildings was launched in 2001, the City provided an opt out policy for those building owners who do not want to participate. The building owners are required to send the City a fax requesting to opt out. Only 10% have chosen to opt out of the recycling program. The provision of garbage collection services is not tied to participation in the recycling program.

City of Ottawa, Ontario

All multi-family buildings, including condominiums, receive garbage collection and recycling services. The City contracts out the collection services to private sector companies. Buildings are provided with once a week basic service. The City provides garbage container collection service and bases the size of the container on a formula which permits a designated amount of waste per unit. Anything over the limit is charged on a per tonne basis. See later section for detail.

The City also provides recycling carts and collection to all multi-family buildings receiving garbage collection. The building must participate in the recycling program in order to receive garbage collection services. The contracted private haulers must provide detailed collection reports for each collection truck and collection route and are paid by the lift, receiving more for recycling than garbage.

Under the City's new waste financing system, multi-family buildings are charged an annual flat fee of \$32.40/unit/year which pays for garbage collection and disposal. Recycling services will continue to be funded through property taxes and WDO funds.

City of Toronto, Ontario

The City provides waste collection and on-site recycling services to over 5,000 multi-family buildings (including condominiums), which represents almost 97% of all multi-family buildings in the City. The collection is contracted out to the private sector. The costs are covered through property taxes.

In an effort to improve diversion to support the City's goal of achieving 70% diversion by 2010, it introduced a volume based solid waste management fee in 2008, to provide a financial incentive to building owners to reduce waste. See later section for details.

Region of Peel, Ontario

The Region of Peel provides waste collection and on-site recycling services to multi-family buildings (including condominiums), which is contracted out to the private sector. The costs are covered through property taxes. The Region is currently undertaking a pilot program, funded under Stewardship Ontario's E&E fund, testing weight based collection of garbage and recyclables (see later section).

City of Sudbury, Ontario

The City of Sudbury provides waste and recycling services to rental multi-family buildings and condominiums. The property owner is required to sign an agreement and is provided with a garbage bin and recycling carts. The building pays a fee of \$19/unit per year for recycling which entitles them to garbage collection (one lift per week). The fee is charged annually on a separate bill. Currently, condominiums not only pay the unit fee but each unit owner must also pay for waste services through their property taxes. City of Sudbury staff hope to change its financing structure for the condominiums to remove the waste management unit fee charge and continue to provide service through property taxes collected from each individual unit owner. The buildings can opt out and use the private sector which does not impact property taxes.

City of Hamilton, Ontario

All multi-family buildings are provided garbage and recycling service by the City. The City applies a general rule for the amount of garbage that can be generated by a building. Each group of 10 units are estimated to produce 3 cubic yards of waste per week. Each 10 unit increment is permitted 3 cubic yard of waste, therefore, a building with 30 units is permitted to produce 9 cubic yards of waste per week. The City also provides recycling services to all multi-family buildings. All waste management services are funded through property taxes.

City of Halifax, Nova Scotia

The City does not offer any waste management services to multi-family buildings; however, it requires that each building provide recycling and organic collection services. All services must be contracted to the private sector.

City of Charlottetown, Prince Edward Island

Under provincial legislation, all residents in PEI must have access to three stream waste management services, including residents residing in multi-family buildings (including condominiums). Most multi-family buildings in the City of Charlottetown are low and medium rise buildings. Building owners are provided with 240 litre carts (green for organics and black for waste) and blue bags for recyclables. The containers must be centrally located but accessible by truck. Smaller buildings require residents to set recyclables in blue bags at the curb and larger buildings have the option of providing a centrally located cart for tenants to use. All services are funded through a Waste Watch Fee (\$195/year) that is added as a separate line item on the property tax bill.

City of St. Johns, Newfoundland

The City does not offer any waste management services to multi-family buildings.

2. PAYT for Multi-Family Buildings

There are some interesting case studies of communities in Canada, the United States and Europe that have developed innovative ways to apply the principles of PAYT to multi-family buildings. Table 2.1 summarizes the innovative multi-family PAYT approaches that are under development or currently in use.

Table 2.1: PAYT Programs For Multi-Family Buildings

Community	Program	Description	Status
Canada			
City of Toronto, Ontario (population 2,400,000)	Multi-Unit Waste Reduction Program	- a financial fee applied to additional waste generated by a building	Implemented
City of Orillia, Ontario (population 30,000)	Partial User Pay Program	- a financial levy applied to additional waste generated by a building	Implemented
Region of Peel, Ontario (population 1,000,000)	Weight based Pilot	- piloting a program to weigh the waste and recyclables generated by MF buildings	Implemented
City of Ottawa (population 850,000)	Extra Service Charge	- a formula is used to determine the basic service provided to a building and any additional service is charge separately	Implemented
City of Lethbridge, Alberta (population 77,000)	Variable Rate PAYT Program	- building owners decide what size bin they need and pay according to bin size and frequency of collection	Implemented
United States			
City of Seattle, Washington (population 563,000)	Variable Rate PAYT Program	- building owners use a formula to determine the size of bin and are charged variable rates based on size and frequency of collection	Implemented
City of San Jose, California (population 895,000)	Variable Rate PAYT Program	- building owners decide what size bin they need and pay according to bin size and frequency of collection	Implemented
Europe			
European communities	The Chamber system	- a specially designed unit is attached to the top of a garbage bin and users must pay to deposit garbage in the bin	Being piloted in a number of communities in Austria, Germany and Italy

3. Toronto's Multi-Unit Waste Reduction Levy (Toronto, Ontario)

Until mid-2008, all waste from multi-family dwellings – nine units or more - in City of Toronto was collected by the City under contract, and no limits applied. In order to boost multi-residential diversion rates, the city introduced the “Multi-Unit Waste Reduction Levy” in July 2008. The levy approach is expected to boost the diversion rate from its current ~13% to ~26% blue box diversion rate.

The program targets all multi-residential buildings, with eight or more units, receiving city garbage collection services (cubic yard bin collection service), including apartments, condominiums, townhouse complexes and cooperatives. Under the program, each building is permitted to generate a fixed volume of waste that is collected “free of charge” (the actual collection and disposal costs remain covered by property taxes). The formula used to determine the volume of waste is based on a rule that multi-residential residents should be able to divert recyclables on a par with single family residents which is measured to be a 60% capture rate of available Blue Box materials (fibres and containers).

It is assumed that each multi-family unit generates 680 kg per year (excluding bulky goods). Of this, it is assumed that 44% is potential blue box material (680 kg x 44% = 299 kg per year is blue box material). Of this, it is assumed that residents can divert 60% of available blue box materials (299 kg x 60% = 180 kg per year of divertable blue box material). After subtracting the diversion rate (180 kg/yr) from the annual generation rate (680kg/yr), each unit is entitled to generate 500 kg/year of garbage. This is converted to compacted and un-compacted volumes as shown in Table 3.1. The compaction rate was set at 3:1 for initial calculations based on field test results.

Example of the City of Toronto Formula in use for a 100 unit building

Per Unit Calculation:

- ▶ Waste generation rate per unit = 680 kg/hh/yr
- ▶ Portion of the waste that is Blue Box materials = 44% x 680 kg/hh/yr = 299 kg/hh/yr
- ▶ Blue Box capture rate = 60% x 299/kg/hh/yr = 180 kg/hh/yr
- ▶ “No charge” waste generation rate = 680 kg/hh/yr – 180 kg/hh/yr = 500 kg/hh/yr
- ▶ 500 kg/hh/yr = 2.4 yd³ compacted waste/yr or 5.4 yd³ uncompacted waste/yr

Under the program, property owners of multi-unit residential buildings will pay a fee based on how much garbage the building generates during the billing period and the number of units in the building. Similar to the single family residents the new solid waste fee will appear with water fees on a new, combined Toronto Water/Solid Waste utility bill. A credit of \$157 per unit will be applied to the multi-residential building and be will provided to the owner/property manager. There is no fee for recycling; buildings that reduce garbage and increase recycling will therefore pay less.

As long as the building stays within the designated volume limit there is no levy charged. However, if the designated volume limit is exceeded a differential levy is charged on the extra waste generated. The rates to be charged are presented in Table 3.1.

Each bin has a transponder which sends information electronically (i.e. location, date, container volume) to a central database when each collection takes place. The bins will not be weighed as the Toronto program is not intended to be a weight based system. Collection staff will record the number of bins collected. One key feature of the Toronto multi-family system is that each bin with a compactor is charged the compacted rate (3 times the un-compacted rate) whether the contents were compacted or not. Also, each bin is assumed to be full when collected (no allowance for partially full bins)

Table 3.1: Toronto's Multi-Family Levy Variable Fee Chart

City of Toronto Un-Compacted Lookup Table				
Lookup Table Unit	yd3/unit/month	yd3/unit/month	fee adjustment	Equivalent Bin Size
	lower limit	upper limit	\$/unit/mo	
yd3/unit/month	0.0000	0.1417	-\$0.58	S
yd3/unit/month	0.1427	0.2267	\$1.50	M
yd3/unit/month	0.2277	0.4534	\$4.00	L
yd3/unit/month	0.4544	0.6801	\$6.50	XL
cubic yard fee	0.6811	1.0000	\$9.56	XL+
City of Toronto Compacted Lookup Table				
Lookup Table Unit	yd3/unit/month	yd3/unit/month	fee adjustment	Equivalent Bin Size
	lower limit	upper limit	\$/unit/mo	
yd3/unit/month	0.0000	0.0472	-\$0.58	S
yd3/unit/month	0.0482	0.0756	\$1.50	M
yd3/unit/month	0.0766	0.1511	\$4.00	L
yd3/unit/month	0.1521	0.2267	\$6.50	XL
cubic yard fee	0.2277	1.0000	\$28.67	XL+

In addition, the program will require hiring new By-law enforcement officers to monitor buildings. The number of staff is to be determined.

According to staff, awareness of the levy system has made some building owners more interested in recyclables and organics diversion opportunities with some building owners indicating that they would be willing to participate in an organics program in order to avoid the levy while other building owners have acquired more recycling bins in anticipation of the levy program. The first bills were distributed in January, 2009.

4. Orillia's Partial User Pay Program (Orillia, Ontario)

The City of Orillia introduced a partial user pay program in 1997 for its single family residences. This involves mailing 40 tags to each household every year and requiring residences to purchase additional tags (at a cost of \$1.50 per tag) when they have used up the mailed tags. The City applies the single family partial user pay program to smaller, low rise multi family buildings with less than 10 units. The majority (78 buildings) of the 120 multi-residential buildings in the City of Orillia fall into the low rise category. The City has adapted its user pay approach for larger multi-residential buildings.

Buildings with 9 or more units (42 buildings) use front end loading bins for garbage. In 1997, the City adapted the partial user pay program for multi-residential buildings. The City developed a formula for calculating bin size based on the number of units and number of equivalent garbage tags that would be distributed. The City multiplies the number of units by the free tag allotment for the year. The City assumes that six bags of garbage take up one cubic yard of space to calculate the bin size for each building. Since the smallest bin size is two cubic yards, this is the smallest size that can be allocated to a building. The size of available bins includes 2 yd³, 4 yd³, 6 yd³, and 8 yd³. Any fraction is rounded up to the larger bin size (e.g. 2.5 cu yd is rounded to 4 cubic yard bin).

Example of the Formula for a 100 Unit Building:

- ▶ 100 units x 40 tags/yr = 4000 bags of garbage per year
- ▶ 4000 bags / 6 bags/yard³ = 670 yd³ per year
- ▶ 670/52 weeks = 12.9 yd³ per week (round up to 13 yd³)
- ▶ the building would be issued one 6 yd³ and one 8 yd³ bin

Buildings are not charged for collection of the bins if they keep to the size of bin allocated. The contractor charges \$65/month for rental of each bin although the fee is waived if the landlord purchases his or her own bin. Recycling is provided at no charge. The costs are covered on the property taxes. If a building wants a larger bin, they have to pay for it. The extra cost is based on tag price; therefore, every additional cubic yard costs \$9 per week with a minimum size of 2 yd³ which costs \$18 per week (\$936 per year). Buildings are invoiced monthly for the additional collection services.

The City offers organic collection to apartment buildings but few building owners have taken up the offer. Those multi-family buildings involved in organics collection receive 95 gallon carts (360 litres) which are located by the recycling carts. Apartment tenants have the option of placing leaf and yard waste in clear plastic bags at the curb.

According to City staff, the partial user pay multi-residential program is working well and helps to equalize apartments with the single family partial user pay program.

5. Weight Based Pilot in the Region of Peel

The Region of Peel has embarked on the Multi-Residential Project (PMRP) to help it meet its goal of 70 per cent diversion from disposal. The PMRP aims to solve the issue of low recovery of recyclables in multi-residential buildings. The pilot study started in December, 2008 following a number of delays, and will study on-board weigh scales attached to front-end collection vehicles used for collecting garbage from multi-residential buildings. The scales will measure and record the weight of waste and recyclables collected from selected buildings. This study is the first of its kind in Ontario.

The onboard weigh scales will allow Peel to record the weight of waste and recyclables generated on a per building basis. The waste generation data will be used to investigate the financial impacts of enforcing a weight-based PAYT program.

Under Peel's Two Bag Standard Program a single family dwelling or a unit within a multi-residential building can set out 2 bags or containers of garbage that together weigh no more than 40 kg (88 lbs) per week. For example, this means a multi-residential building of 50 units with or without a compacter is permitted up to 2,000 kg (4,400 lbs) of household garbage each week. One barrier Peel currently faces is the lack of tracking capabilities to determine whether or not multi-family buildings are in compliance with these weight restrictions.

The pilot is scheduled to be completed before the end of 2008.

6. Ottawa's Extra Garbage Service

The City of Ottawa provides completely subsidized collection for recyclables and once a week subsidized collection of waste to the multi-unit residential sector (MURS). The collection must be effected in dedicated collection vehicles with no mixing of wastes from the ICI sector, even for extra collections. All materials collected are directed to facilities which report their data (either directly or via an internet connection) to the city's solid waste database. Almost all payments for MURS collection is based on the number of lifts rather than the weight of material collected. The only exception is the recyclables collected in wheeled 240 litre carts, which are paid for based on weight.

The allocation of bin capacity for all multi-unit residential garbage has been set at 8.3 kg per unit, and any extra collection beyond once a week in the multi-residential sector requires partial or full payment by the building owner (discussed later).

A) If a building does not have sufficient space to accommodate it's allotment of garbage bin capacity for a week, the City will pay 50% of the lift rate, and the building owner will be required to pay the remaining 50% of the lift rate to the contractor. See Table 6.1 for rates.

B) If a building requires extra collection of waste beyond their weekly allotment on a regular scheduled basis, they are required to pay for the lift fee +20% of the lift fee+ the tipping fee for the garbage at the Trail Waste facility (where the material must be taken). Buildings are allowed up to 3 scheduled extra collections per week. See Table 6.2 for calculations.

Table 6.1: Ottawa's Extra Bin Rental Rate

	Monthly Rental Fee				
	2 yd	2 yd with castors	3 yd	3 yd with castors	3 yd C
Lease (\$/month)	\$14.00	\$19.00	\$15.00	\$20.00	\$22.00
Maintenance (\$/month)	\$18.00	\$18.00	\$18.00	\$18.00	\$18.00
Total	\$32.00	\$37.00	\$33.00	\$38.00	\$40.00
	4 yd	4 yd with castors	4 yd C	6 yd	8 yd
Lease (\$/month)	\$19.00	\$25.00	\$23.00	\$21.00	\$30.00
Maintenance (\$/month)	\$18.00	\$18.00	\$18.00	\$18.00	\$18.00
Total	\$37.00	\$43.00	\$41.00	\$39.00	\$48.00
Prices of the lease are the current prices less 6.00\$					
* All compacted FEL bins have castors					
Winching*					
Cost per metre per bin (one way) where a 2 man operation is required = \$0.75					

*Winching is a charge applied to each container that must be moved by the collection crew to the truck for dumping. Winching requires the Contractor to bring out the bin, collect the content and return the bin to its original location.

C) If a building requires an unscheduled collection, or collection beyond the 3 scheduled weekly collections, they are required to pay the lift fee +50% of the lift fee plus the tipping fee for the garbage at the Trail Waste Facility (where the material must be taken). See Table 6.2 for calculations

Table 6.2: Additional Service Tipping Fees For Multi-Family Buildings in the City of Ottawa

The tipping fee per bin shall be calculated as follows:			
$\frac{(\text{Bin Weight in kgs.}) \times (\text{Tipping Fee})}{1000 \text{ kgs.}}$			
The following table shall be used to calculate bin weights:			
Bin Size in Yards Cubed	Loose Bin Weights (55 kgs per yard)	Garbage Chute Bin Weights (75 kgs per yard)	Compactor Bin Weights (135 kgs per yard)
2 Yd	\$110	\$150	\$270
3 Yd	\$165	\$225	\$405
4 Yd	\$220	\$300	\$540
6 Yd	\$330	\$450	\$810
8 Yd	\$440	\$600	\$1080

To manage the contract payments to collection contractors, the City of Ottawa, has developed an Oracle apartment database which contains a complete inventory of bins (by material type, compaction type and size). The contractor, through an internet interface (standard browser), enters exceptions (which bins were NOT collected) along with the reason why. The contractor also maintains a list of vehicles, the routes they are assigned to, and which days each bin is collected.

At the beginning of each month a report is run which calculates the number of weekly regular scheduled lifts for garbage and recycling, by calendar day, by contractor for the service paid by the city. This is compared to the invoice from the contractor and any exceptions are reconciled. The amount of residual from the MRF is subtracted from the amount owing to the collection contractor. Any extra tonnage resulting from extra services is captured in the Solid Waste Oracle Database through the Trail Waste Facility. The regular weekly tonnage is also captured at the Trail Waste Facility as well as in the Solid Waste Database as well.

Extra services are paid for by the building owners (with the exception of (A) above) and contracted between building owners and the collection contractor, with pricing guaranteed by the city under it's collection contract. Building owners, if they own their bin(s) for waste, may contract with a different collection contractor for extra services, but this is rarely done. All recycling bins are owned by the city.

Prior to the beginning of the current collection contract another apartment database report was developed to help staff identify which apartments were over-allocated, or under allocated garbage capacity. This report combines information from the bin inventory with the number of apartment units at a given site, and values from a table of calculated densities to determine what the capacity of each site is in kgs per unit. This report helps staff to determine whether more or less bins are required, IF and WHEN the threshold value is ever changed from 8.3 Kg. per unit. In effect, the report allows the city to "reduce waste limits" and immediately identify the impact on all MURS locations.

7. Lethbridge’s Variable Rate PAYT Program (Lethbridge, Alberta)

The City of Lethbridge has a mixed program servicing multi-family buildings. The city provides garbage collection services to multi-family buildings and condominiums but each can opt out of the program and hire private haulers. The City charges commercial collection rates to multi family buildings and condominiums based on the size of the bin and frequency of collection. All residents rely on recycling depots to divert their recyclables, no curbside collection or collection at the multi-family buildings is provided by the City.

The City has no policy or program to restrict the amount of waste generated or to promote waste diversion in multi-family buildings. The biggest problem facing the city is with landlords that are choosing inappropriate bin sizes resulting in litter problems. The majority of building owners have selected the right size of bin but the City is having some problems with landlords that are finding other places to discard waste (e.g. back alleys). The City is reviewing its by-law to see if it can take a more aggressive role in determining the size of the bin that each building should be allocated. Currently the City is dealing directly with the landlord by phoning them and telling them that they have to have a proper size of bin. The City is also using the “Clean Lane Campaign”, which has been written into a by-law, to ensure that lanes/alleys remain clean. If a landlord leaves garbage in the lane the city asks the landlord to remove it. If the garbage is not removed the City cleans up the garbage and sends the landlord a bill.

Currently, the City is competing with the private sector for multi-family building accounts, despite the fact that all MF services are to be provided by the City under its solid waste by-law. The city has slowly lost business over the past 10 – 15 years and currently maintains about 40% of apartment collection accounts and 50% of condominium accounts. The City hopes to regain more of the multi-family building collection business over the next several years.

Whenever there is an application for a condominium development, the City must ensure that the waste storage and handling area meets City by-laws. The City will remind the building owner that they have to use the City for waste management services as written in the by-law. The City faces more difficulty getting existing buildings to use City services. The City plans to slowly win back multi-family customers with consistent rates and a no contract policy. The rates are published in the by-law and do not change unless the by-law is changed. Furthermore, the City does not require the customer to sign a contract as is required by the private sector.

Table 7.1 provides the collection rate schedule as published in the solid waste by-law in 2007.

Table 7.1: City of Lethbridge 2007 Variable Collection Rates

Bin Size (yards)	Monthly Rate (\$/pickups/week)				
	1 pickup per week	2 pickups per week	3 pickups per week	4 pickups per week	5 pickups per week
1.50	\$35.79	\$75.08	\$110.13	\$146.79	\$183.06
2.00	\$46.20	\$92.16	\$137.52	\$182.19	\$226.08
3.00	\$68.22	\$132.06	\$194.34	\$256.98	\$312.63
4.00	\$89.73	\$170.64	\$248.22	\$321.75	\$390.06
6.00	\$131.34	\$243.39	\$346.41	\$438.54	\$518.88
8.00	\$171.03	\$309.99	\$430.92	\$531.27	\$611.07

8. Seattle's Variable Rate PAYT Program (Seattle, Washington)

The City of Seattle uses a variable rate fee approach for garbage collection at multi-residential buildings. The variable rate system is based on a formula that takes into account the number of units in each multi-family building and their size. The formula also accounts for recycling (which is assumed to be half of the garbage) to identify the number of recycling containers.

The formula assumes that each one bedroom unit generates 1 can of garbage per week. A two bedroom unit is estimated to generate 1.5 cans of garbage per week and so on. The building manager must identify the total number of one, two and three+ bedroom units in the building and estimate the garbage generated using the formula. The total is then divided by 7 to estimate the number of cubic yards of garbage generated by the building each week (e.g. if a building has 28 one bedroom apartments, it creates 28 cans of garbage per week, or 4 cubic yards). If the building has a compaction system it is required to divide the number of cubic yards by 4 to get the number of compacted cubic yards most compactors will achieve (e.g. the building with 4 cubic yards of garbage would have 1 cubic yard of compacted garbage).

Example of the City of Seattle's Formula for a 100 Unit Building:

- ▶ a one bedroom unit is entitled to generate 1 can of garbage per week
- ▶ a two or more bedroom unit is entitled to generate 1.5 cans of garbage per week
- ▶ assume the 100 unit building as only one bedroom units
- ▶ 100 bedroom units x 1 = 100 cans of garbage per week
- ▶ 100 cans divide by 7 = 15 yd³ per week of uncompacted garbage or
- ▶ 100 cans divide by 7 then divide by 4 = 3.8 yd³ per week of compacted garbage

The building manager or owner must meet with a Seattle Public Utilities inspector to determine the appropriate container size and location and complete the Container Agreement Form (see Appendix A) which is sent it to the contractor who will service the building. Property managers are billed directly for garbage collection service. Recycling is incorporated into the garbage bill. Appendix B provides a copy of the compacted and un-compacted dumpster rates. The rates are based on the size and number of containers and the frequency of pick ups. In addition, there is a US \$0.65 weekly charge per unit and extra garbage charges of US \$5.00 per 32 gallon cart. Additional collection charges are issued for bulky waste and white goods collection at US \$28.85 per item.

The collection rates are set by the City Council every two years and building owners are issued monthly utility bills by the City. In 1999, the City explored an option of establishing two-tiered rates with a lower rate charged to buildings involved in recycling and a higher rate charged for buildings not involved in recycling. The suggestion was rejected.¹

The City of Seattle is re-considering weight based billing in the future, but would need to address it when the City goes out to tender its new contracts in 2009.

¹ SERA. 1999. Movin' On Up: Strategies for Increasing MultiFamily Recycling

9. San Jose's Variable Rate PAYT Program (San Jose, California)

The City of San Jose contracts its garbage and recycling collection services to the private sector. Multi-residential buildings subscribe to variable rate container service with rates based on bin size and number of collections per week (see Table 9.1). Owners incur additional charges if the hauler must move the bin into a serviceable position. Bins sizes range from 1 yd³ bins to 8 yd³. Additional charges are incurred if the bins must be pushed to the truck. Garbage rates include once a week collection of the same size of recycling bin or roll out carts. Recycling services are at no charge.

The City offers free site assessments to building owners to help them assess the building's garbage and recycling needs and opportunities to save money.

Table 9.1: San Jose Multi-Residential 2008 Monthly Garbage Collection Rates (US\$)

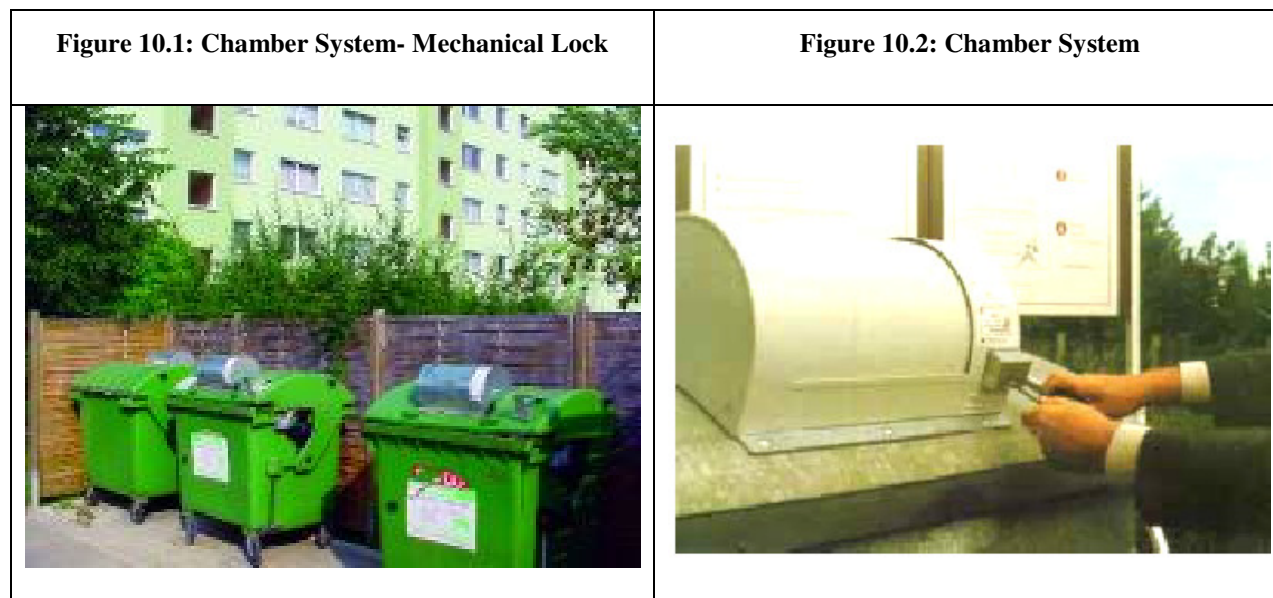
Bin Size	Number of Collections Per Week					Extra pickup
	1	2	3	4	5	
1	\$81.03	\$146.74	\$212.48	\$278.22	\$343.96	\$34.86
1.5	\$101.77	\$186.70	\$271.65	\$356.60	\$441.54	\$39.68
2	\$123.05	\$227.21	\$331.38	\$435.53	\$539.68	\$44.51
3	\$164.62	\$307.21	\$449.79	\$592.36	\$734.93	\$54.17
4	\$206.21	\$387.21	\$568.19	\$749.20	\$930.21	\$63.84
6	\$289.36	\$547.22	\$805.05	\$1,062.90	\$1,320.76	\$83.14
8	\$372.51	\$707.21	\$1,041.88	\$1,376.59	\$1,711.28	\$102.45

10. Chamber System in Europe

In some European countries, a technology referred to as the chamber system (also referred to as a “waste lock” or “lockhopper” technology) is used to monitor and control the amount of waste disposed by multi-family households in complexes where bins are shared. The chamber looks like a chute attached to the top of a bin or dumpster (located outdoors). The user accesses the chamber (chute) using a smart or chip card or an electronic key. The card or key opens the “gate” and the waste is placed in the chamber. When the “gate” is closed the waste drops into the container and the card or key is returned. The amount of waste deposited in the chamber is recorded by volume or weight and the user is then billed or prepaid credits are deducted directly from the card. Some sophisticated chamber systems send radio signals to a waste hauler when the bin is full and needs to be emptied. The chamber systems can be used on bins as small as 1.1 m³ (1.4 yd³) to 8 m³ (10 yd³). See Figures 10.1 and 10.2.

The chamber system is credited with reducing waste sent for disposal by 30 – 50%² in some locations. However, it should be noted that European communities are characterized by low and medium rise MF buildings that do not use chute systems within the buildings to collect garbage. Many buildings rely on outdoor collection stations to service tenants. This approach lends itself to the chamber system.

² Reichenbach, Jan. March –April, 2005. *Pay as you Throw*. **Waste Management World**



Source: figures from Jan Reichenbach. March –April, 2005. *Pay as you Throw*. **Waste Management World and** *Economia Research and Consulting*. No date. **Financing and Incentive Schemes for Municipal Waste Management – Case Studies**. Report to Directorate General Environment, European Commission

Several communities in Germany, Austria and Italy have begun using the chamber system for multi-residential buildings. German communities employing the technology include the cities of Sndelfingen, Dresden and Ohrekreis. In the community of Ohrekreis (Sachsen-Anhalt) a pilot project was implemented to test a weight based user pay system for multi-residential buildings over a period of five months. In the pilot, an outdoor garbage and recycling centre was established to serve a block of five story flats (about 800 tenants). The garbage bins (dumpsters) were retrofitted with “chamber” systems that weighed the waste and charged a fee. Residents used a smart/chip card that they swiped in order to have access to the chamber. The fee was administered through the card. A comparison of the results is provided in Table 10.1.

Table 10.1: Results of the Multi-Residential User Pay Pilot Project in Ohrekreis, Germany

	Before Weight Based System	After Weight Based System
Reduction in Waste		~45%
Contamination in Recycling Stream	Up to 30%	5 to 10%
Capacity of Waste Container Required		Less than before
Location of Containers	Various locations	Various locations
Cost per year per household	€ 220 (Euros) Cdn \$305 (Cdn)	€ 171 (Euros) Cdn \$238 (Cdn)

Source: *Economia Research and Consulting*. April 2002. **Towards Sustainable Waste Management Practices**

One of the reported drawbacks of the chamber system is the upfront installation and operating costs which are estimated to range from €15 to €90 (Cdn \$21 to \$125) per tonne of waste for installation and from €4 to €15 (Cdn \$5.5 to \$21) per tonne of waste for operating costs.³ However, “according to representative calculations made for different types of chamber systems (using a depreciation of eight years and the common range of waste charges in Germany), break-even was reached after a 9%-19%

³ Jan Reichenbach. March 2, 2005. *Pay as you Throw*. **Waste Management World at** <http://www.earthscan.co.uk/news/article/mps/uan/378/v/5/sp/>

reduction in residual waste for simple chamber systems with a top-lock, and after 23%-38% for more sophisticated systems”.⁴

Variations on the theme include:

PAYT chamber system attached to a compactor



⁴ Jan Reichenbach. March 2, 2005. *Pay as you Throw*. *Waste Management World* at <http://www.earthscan.co.uk/news/article/mps/uan/378/v/5/sp/>

PAYT Chamber System attached to an In-ground (Molox) Container



Both systems charge users based on the weight of the garbage.

Appendix A

Seattle's Container Agreement Form

CONTAINER AGREEMENT

Date: _____

Account No.: _____ Service Address: _____

No. of Units: _____ Containers Svc: _____ No. of Containers: _____ Collections per week: _____

New: _____ Existing: _____ Lid-lockable: _____ Cost of Service: _____

Customer Agreement

We understand and agree that: 1) The service level can be changed at any time (*by the authority of the Solid Waste Utility*) to reflect the actual amount of solid waste produced. 2) Collection rates can be changed to reflect changes in the costs of operations. 3) The service will be for a minimum period of six months; the container(s) must be located on a flat, level, hard surface with unobstructed access to a paved street, alley or parking lot, as approved by a Solid Waste Utility field representative and the collection contractor. 4) The container(s) must be accessible on collection day(s); not blocked or locked up. 5) The customer shall assume responsibility for any damage to paved areas, including driveways, caused by the weight of a collection vehicle, or other damage to property not caused by the negligence or misconduct of the Contractor.

We have read this Container Location Agreement and agree to locate the container as shown. If in the future we want to move the container to another location we will notify the Solid Waste Utility for prior approval.

Please sign and return the office copy as soon as possible so we can order the service requested. If you have questions or problems with your garbage collection, please call 684-7665. If your collection is missed, please call within 24 hours.

Owner Signature: _____ Phone: _____

Agent Signature: _____ Phone: _____

Manager Signature: _____ Phone: _____

Container Location Agreement

The Contractor (General Disposal U.S. Disposal) agrees to provide the service described above, from the location designated below:

Approval Signature: _____ Date: _____

Serial # _____ Collection Days (circle): M T W R F S

Location Diagram:

N
↑
↓
S

City Field Representative: _____

Notes: _____

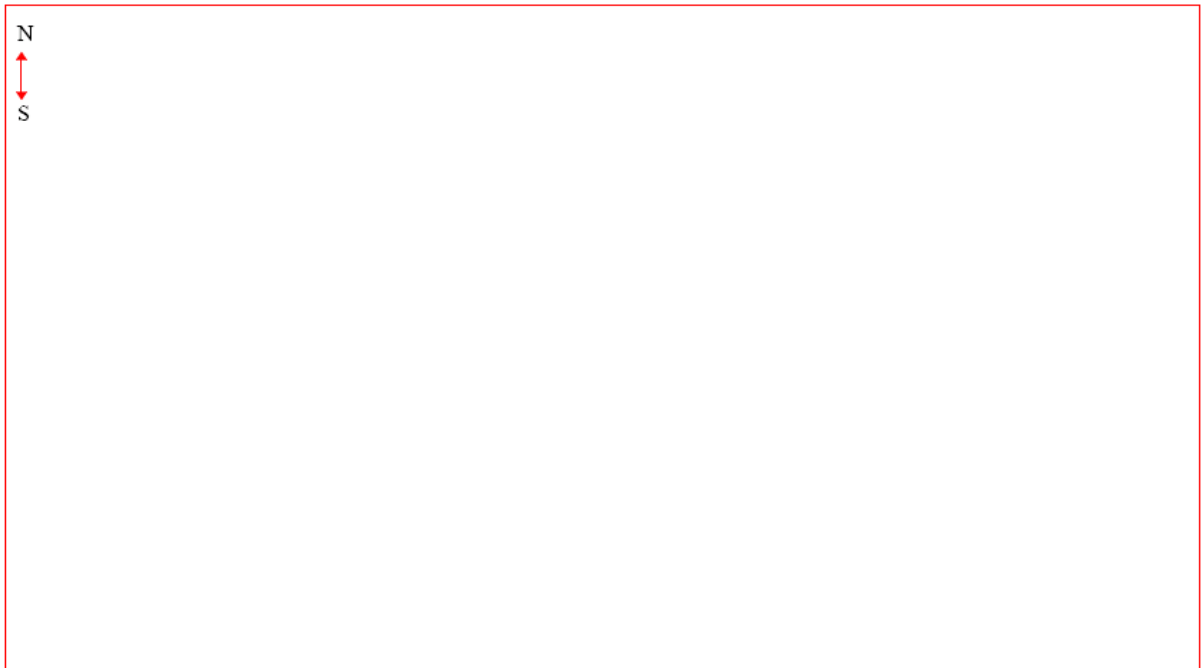
FOR DISAPPROVAL ONLY

Account #: _____

The Contractor (General Disposal U.S.Disposal) disapproves of the City's preferred location for the following reasons:

SUGGESTED LOCATION / SERVICE : _____

Location Diagram:



Contractor representative: _____

Appendix B

Seattle's Uncompacted and Compacted Dumpster Rates

Uncompacted Rates – Effective January 1, 2008							
Rates listed below do not include \$0.65 per household charge							
# of containers	Size (yds)	Number of Pickups per Week					
		1	2	3	4	5	6
1	0.75	\$99.75	\$189.20	\$278.65	\$368.10	\$457.55	\$547.00
1	1	\$112.20	\$214.10	\$316.00	\$417.90	\$519.80	\$621.70
1	1.5	\$137.10	\$263.90	\$390.70	\$517.50	\$644.30	\$771.10
1	2	\$162.00	\$313.70	\$465.40	\$617.10	\$768.80	\$920.50
1	3	\$211.80	\$413.30	\$614.80	\$816.30	\$1,017.80	\$1,219.30
1	4	\$261.60	\$512.90	\$764.20	\$1,015.50	\$1,266.80	\$1,518.10
1	5	\$311.40	\$612.50	\$913.60	\$1,214.70	\$1,515.80	\$1,816.90
1	6	\$361.20	\$712.10	\$1,063.00	\$1,413.90	\$1,764.80	\$2,115.70
1	8	\$460.80	\$911.30	\$1,361.80	\$1,812.30	\$2,262.80	\$2,713.30
1	10	\$560.40	\$1,110.50	\$1,660.60	\$2,210.70	\$2,760.80	\$3,310.90
2	0.75	\$168.85	\$327.40	\$485.95	\$644.50	\$803.05	\$961.60
2	1	\$193.75	\$377.20	\$560.65	\$744.10	\$927.55	\$1,111.00
2	1.5	\$243.55	\$476.80	\$710.05	\$943.30	\$1,176.55	\$1,409.80
2	2	\$293.35	\$576.40	\$859.45	\$1,142.50	\$1,425.55	\$1,708.60
2	3	\$392.95	\$775.60	\$1,158.25	\$1,540.90	\$1,923.55	\$2,306.20
2	4	\$492.55	\$974.80	\$1,457.05	\$1,939.30	\$2,421.55	\$2,903.80
2	5	\$592.15	\$1,174.00	\$1,755.85	\$2,337.70	\$2,919.55	\$3,501.40
2	6	\$691.75	\$1,373.20	\$2,054.65	\$2,736.10	\$3,417.55	\$4,099.00
2	8	\$890.95	\$1,771.60	\$2,652.25	\$3,532.90	\$4,413.55	\$5,294.20
2	10	\$1,090.15	\$2,170.00	\$3,249.85	\$4,329.70	\$5,409.55	\$6,489.40
3	0.75	\$237.95	\$465.60	\$693.25	\$920.90	\$1,148.55	\$1,376.20
3	1	\$275.30	\$540.30	\$805.30	\$1,070.30	\$1,335.30	\$1,600.30
3	1.5	\$350.00	\$689.70	\$1,029.40	\$1,369.10	\$1,708.80	\$2,048.50
3	2	\$424.70	\$839.10	\$1,253.50	\$1,667.90	\$2,082.30	\$2,496.70
3	3	\$574.10	\$1,137.90	\$1,701.70	\$2,265.50	\$2,829.30	\$3,393.10
3	4	\$723.50	\$1,436.70	\$2,149.90	\$2,863.10	\$3,576.30	\$4,289.50
3	5	\$872.90	\$1,735.50	\$2,598.10	\$3,460.70	\$4,323.30	\$5,185.90
3	6	\$1,022.30	\$2,034.30	\$3,046.30	\$4,058.30	\$5,070.30	\$6,082.30
3	8	\$1,321.10	\$2,631.90	\$3,942.70	\$5,253.50	\$6,564.30	\$7,875.10
3	10	\$1,619.90	\$3,229.50	\$4,839.10	\$6,448.70	\$8,058.30	\$9,667.90
4	0.75	\$307.05	\$603.80	\$900.55	\$1,197.30	\$1,494.05	\$1,790.80
4	1	\$356.85	\$703.40	\$1,049.95	\$1,396.50	\$1,743.05	\$2,089.60
4	1.5	\$456.45	\$902.60	\$1,348.75	\$1,794.90	\$2,241.05	\$2,687.20
4	2	\$556.05	\$1,101.80	\$1,647.55	\$2,193.30	\$2,739.05	\$3,284.80
4	3	\$755.25	\$1,500.20	\$2,245.15	\$2,990.10	\$3,735.05	\$4,480.00
4	4	\$954.45	\$1,898.60	\$2,842.75	\$3,786.90	\$4,731.05	\$5,675.20
4	5	\$1,153.65	\$2,297.00	\$3,440.35	\$4,583.70	\$5,727.05	\$6,870.40
4	6	\$1,352.85	\$2,695.40	\$4,037.95	\$5,380.50	\$6,723.05	\$8,065.60
4	8	\$1,751.25	\$3,492.20	\$5,233.15	\$6,974.10	\$8,715.05	\$10,456.00
4	10	\$2,149.65	\$4,289.00	\$6,428.35	\$8,567.70	\$10,707.05	\$12,846.40
5	0.75	\$376.15	\$742.00	\$1,107.85	\$1,473.70	\$1,839.55	\$2,205.40
5	1	\$438.40	\$866.50	\$1,294.60	\$1,722.70	\$2,150.80	\$2,578.90
5	1.5	\$562.90	\$1,115.50	\$1,668.10	\$2,220.70	\$2,773.30	\$3,325.90
5	2	\$687.40	\$1,364.50	\$2,041.60	\$2,718.70	\$3,395.80	\$4,072.90
5	3	\$936.40	\$1,862.50	\$2,788.60	\$3,714.70	\$4,640.80	\$5,566.90
5	4	\$1,185.40	\$2,360.50	\$3,535.60	\$4,710.70	\$5,885.80	\$7,060.90
5	5	\$1,434.40	\$2,858.50	\$4,282.60	\$5,706.70	\$7,130.80	\$8,554.90
5	6	\$1,683.40	\$3,356.50	\$5,029.60	\$6,702.70	\$8,375.80	\$10,048.90
5	8	\$2,181.40	\$4,352.50	\$6,523.60	\$8,694.70	\$10,865.80	\$13,036.90
5	10	\$2,679.40	\$5,348.50	\$8,017.60	\$10,686.70	\$13,355.80	\$16,024.90

Compacted Rates – Effective January 1, 2008							
Rates listed below do not include \$0.65 per household charge							
# of containers	Size (yds)	Number of Pickups per Week					
		1	2	3	4	5	6
1	0.75	\$153.49	\$296.68	\$439.86	\$583.05	\$726.24	\$869.43
1	1	\$183.85	\$357.40	\$530.95	\$704.50	\$878.05	\$1,051.60
1	1.5	\$244.58	\$478.85	\$713.13	\$947.40	\$1,181.68	\$1,415.95
1	2	\$305.30	\$600.30	\$895.30	\$1,190.30	\$1,485.30	\$1,780.30
1	3	\$426.75	\$843.20	\$1,259.65	\$1,676.10	\$2,092.55	\$2,509.00
1	4	\$548.20	\$1,086.10	\$1,624.00	\$2,161.90	\$2,699.80	\$3,237.70
1	5	\$669.65	\$1,329.00	\$1,988.35	\$2,647.70	\$3,307.05	\$3,966.40
1	6	\$791.10	\$1,571.90	\$2,352.70	\$3,133.50	\$3,914.30	\$4,695.10
1	8	\$1,034.00	\$2,057.70	\$3,081.40	\$4,105.10	\$5,128.80	\$6,152.50
1	10	\$1,276.90	\$2,543.50	\$3,810.10	\$5,076.70	\$6,343.30	\$7,609.90
2	0.75	\$276.33	\$542.35	\$808.38	\$1,074.40	\$1,340.43	\$1,606.45
2	1	\$337.05	\$663.80	\$990.55	\$1,317.30	\$1,644.05	\$1,970.80
2	1.5	\$458.50	\$906.70	\$1,354.90	\$1,803.10	\$2,251.30	\$2,699.50
2	2	\$579.95	\$1,149.60	\$1,719.25	\$2,288.90	\$2,858.55	\$3,428.20
2	3	\$822.85	\$1,635.40	\$2,447.95	\$3,260.50	\$4,073.05	\$4,885.60
2	4	\$1,065.75	\$2,121.20	\$3,176.65	\$4,232.10	\$5,287.55	\$6,343.00
2	5	\$1,308.65	\$2,607.00	\$3,905.35	\$5,203.70	\$6,502.05	\$7,800.40
2	6	\$1,551.55	\$3,092.80	\$4,634.05	\$6,175.30	\$7,716.55	\$9,257.80
2	8	\$2,037.35	\$4,064.40	\$6,091.45	\$8,118.50	\$10,145.55	\$12,172.60
2	10	\$2,523.15	\$5,036.00	\$7,548.85	\$10,061.70	\$12,574.55	\$15,087.40
3	0.75	\$399.16	\$788.03	\$1,176.89	\$1,565.75	\$1,954.61	\$2,343.48
3	1	\$490.25	\$970.20	\$1,450.15	\$1,930.10	\$2,410.05	\$2,890.00
3	1.5	\$672.43	\$1,334.55	\$1,996.68	\$2,658.80	\$3,320.93	\$3,983.05
3	2	\$854.60	\$1,698.90	\$2,543.20	\$3,387.50	\$4,231.80	\$5,076.10
3	3	\$1,218.95	\$2,427.60	\$3,636.25	\$4,844.90	\$6,053.55	\$7,262.20
3	4	\$1,583.30	\$3,156.30	\$4,729.30	\$6,302.30	\$7,875.30	\$9,448.30
3	5	\$1,947.65	\$3,885.00	\$5,822.35	\$7,759.70	\$9,697.05	\$11,634.40
3	6	\$2,312.00	\$4,613.70	\$6,915.40	\$9,217.10	\$11,518.80	\$13,820.50
3	8	\$3,040.70	\$6,071.10	\$9,101.50	\$12,131.90	\$15,162.30	\$18,192.70
3	10	\$3,769.40	\$7,528.50	\$11,287.60	\$15,046.70	\$18,805.80	\$22,564.90
4	0.75	\$522.00	\$1,033.70	\$1,545.40	\$2,057.10	\$2,568.80	\$3,080.50
4	1	\$643.45	\$1,276.60	\$1,909.75	\$2,542.90	\$3,176.05	\$3,809.20
4	1.5	\$886.35	\$1,762.40	\$2,638.45	\$3,514.50	\$4,390.55	\$5,266.60
4	2	\$1,129.25	\$2,248.20	\$3,367.15	\$4,486.10	\$5,605.05	\$6,724.00
4	3	\$1,615.05	\$3,219.80	\$4,824.55	\$6,429.30	\$8,034.05	\$9,638.80
4	4	\$2,100.85	\$4,191.40	\$6,281.95	\$8,372.50	\$10,463.05	\$12,553.60
4	5	\$2,586.65	\$5,163.00	\$7,739.35	\$10,315.70	\$12,892.05	\$15,468.40
4	6	\$3,072.45	\$6,134.60	\$9,196.75	\$12,258.90	\$15,321.05	\$18,383.20
4	8	\$4,044.05	\$8,077.80	\$12,111.55	\$16,145.30	\$20,179.05	\$24,212.80
4	10	\$5,015.65	\$10,021.00	\$15,026.35	\$20,031.70	\$25,037.05	\$30,042.40
5	0.75	\$644.84	\$1,279.38	\$1,913.91	\$2,548.45	\$3,182.99	\$3,817.53
5	1	\$796.65	\$1,583.00	\$2,369.35	\$3,155.70	\$3,942.05	\$4,728.40
5	1.5	\$1,100.28	\$2,190.25	\$3,280.23	\$4,370.20	\$5,460.18	\$6,550.15
5	2	\$1,403.90	\$2,797.50	\$4,191.10	\$5,584.70	\$6,978.30	\$8,371.90
5	3	\$2,011.15	\$4,012.00	\$6,012.85	\$8,013.70	\$10,014.55	\$12,015.40
5	4	\$2,618.40	\$5,226.50	\$7,834.60	\$10,442.70	\$13,050.80	\$15,658.90
5	5	\$3,225.65	\$6,441.00	\$9,656.35	\$12,871.70	\$16,087.05	\$19,302.40
5	6	\$3,832.90	\$7,655.50	\$11,478.10	\$15,300.70	\$19,123.30	\$22,945.90
5	8	\$5,047.40	\$10,084.50	\$15,121.60	\$20,158.70	\$25,195.80	\$30,232.90
5	10	\$6,261.90	\$12,513.50	\$18,765.10	\$25,016.70	\$31,268.30	\$37,519.90