

The Monthly UnEconomist

Garbometric Model 1 - Garbage Collection Rate Design Based on Contractor Fees

Garbometric Model 1 is a Microsoft Excel workbook for designing and calculating garbage collection rates for single-family residential can/cart, commercial (including multi-family) can/cart/detachable container, and commercial (including multi-family) rolloff drop box/compactor service sectors. The workbook contains seven spreadsheets to assist the user in organizing input data and reviewing output garbage rates.

The model's user enters:

- Contractor collection and disposal fees for each service level in each service sector for the current year.
- Budget line items for the collection contract's administrative agency for the current year.
- Current year tipping fee, as well as projected tipping fees for the next two years.
- Projected escalator values for the contractor's collection fees for the next two years.
- Projected escalator values for the administrative budget for the next two years.
- Projected service sector customer growth rates for the next two years.
- Current year garbage collection rates for each service level.

The model's user also selects the desired rate design from the following design options:

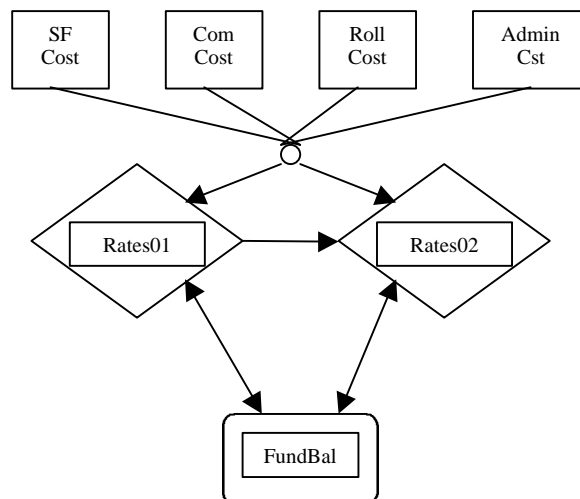
- Contractor fees.
- Garbage container size.
- Uniform by customer.
- Uniform by customer service units.
- Current year (also called "last year" on the spreadsheet that calculates rates for "next year") rate structure.
- Any linear combination of the above five rate designs.

Based on these input data, the model computes garbage rates for each service level in each sector for the subsequent two years. The model

allows for the inclusion of single-family recycling and/or yard debris collection costs in the contractor's garbage collection fee, or in the administrative agency's budget.

The following flow diagram shows the basic connections between the seven spreadsheets - SFCost, ComCost, RollCost, AdminCost, Rates01, Rates02, and FundBal. Each spreadsheet is described below in a separate section.

Rate Design Model Flow Diagram



Single Family Can/Cart Garbage Collection & Disposal Fees (SFCost)

The single family cost spreadsheet (SFCost) gathers user input data on single family customer counts and collection & disposal fees for the current year. User input data in the SFCost spreadsheet, as well as in the other six spreadsheets in the model, are indicated via dot-shading of cells where the user should enter the appropriate information. Unshaded cells contain formulas and/or model parameters that should not be overwritten.

As shown on SFCost, the user supplies:

- Single family customer counts for each service level for the current year.
- Contractor garbage collection and disposal fees for the current year.
- Year dates (2000, 2001 and 2002 in the model provided on our ZeroWaste.com website).

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- Expected contractor collection cost escalators (shown under the heading CPI Increase on SFCost), with an assumption built into the model that contractor collection fees increase at 80% of a given year's cost escalator.
- Garbage customer count, recycling and yard debris growth rates for the subsequent two years.
- Expected current year collection tonnage.

In the data shown in the model provided at ZeroWaste.com, the contractor's service fee for collecting waste includes costs for weekly recycling and yard debris collections, in addition to weekly collection of the garbage volume indicated by the size garbage container used with each service level.

The contractor's disposal fee for each service level is calculated from contractor supplied assumptions about the weight of garbage collected from each size garbage container at each pickup, and the per ton disposal fee (entered under the heading Solid Waste Tip Fee) for the current and two subsequent years.

Given these user supplied input data, the SFCost spreadsheet calculates collection and disposal fees for each service level, as well as in total, for the residential single family service sector for the subsequent two years. For example, fees for 2001 are shown in the columns labeled "2001 Disposal Fee Per Pickup", "2001 Service Fee Per Pickup", and "2001 Contract Rate Per Month" on the SFCost spreadsheet. The SFCost spreadsheet inputs this fee data for the two subsequent years into the Rates01 and Rates02 spreadsheets, respectively.

SFCost calculates expected garbage, recycling and yard debris tonnage for the subsequent two years based on user supplied estimates of tonnage in the current year and customer growth rates. As a cross check on garbage disposal tonnage, the SFCost spreadsheet also calculates expected garbage disposal tons based on the contractor supplied estimates of the weight of garbage typically collected from each size garbage container. If the user projected garbage tons for

the three years differ substantially from the contractor's expected garbage tonnage, the user then knows to check their tonnage projections and/or the contractor's container garbage weight assumptions.

Commercial (including Multi-Family) Can/Cart/Detachable Container Garbage Collection & Disposal Fees (ComCost)

Contractor fees for collection and disposal of garbage from commercial cans, carts and detachable containers (typically serviced by front-load garbage collection trucks) are shown on the spreadsheet ComCost. The basic structure of ComCost is identical to SFCost, except that year dates, tipping fees, and inflation factors are based on user inputs supplied for SFCost to assure model data consistency.

As for SFCost, dot-shading indicates user input cells on ComCost. Unshaded cells contain model formulas and parameters that should not be overwritten by users.

Based on user inputs for current year can/cart/container counts, container count growth rates for the subsequent two years, current year collection service fees, and assumed garbage weights (including compaction ratio for front load compactors), ComCost computes contractor collection and disposal fees by service level and in total for two subsequent years. ComCost also provides a cross check on user estimated disposal tonnage versus tonnage covered by the disposal fee component of contractor charges.

Commercial (including Multi-Family) Drop Box and Compactor Service Fees (Roll-Cost)

The rolloff service sector spreadsheet (Roll-Cost) gathers in dot-shaded cells the user's input data on current year monthly pickups (hauls) for drop boxes and compactors, current year rental container counts for drop boxes, pickup and container rental growth rates for the subsequent two years, and compaction ratio for rolloff compactors.

Drop boxes and compactors are hauled one at a time to the transfer/disposal site. As a result,

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disposal fees can be charged directly (passed through) to the customer, and the contractor does not need to estimate garbage weights by container type as is required for the residential can/cart and commercial can/cart/container sectors.

As with ComCost, RollCost year dates, tipping fees and inflation rates are determined by user entries in SFCost to assure model consistency.

Based on all these user inputs, RollCost computes contractor hauling and rental fees for the subsequent two years and in total for drop boxes and compactors in each of the three years covered by the model.

General Operations and Administration Costs (AdminCst)

The AdminCst spreadsheet gathers user inputs on the current year budget, by line item, for the agency supervising the garbage collection contractor. In the data supplied with the model on our website ZeroWaste.com, the budget includes costs for customer billing. For the situation in which the contractor bills customers directly, and thus includes billing costs in the collection fees for each service level, the user can set billing costs to zero in AdminCst.

Unlike ComCost and RollCost, the inflation rates for AdminCst are not fixed at the level specified on SFCost. This allows the administration budget to inflate at a different rate than the garbage collection contractor's collection service fees. Thus the user must supply inflation rates for the administration budget, as well as indicating what portion of the overall inflation rate should be applied to each line item.

Garbage Collection and Disposal Rates for Next Year (Rates01)

The spreadsheet Rates01 uses contractor fees and budget costs from SFCost, ComCost, RollCost and AdminCst to calculate garbage collection charges for next year (2001 in the version available at ZeroWaste.com). User input data required for Rates01 are, as follows:

- Tax rates.

- Percentages for allocating administrative costs to the various service sectors (single family garbage, single family recycling, single family yard debris, commercial garbage, multi-family recycling, and rolloff garbage).
- Yes/No choice as to whether single family recycling and/or yard debris collection costs, associated with the percentage allocation of administrative costs described above, are to be spread across all residential and commercial garbage collection customers or not. (This choice is more important when, for example, recycling costs are not included in the garbage contractor's service fees because, say, the recycling and/or yard debris hauler is not the same as the garbage hauler. In that case these costs could be entered through the AdminCst spreadsheet, or the user might want to use a different version of this rate design model soon to be available at our website.)
- Current year garbage collection rates (shown under the heading 2000 OurTown Rates and identified as "LAST YEAR" in the rate design choices on the model available at our website).
- Year dates for year indicators included along with text in certain row/column headings.

The user must also select their choice for rate design by entering numbers between 0 and 100 in cells P32 through T32. The entries must sum (the sum is shown in cell U32), and a message in cell V32 prompts the user to change the entries if they do not sum to 100.

Rate design choices are:

- Contractor Fees: garbage collection rates charged for each service level are based on contractor fees for each service level.
- Garbage Can/Cart/Detachable Container/Rolloff Capacity: garbage collection rates for each service level are basically proportional to weekly garbage container capacity for each service level.
- Customer/Service Units: garbage collection rates for each service level are based on a

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disposal charge that is proportional to garbage container capacity for residential and commercial service sectors. There is no disposal charge for the rolloff service sector, because rolloff disposal fees are "passed through" directly to the customer". To the disposal charge is added a uniform collection service charge for each single family household customer or, in the commercial and rolloff service sectors, a uniform collection service charge for each garbage container.

- Service Units: garbage collection rates for each service level are the same as in the Customer/Service Unit rate design, except that the collection service fee for the single family service sector is based on a uniform charge for each garbage container, rather than a uniform charge for each household.
- Last Year: garbage collection rates for each service level are calculated as a uniform percentage increase/decrease versus current year rates (which next year become "last year's" rates). The increase/decrease is based on the percent by which total contractor fees and administrative costs have changed. Except that the percentage applied to the rolloff sector is different than the percentage applied to the single family residential and commercial sectors whenever next year's tipping fee differs from the current year tip fee.

The user selects a rate design by entering 100 in one of the five cells P32 through T32. Or the user can select a combination rate design by entering values in more than one of these cells, as long as the entries sum to 100.

The combination rate design is useful, for example, in the case of a current year rate structure that contains a cross-subsidization, say, of single family residential customers by commercial and rolloff customers. There might be too much "rate shock" as a result of moving from the current year cross-subsidized structure to one of the four rate designs that assume costs for each of the three sectors are entirely paid by garbage rates charged to customers in each respective

sector. By balancing the rate design between one of the non-cross-subsidized structures and the current subsidized structure, the user can mitigate "rate shock" by eliminating the cross-subsidy over several years instead of all at once.

Garbage Collection and Disposal Rates for Two Years Hence (Rates02)

The spreadsheet Rates02 has a structure identical to Rates01, except that rates for "last year" on Rates02 are now input from rates calculated on Rates01 instead of being input by the user based on current year rates. Once the user enters the appropriate data and rate design parameter choices as described above for Rates01, the Rates02 spreadsheet calculates rates for each service level for the second year subsequent to the current year.

Solid Waste Fund Balance (FundBal)

The seventh spreadsheet in Garbometric Model 1 is FundBal. This spreadsheet is for users that report and track solid waste revenues and expenditures through a separate account or fund - for example, when the administrative agency is operated as a solid waste utility. FundBal provides a summary of projected fund balance increases or decreases over the subsequent two years.

The user enters expected fund revenues and expenditures for the current year, current beginning fund balance, and totals for special transactions such as grant revenue in the two subsequent years. Contractor fees and budget expenditures projected in the two subsequent years from SFCost, ComCost, RollCost and AdminCst; revenues from customer garbage rate charges calculated on Rates01 and Rates02; and tax liabilities calculated on Rates01 and Rates02 then feed into FundBal to calculate solid waste fund total revenues, expenditures and end-of-year balances for these two years.

As shown in the Rate Design Model Flow Diagram on page 1 above, FundBal also feeds data back to Rates01 and Rates02. This is because the rate design model allows the user to accrue funds for future year rate stabilization

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and/or for debt service or major capital outlays. Examples of the latter might include debt service on past purchases of garbage or yard debris carts or recycling containers, or landfill closure costs.

To invoke the use of the FundBal spreadsheet for one or more of these purposes, the user enters dollar totals in the appropriate line item rows at the bottom of FundBal. These totals then feed into the revenue requirement computations on Rates01 and/or Rates02 that are used in calculating rates for the two subsequent years, causing the rates to be increased to cover the desired accrual of additional revenue from garbage ratepayers.

About The Monthly UnEconomist

This monthly online newsletter available at www.ZeroWaste.com (or www.SoundResource.com) intends to provide insight and analysis on the everyday economics of recycling and the unpriced or underpriced environmental benefits of reducing waste disposal and replacing virgin-content products with products manufactured from recycled materials. In addition to *The Monthly UnEconomist*, Sound Resource Management's website ZeroWaste.com also offers recycling markets price history graphs, reports on a variety of topics including the economic and environmental benefits of recycling, and GarboMetrics - elegant, yet not mysterious tools and spreadsheet models for solid waste and recycling.

These materials are all available for no charge at www.ZeroWaste.com. User feedback is encouraged via info@ZeroWaste.com, and substantive comments will be published in our newsletter whenever they add to our understanding of recycling.

As an example of newsletter content, some issues of the *UnEconomist* analyze northwestern and northeastern U.S recycling market prices for nine recycled materials (mixed paper, ONP, OCC, glass containers, tin cans, UBC, PET bottles, HDPE natural bottles, and HDPE colored bottles). These prices are tracked by online graphs updated quarterly.

In addition, some issues of the *UnEconomist* are devoted to GarboMetrics, economic models for managing and analyzing solid waste and recycling. These newsletter issues explain the structure and use of GarboMetric models provided at ZeroWaste.com for such purposes as designing garbage customer rate structures and correctly comparing garbage rates in different communities. GarboMetric models and corresponding issues of *The Monthly UnEconomist* can be downloaded at no charge from www.ZeroWaste.com.