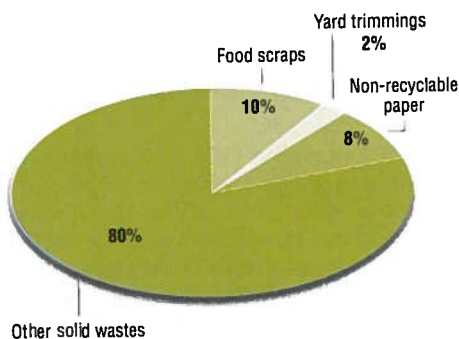


ASSESSING RESIDENTIAL COLLECTION OF SOURCE SEPARATED ORGANICS

Figure 1. Composition of organics disposed in Georgia MSW, 2005 (percent by weight)



THE State of Georgia has strategically invested in diversion tools and facilities based on the outcome of a statewide waste characterization study conducted in 2005 by Science Applications International Corporation (SAIC). First the state reestablished its reduction goals for the most prevalent recyclables and invested in single-stream recycling hubs to facilitate collection and processing of paper, glass, plastic and metal. Next in line is the organics fraction. According to the statewide characterization study, an estimated 1.7 million tons of organics, including food scraps, yard trimmings and non-recyclable paper, are being disposed in Georgia landfills each year (Figure 1).

Funded by a grant from Region 4 of the U.S. Environmental Protection Agency, the Georgia Department of Community Affairs and the Georgia Recycling Coalition commissioned SAIC to develop tools to assist local governments and other users with evaluating the feasibility of a residential source separated organics (SSO) collection program in their community. First the project team developed a model that would walk local govern-

New model from State of Georgia guides solid waste officials through a series of decisions related to implementing a residential SSO program. A tool kit is also available for communities moving forward with a program.

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ments and other users through decisions related to collecting organics from residents and estimating the operational, diversion, financial and greenhouse gas (GHG) impacts resulting from implementing a residential SSO collection program. Next, the project team provided tools to assist local governments that elect to move forward with implementing a residential SSO collection program.

In late 2011, the State of Georgia released the Source Separated Organics Collection Performance Model (the Model) and the Residential Source Separated Organics Collection Tool Kit (Tool Kit).

SSO COLLECTION PERFORMANCE MODEL

The SSO Collection Performance Model is developed in a Microsoft Excel® format. The model guides the user through a series of screens to provide information about current solid waste management practices and about the design of a potential residential SSO collection program, including impacts on other programs such as refuse and yard trimmings. The model requests key information from the user, including:

- Number of households to have access to the SSO collection program;
- Frequency of collection and the type of collection vehicles to be used;
- Types of organic materials to be collected;
- Amount and composition of MSW disposed;
- Projected participation and capture rate;
- Collection entity (municipal or private) and households served per route;
- Distance to and tipping fee at processing facility; and
- Likely revenues from sale of product.

The model provides access to default values for most of these fields based on actual data available. Users with more site-specific information can enter

Figure 2. Screen shot of SSO Collection Performance Model

		Composition of MSW Disposed Statewide ¹	Composition of Materials Targeted by SSO Program Disposed by Community	Tons Disposed per Year in Community	Pounds per Collection for Households with Access ²
FoodScraps ³	Fruits, Vegetables, and Bakery	7.5%	7.5%	398	1.5
	Other Food Scraps	5.9%		-	-
Non-Recyclable Paper	Non-Recyclable Paper	10.7%	10.7%	567	2.2
Other Organics	Yard Trimmings ⁴	2.1%	2.1%	111	0.4
	Wood (non-C&D)	1.4%		-	-
	Other Organics	1.3%		-	-
Subtotal Organics Disposed		28.9%	20.3%	1,076	4.1
Other Refuse Disposed		71.1%	79.7%	4,224	16
Total Refuse Disposed		100.0%	100.0%	5,300	20.4

their own data specific to their planned program. For example, the model asks for an estimate of tons of organic materials to be collected. The default tonnage for these materials applies the Georgia statewide results from the 2005 composition study to the total tonnage disposed in that community. However, users can override the default values and insert their own composition data if available. Offering the option of accepting default assumptions in the model or entering site-specific input results in a tool that is valuable for both the user with limited knowledge of how a SSO collection program may operate in their community and for the most sophisticated user.

The output of the model provides information regarding the proposed residential SSO program, including: Estimated tonnage available; Projected tonnage of each material collected; Estimated cost; Estimated revenues/savings; Estimated cost per household; and Net impact on greenhouse gas emissions. In addition to using the SSO Collection Performance Model to estimate the impact of a particular program, it can be used to compare the performance of multiple residential SSO collection program designs and thus help communities decide which one best achieves their goals and objectives.

As part of the model development, SAIC worked with three communities across the state of Georgia to use the tool to determine the diversion, financial and other impacts of a "hypothetical" SSO collection program. The three test case examples include the following programs:

Example #1: Weekly curbside SSO collection program for all of the 10,000 households in the community. Accepts fruits, vegetables and bakery; yard trimmings (that are currently collected separately), and nonrecyclable paper. Municipality receives some revenue from sale of compost.

Example #2: Weekly curbside SSO collection program for 5,500 households. Accepts all food scraps and non-recyclable paper. Yard trimmings are

and will continue to be collected separately. Processor retains revenues from sale of product.

Example #3: A drop-off program for all food scraps, yard trimmings, and other organics (excluding wood) at a network of 19 existing centers in a County with a population of 16,000.

Table 1 shows calculations for Current Practices. Table 2 contains the assumptions. Table 3 provides results for each of these residential SSO collection programs. The tables are based on responses from communities and changed slightly for purposes of the article. The model does take into account the reduction in refuse tonnage, fuel, vehicles and personnel due to imple-

Table 1. Test case examples: Current practices

	Example #1	Example #2	Example #3
Current Waste Management Practices			
Tons/yr refuse collected for disposal	5,300	4,400	16,000
Tons/yr yard trimmings collected separately	1,800	2,160	NA
Tip fee at refuse disposal location (\$/ton)	28	34	35.97
Tip fee at SSO delivery location (\$/ton)	18	7.50	10
RT ¹ mileage to refuse disposal location	12	10	NA
RT mileage to yard trimmings delivery point	12	NA	NA
RT mileage to SSO processing facility	12	20	NA
Program Description			
Materials accepted	Fruits, vegetables, bakery, other food scraps, yard trimmings, and non-recyclable paper	All food scraps and non-recyclable paper	All food scraps, yard trimmings, non-recyclable paper, and other organics (excluding wood)
Frequency of collection	Weekly	Weekly	Drop-off center requiring 72 pulls per year
Vehicle type	Rear-loader with tippers	Rear-loader with tippers	Roll-off

¹RT= round trip

Table 2. Test case examples: Assumptions

	Example #1	Example #2	Example #3
Assumptions - Performance			
Participation rate, yard trimmings (%)	80	NA	NA
Capture rate, yard trimmings (%)	95	NA	NA
Participation rate, all other accepted materials (%)	70	50	NA
Capture rate, all other accepted materials (%)	75	65	NA
Assumptions - Operational			
Routes required	9	4	NA
# of new employees (full-time equivalents)	3	3	1
New vehicles	1	1	0
Other new equipment	11,000 carts	6,050 carts	19 dumpsters
Reduction in refuse loads	1	1	0
Reduction in yard trimmings routes	4	0 (still collected separately)	0
Assumptions - Financial			
Annual revenue for product sold (\$)	2,750 ¹	0	280 ²
Annual savings for product that was not purchased because compost used instead (\$)	100	0	NA

¹Based on \$10 for 275 units sold. ²Based on \$5 for 56 units sold

Table 3. Test case examples: Results

	Example #1	Example #2	Example #3
Results - Tonnage			
Additional tons/yr targeted	2,876	1,060	1,391
Additional tons/yr diverted	1,933	345	417 with 30% recovery
Units of product sold to market	275	0	56
Units of product not purchased because replaced by product	0	0	0
Results - Financial			
Annual personnel costs (\$)	94,000	94,000	34,000
Annual equipment costs ¹ (\$)	75,500	51,775	950
Annual operation & maintenance costs (\$)	20,000	20,000	0
Annual change in fuel costs ² (\$)	3,900	31,200	19,200
Annual processing costs ³ (\$)	34,791	2,585	4,172
Total annual costs (\$)	228,191	199,560	58,322
Annual avoided disposal costs (\$)	54,120	51,127	15,008
Other revenues and savings (\$)	2,750	0	280
Total annual revenue/savings (\$)	56,970	11,717	15,288
Net annual costs (savings) (\$)	171,221	187,843	43,034
Average cost (savings) per household per month (\$)	1.43	2.85	0.22

¹The Model allows users to assume an interest rate and a depreciation term. The amount identified for all examples are based on a 0% interest (cash purchase) over 10 years. ²Fuel costs are higher in Example 2 because yard trimmings will continue to be collected separately. ³Processing costs are higher in Example 1 because the processing fee is \$18/ton for 1,933 tons versus in Example 2 the processing fee is \$7.50/ton for 345 tons.

mentation of a SSO program. For example, it calculates the estimated number of refuse loads to be eliminated by implementation of an SSO program allowing the user to calculate the reduction in fuel costs. In addition, the model requests the user to identify the net impact in equipment and personnel based on existing refuse equipment and personnel being transitioned and utilized in the SSO program.

RESIDENTIAL SSO COLLECTION TOOL KIT

Accompanying the Model, the Tool Kit assists local governments with implementing a residential SSO program. For example, the Tool Kit contains a detailed 18-month implementation strategy. Included are a schedule, responsible party and stakeholders for each action item, and estimated cost. The action items are divided into four phases: program planning, pilot program (should the community choose to start with a pilot), community-wide implementation and post-implementation.

The Tool Kit also contains examples of materials that can be used to gather input and information about the program. A sample prepilot survey of residents is designed to determine how much food waste may be generated by households in the pilot area, the likelihood that residents will participate in a SSO collection program, and for those that are likely to participate, the type of organic material they would separate for collection. The survey also elicits concerns about organics separation and potential ways to address them. A

sample post-pilot survey is included to determine why residents chose to participate or not to participate, their de-

gree of satisfaction with the program, and what could be improved before the SSO program is expanded.

Next, the Tool Kit includes sample public education and information materials that could be printed and distributed or posted online, including a fact sheet and letters to residents introducing both pilot and community-wide programs. The Tool Kit also includes reporting documents for haulers of organics, recyclables and solid waste; descriptions, examples of and links to information regarding containers and vehicles; links to information regarding organics processing facilities in EPA Region 4; and more detailed waste composition data than that provided in the model alone.

For more information on the Source Separated Organics Collection Performance Model or the Residential Source Separated Organics Collection Tool Kit, contact the Georgia Department of Community Affairs at <http://www.dca.ga.gov/> or the Georgia Recycling Coalition at <http://www.georgiarecycles.org/>.

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