

Appendix B



Appendix B

Tip Fees, SBC, and Impact Fee Revenue Sources

Introduction

The purpose of this Appendix is to provide a summary on how tip fees, system benefit charges (SBCs), and solid waste impact fees may be structured to meet Carroll County's solid waste system revenue requirements. Attached to this Appendix are series of exhibits that show the basis of our estimates. Results have been shown assuming both 100% County Waste to System, and also under the Current Waste Stream Received at County scenario. Note that tip fees themselves will remain the same under each scenario, but tip fee revenues in the former scenario will be significantly greater than the latter scenario because of the increase in tons crossing County scales. Reduced tip fee revenues will necessarily drive up the SBCs needed to break even.

System Benefits Charge Calculations

Development of the likely SBC rates involves compiling revenue needs, customer counts, and defensible generation rates. The following exhibits provide an outline of the development of such fees based on available Carroll County data.

Exhibit A – Projected FY06 Revenue Requirements: This exhibit summarizes the projected solid waste system operating and maintenance costs plus debt service requirements for FY06 for both scenarios. As shown, if the County manages all waste generated in the County, the revenue requirement is \$14.5 million to achieve system sufficiency, but only \$12.1 million if the County continues to manage only the current quantity of wastes. This difference in cost is driven by the variable costs of transferring incremental wastes through the County's transfer capability.

Exhibit B – Services Provided: This exhibit summarizes the services provided by (or major cost centers within) the County's solid waste management system, and introduces the concept of single family residential, multi-family residential, and commercial/institutional/industrial (non-residential) customer classes. Numerous generation studies have shown that waste generation differs significantly by customer class, and also within the non-residential customer class. Therefore, any SBC charged to a particular customer class will need to take into consideration both the services that benefit that customer class, as well as the applicable generation rate that may be used to set the SBC.

This exhibit also summarizes which waste generating sectors are being managed within the County's infrastructure by municipality. It is important to note that the County would need to validate this information in formulating an SBC to assure that

the SBC equitably charges customers both within and outside of incorporated areas for the services (or system benefits) received.

Exhibit C-1 – Projected Tip Fee Billing Units (Tons): As shown in this exhibit, there are approximately 187,000 tons of various types of wastes being generated in the County’s system, although the County is only managing 132,000 tons currently. The County-wide data were derived from the MDE Solid Waste Tonnage reports for County disposal/transfer facilities, and also from the MRA Tonnage Reporting System, while the current County-managed tons were projected based on data provided by the County.

Exhibit C-2 – Project SBC Billing Units: Unlike a tip fee, an SBC charges customers directly for the benefits they receive by having access to the Carroll County solid waste system. It is therefore necessary to develop meaningful billing determinants for each customer class. For single family and multi-family residential customers, SBCs are typically applied to each dwelling unit. This implies a flat rate for each single family detached household, and a separate (and usually lower) flat rate for each multi-family dwelling unit¹. As shown, there are believed to be roughly 46,000 single family and 7,000 multi-family dwelling units in the County.

The non-residential sector poses additional challenges because of the wide variability of business types and business sizes. A small grocery store will generate less waste than a large grocery store, for instance, and a retail store will have different generation patterns than a restaurant. Commercial SBCs therefore need to take into account this variability. For the purposes of this analysis, we have set the commercial SBC based on the number of increments of 2,000 square feet of developed property, and further applied a five tiered breakdown of generation levels (from Low to High). This system is in use in Montgomery County, MD, and was recently adopted in Frederick County, MD.

Note that other counties use other methods to estimate commercial generation rates, if possible by relying on actual dumpster size and frequency to calculate generation rates. This latter system is in place in Brevard County, FL. As shown in the exhibit, there are approximately 33 million developed square feet of non-residential establishments in the County. This estimate has been prepared absent a detailed review of the County’s property tax database. If an SBC were ultimately to be pursued, it would be necessary to utilize (or possibly develop from scratch) the property tax database (or other existing database containing detailed commercial property data) showing developed square footage, or else to establish permit, franchise or hauler requirements for reporting of actual service levels provided to businesses in Carroll County.

Exhibit D – Generation Projections: Ideally, sufficient information will be available to the County to develop accurate generation rates for single family, multi-family, and non-residential customer classes separately. Such information can be developed based on landfill scale data, hauler reports, and/or statistically defensible field observations, to name the most common approaches. If infrastructure for multiple materials are to

¹ For multi-family apartments with central management, the SBC is calculated by multiplying the per-dwelling unit SBC by the number of dwelling units in the entire building.

be covered by the SBC (for example, refuse, yard waste and recyclables), then it is preferable to develop separate generation rates by customer class for each material, as this will provide the most supportable basis for the SBC.

Based on the analysis shown, Carroll County's residential sector is generating 69 percent of the total waste in the County, with the non-residential sector generating the remaining 31 percent. Based on the generation rates shown, the total waste generated in the County is estimated to be 149,000 tons.

The generation rates shown in the exhibit, although loosely based on Montgomery County (MD) generation rates, cannot be certain to be reflective of Carroll County waste generation patterns. The 149,000 tons calculated in this exhibit is roughly in line with the quantities currently managed by the County, but appears to be well below the total county-wide waste generation estimates. If the County proceeds with establishment of an SBC, it will be necessary to perform a more complete waste generation analysis to refine the County's true generation rates or else validate that generation rates developed in a nearby county (such as Montgomery) may be applicable to Carroll.

Exhibit E-1 – SBC Revenue Summary, 100% County Waste to System: The County currently charges \$54 per ton for refuse and \$15 per ton for yard waste. If the County were to manage all wastes generated in the County, as shown in this exhibit, tip fees would account for \$9.9 million dollars in revenues. The average single family household would pay approximately \$75 annually to fund solid waste infrastructure.

Exhibit E-2 – SBC Revenue Summary, Current Waste Stream Received at County: If the County continues receiving the current level of wastes, then the total tip fee revenues will be roughly \$6.9 million. However, the “gap” between tip fee revenues and total revenue needs is comparable to the 100% County Waste to System scenario, resulting in an SBC to single family households of \$81 annually.

In both scenarios, the SBC is used to recoup the revenue shortfall needed to fund solid waste management in Carroll County. To be conservative, we have applied a five percent contingency to the system revenue requirements, all of which is recouped by the SBC. Note that a variety of factors—such as lower tip fees, unforeseen system cost increases, a smaller customer base than the one used for this analysis—would have the effect of increasing the SBC.

Solid Waste Impact Fees

Development impact fees are widely used for a range of infrastructure, and have been applied to parks, schools, fire stations, water/sewer, and electric, to name a few. Impact fees, including for solid waste, are legislatively enabled in Carroll County. There are two methods for developing impact fees that have been applied successfully.

The *Equity Buy-In Method* is based on the premise that new customers are entitled to service at the same prices charged to existing customers. Thus, new customers connecting to the utility should be required to pay an amount equal to that which has been paid by existing customers. In calculating the fee under this methodology,

adjustments to recorded plant costs are made to recognize depreciation, customer contributed capital, and outstanding debt to be eventually recovered through rates.

The *Incremental Cost Method* is based on the premise that when a new customer connects to the utility, this customer will reduce existing reserve capacity, which capacity will have to be eventually replaced or will require the construction of new capacity. The use "of the incremental cost methodology attempts to eliminate or minimize the portion of future rate increases due by growth by reducing the utility's new investment to a point, which revenue from new customers under existing rates can support the actual new investment that the utility makes for new customers."²

There is limited literature on the subject of solid waste impact fees, and very few jurisdictions have actually implemented such fees. The City of Phoenix and several counties within Florida are among the relatively small population of jurisdictions that have implemented such fees, and have applied the incremental cost method. We have attempted to estimate the likely solid waste impact fee under both methods to compare and contrast the two.

Exhibit F-1 – Solid Waste Impact Fee, Equity Buy-in Method: This exhibit illustrates the likely impact fee were the Equity Buy-in method to be used. As shown, existing customer solid waste system equity is calculated from balance sheet line items showing land and buildings net of depreciation, landfill closure/post-closure obligations, and nets out the remaining principal on bonds payable.

Based on this exercise (using data from the County's 2004 CAFR), it is estimated that the solid waste impact fee would be in the range of \$108 for new single family homes, with varying amounts for the multi-family and commercial customer classes.

Exhibit F-2 – Solid Waste Impact Fee, Incremental Method: This exhibit illustrates the likely impact fee were the Incremental method to be used. For purposes of the example, we have used the alternative technology option of building a 600 tpd waste-to-energy (WTE) facility as the basis for this example. As shown in the Carroll County Solid Waste Management Options draft report, a 600 tpd WTE is anticipated to require approximately \$167 million in capital investment in 2012. This facility is designed to accommodate the current (2005) customer base plus incremental growth in the residential and commercial customer base between now and 2012. As shown, roughly 9,000 incremental residential households and another 2,800 commercial billing units (5.7 million square feet of commercial development) are expected to come online in the County in the ensuing years.

These new customers are further projected to generate incremental waste. Assuming 26,000 incremental tons of waste generated, the new growth will be responsible for approximately 14.6 percent of total waste generation for waste entering the new facility compared to today's levels. The same fraction is used to estimate the net present value capital costs attributable to new customers, which is found to be approximately \$18 million.

Finally, solid waste impact fees are established by apportioning total costs attributable to incremental growth over the incremental waste generation from the new customer

² AWWA Manual M26, p. 15.

base. As shown, this methodology results in single family solid waste impact fees of almost \$1,500 per household. Note that the rates shown are simplified, and we have not attempted to calculate any credits that may ultimately offset these rates. Credits have been calculated in other studies to account for the estimated amount of future capital improvements funded from operating revenues which would be collected from all customers.

Although the incremental method has been implemented successfully in the development of a small number of solid waste system impact fees nationally, it is likely that such method would pose considerable challenges in Carroll County, both because of the complexity of calculating the fee and because of the size of the resulting fee. The equity buy-in method, we believe, is both more easily defensible from a methodological standpoint, and also less onerous to the building community by virtue of the significantly lower rates. However, we are only aware of the use of such method to fund water/sewer system expansions, and have not identified its use in solid waste fee development.

EXHIBIT A
CARROLL COUNTY, MARYLAND
SOLID WASTE MANAGEMENT
PROJECTED REVENUE REQUIREMENTS
Fiscal Year Ending June 30, 2006

		2006
		<u>Operating</u> <u>Expenses [1]</u>
		(b)
1	Scenario: 100% County Waste to System	
2	Recycling Operations	\$128,000
3	Solid Waste Management	\$826,000
4	Landfill Operating & Maintenance Expense	\$1,007,000
5	Out-of-County Transportation & Disposal	\$7,754,000
6	New Landfill Cell Debt Service	\$2,550,000
7	Existing Debt (Principal & Interest)	\$1,243,000
8	Solid Waste Fund Deficit Recovery	<u>\$1,000,000</u>
9	Total Revenue Requirements	<u>\$14,508,000</u>
10	Scenario: Current Waste Stream Received at County	
11	Recycling Operations	\$89,000
12	Solid Waste Admin/Supervision/Closed LFs	\$826,000
13	Landfill Operating & Maintenance Expense	\$966,000
14	Out-of-County Transportation & Disposal	\$5,405,000
15	New Landfill Cell Debt Service	\$2,550,000
16	Existing Debt (Principal & Interest)	\$1,243,000
17	Solid Waste Fund Deficit Recovery	<u>\$1,000,000</u>
18	Total Revenue Requirements	<u>\$12,079,000</u>

EXHIBIT B
CARROLL COUNTY, MARYLAND
SOLID WASTE MANAGEMENT
SERVICES PROVIDED

By Generator Sector

Service	Residential	Residential	Non-
	Single Family	Multi Family	Residential
	(a)	(b)	(c)
1 Recycling Operations	x	x	x
2 Solid Waste Management	x	x	x
3 Landfill Operating & Maintenance Expense	x	x	x
4 Out-of-County Transportation & Disposal	x	x	x

By Municipality

Municipalities	Waste Managed within County Infrastructure			
	Residential Refuse	Commercial Refuse	Recycling	Yard Waste
5 Hampstead	No	No	Yes	Yes
6 Manchester	Yes	Partial	Yes	Yes
7 Mt. Airy	No	No	Yes	Yes
8 New Windsor	Yes	Partial	Yes	Yes
9 Sykesville	Yes	Partial	Yes	Yes
10 Taneytown	Yes	Partial	Yes	Yes
11 Union Bridge	Yes	Partial	Yes	Yes
12 Westminster	No	No	Yes	Yes
13 County Unincorporated	Yes	Partial	Yes	Yes

EXHIBIT C-1
CARROLL COUNTY, MARYLAND
SOLID WASTE MANAGEMENT
PROJECTED TIP FEE BILLING UNITS
Fiscal Year Ending June 30, 2006 through 2010

Waste Type	Tons				
	Projected 2006	Projected 2007	Projected 2008	Projected 2009	Projected 2010
1 Scenario: 100% County Waste to System					
2 C&D & Sludge/Landfilled	16,800	17,100	17,400	17,800	18,100
3 Other Non-Processible Waste	7,200	7,400	7,500	7,700	7,800
4 Yard Waste	6,000	6,000	6,000	6,000	6,000
5 Transported Out-of-County	157,800	161,000	164,300	167,500	170,900
6 <u>Total (Tons)</u>	187,800	191,500	195,200	199,000	202,800
7 Scenario: Current Waste Stream Received at County					
8 C&D & Sludge/Landfilled	11,700	11,900	12,200	12,400	12,600
9 Other Non-Processible Waste(recyc	5,000	5,200	5,300	5,400	5,500
10 Yard Waste	6,000	6,200	6,400	6,600	6,800
11 Transported Out-of-County	110,000	112,200	114,400	116,700	119,100
12 <u>Total (Tons)</u>	132,700	135,500	138,300	141,100	144,000

EXHIBIT C-2
CARROLL COUNTY, MARYLAND
SOLID WASTE MANAGEMENT
PROJECTED SBC BILLING UNITS
Fiscal Year Ending June 30, 2006

	<u>Units</u>	
1	45,853	
2	6,637	
3	17,065,942	Sq. Ft.
4	9,854,767	Sq. Ft.
5	3,596,442	Sq. Ft.
6	125,000	Sq. Ft.
7	<u>3,000,946</u>	Sq. Ft.
8	33,643,097	Sq. Ft.
9	8,533	2,000 Sq. Ft.
10	4,927	2,000 Sq. Ft.
11	1,798	2,000 Sq. Ft.
12	63	2,000 Sq. Ft.
13	<u>1,500</u>	2,000 Sq. Ft.
14	16,821	2,000 Sq. Ft.

[1] Source: Single and multi-family household counts from 2000 U.S. Census, escalated to 2006 based on population growth

[2] Source: Commercial establishment counts from 2002 Economic Census data, escalated to 2006. Square footage estimates were derived by applying Frederick County average square footage for like business types to the Economic Census totals.

EXHIBIT D
CARROLL COUNTY, MARYLAND
SOLID WASTE MANAGEMENT
PROJECTED SOLID WASTE GENERATION IN TONS
Fiscal Year Ending June 30, 2006

	Units	Generation Rate Tons/Year	Waste Generation in Tons	Waste Generation Percent	
1	Single Family	45,853	2.1	96,291	64.3%
2	Multi Family	6,637	1.1	7,301	4.9%
3	Total Residential	<u>52,490</u>		<u>103,592</u>	<u>69.1%</u>
4	Commercial Low	8,533 2,000 Sq. Ft.	1.0	8,533	5.7%
5	Commercial Medium Low	4,927 2,000 Sq. Ft.	3.0	14,781	9.9%
6	Commercial Medium	1,798 2,000 Sq. Ft.	5.0	8,990	6.0%
7	Commercial Medium High	63 2,000 Sq. Ft.	7.0	441	0.3%
8	Commercial High	1,500 2,000 Sq. Ft.	9.0	13,500	9.0%
9	Total Commercial	<u>16,821 2,000 Sq. Ft.</u>		<u>46,245</u>	<u>30.9%</u>
10	Total	69,311		149,837	100%

EXHIBIT E-1
CARROLL COUNTY, MARYLAND
SOLID WASTE MANAGEMENT
RATES AND PROJECTED REVENUES
Fiscal Year Ending June 30, 2006

Scenario: 100% County Waste to System

<u>Landfill Tipping Fee Revenues</u>		<u>Units</u>	<u>Tip Fee</u>	<u>Revenue Sufficiency</u>	
1	C&D & Sludge/Landfilled	16,800 tons	\$54.00	\$907,200	
2	Other Non-Processible Waste	7,200 tons	\$54.00	\$388,800	
3	Yard Waste	6,000 tons	\$15.00	\$90,000	
4	<u>Transported Out-of-County</u>	157,800 tons	\$54.00	\$8,521,200	
5	Revenues from Tip Fees			<u>\$9,907,200</u>	
<u>System Benefit Charge Revenues</u>			<u>Revenue Share</u>	<u>Revenue Sufficiency</u>	<u>SBC</u>
6	Single Family Residential [1]	45,853	64.3%	\$3,422,831	\$74.65
7	Multi Family Residential [2]	6,637	4.9%	\$259,515	\$39.10
8	Commercial Low	8,533 2,000 Sq. Ft.	5.7%	\$303,319	\$35.55
9	Commercial Medium Low	4,927 2,000 Sq. Ft.	9.9%	\$525,415	\$106.64
10	Commercial Medium	1,798 2,000 Sq. Ft.	6.0%	\$319,564	\$177.73
11	Commercial Medium High	63 2,000 Sq. Ft.	0.3%	\$15,676	\$248.83
12	Commercial High	1,500 2,000 Sq. Ft.	9.0%	\$479,879	\$319.92
13	<u>Total Commercial</u>	<u>16,821 2,000 Sq. Ft.</u>	<u>30.9%</u>	<u>\$1,643,854</u>	
14	Revenues from System Benefit Charges			<u>\$5,326,200</u>	
15	Unadjusted Revenue Sufficiency Needs			\$14,508,000	
16	Contingency (5%)			\$725,400	
17	<u>Grand Total Revenue Sufficiency</u>			<u>\$15,233,400</u>	

[1] Includes Town Houses, Agricultural and Exempt.

[2] Includes Apartments and Residential Condominiums.

Apartment units calculated based on assumed 1,000 sq. ft. per unit.

EXHIBIT E-2
CARROLL COUNTY, MARYLAND
SOLID WASTE MANAGEMENT
RATES AND PROJECTED REVENUES
Fiscal Year Ending June 30, 2006

Scenario: Current Waste Stream Received at County

<u>Landfill Tipping Fee Revenues</u>		<u>Units</u>	<u>Tip Fee</u>	<u>Revenue Sufficiency</u>	
1	C&D & Sludge/Landfilled	11,700 tons	\$54.00	\$631,800	
2	Other Non-Processible Waste	5,000 tons	\$54.00	\$270,000	
3	Yard Waste	6,000 tons	\$15.00	\$90,000	
4	<u>Transported Out-of-County</u>	110,000 tons	\$54.00	\$5,940,000	
5	Revenues from Tip Fees			<u>\$6,931,800</u>	
<u>System Benefit Charge Revenues</u>			<u>Revenue Share</u>	<u>Revenue Sufficiency</u>	<u>SBC</u>
6	Single Family Residential [1]	45,853	64.3%	\$3,695,921	\$80.60
7	Multi Family Residential [2]	6,637	4.9%	\$280,221	\$42.22
8	Commercial Low	8,533 2,000 Sq. Ft.	5.7%	\$327,520	\$38.38
9	Commercial Medium Low	4,927 2,000 Sq. Ft.	9.9%	\$567,335	\$115.15
10	Commercial Medium	1,798 2,000 Sq. Ft.	6.0%	\$345,061	\$191.91
11	Commercial Medium High	63 2,000 Sq. Ft.	0.3%	\$16,927	\$268.68
12	Commercial High	1,500 2,000 Sq. Ft.	9.0%	\$518,167	\$345.44
13	<u>Total Commercial</u>	<u>16,821 2,000 Sq. Ft.</u>	<u>30.9%</u>	<u>\$1,775,008</u>	
14	Revenues from System Benefit Charges			<u>\$5,751,150</u>	
15	Unadjusted Revenue Sufficiency Needs			\$12,079,000	
16	Contingency (5%)			\$603,950	
17	<u>Grand Total Revenue Sufficiency</u>			<u>\$12,682,950</u>	

[1] Includes Town Houses, Agricultural and Exempt.

[2] Includes Apartments and Residential Condominiums.

Apartment units calculated based on assumed 1,000 sq. ft. per unit.

EXHIBIT F-1
CARROLL COUNTY, MARYLAND
SOLID WASTE MANAGEMENT
Development of Solid Waste Impact Fee
Equity Buy In Method

	<u>As of</u> <u>June 30, 2004</u>
Capital Assets [1]	
Land	\$1,794,154
Buildings	1,576,710
Autos, machinery and equipment	3,162,061
Subtotal	<u>6,532,925</u>
Less Accumulated Depreciation	<u>(2,759,825)</u>
Total Net Capital Assets	3,773,100
Landfill Closure/Postclosure [1]	<u>9,563,430</u>
Subtotal	13,336,530
Less Outstanding Bonds [1]	<u>(5,626,431)</u>
Total Equity Investment	<u><u>\$7,710,099</u></u>
Total Tons	149,837
Average Equity Investment per Ton	<u><u>\$51.46</u></u>
Single Family	\$108.07
Multi Family	\$56.61
Commercial Low	\$51.46
Commercial Medium Low	\$154.38
Commercial Medium	\$257.30
Commercial Medium High	\$360.22
Commercial High	\$463.14

[1] Source: Carroll County 2004 Comprehensive Annual Financial Report

EXHIBIT F-2
CARROLL COUNTY, MARYLAND
SOLID WASTE MANAGEMENT
Development of Solid Waste Impact Fee
Incremental Method -- 600 TPD WTE Option

Growth in Customer Base		2006	2012	Increase
1	Single Family Residential HHs	45,853	53,681	7,828
2	Multi Family Residential HHs	6,637	7,770	1,133
3	Total Residential HHs	52,490	61,451	8,961
4	Commercial Low units	8,533	9,990	1,457
5	Commercial Medium Low unit	4,927	5,768	841
6	Commercial Medium units	1,798	2,105	307
7	Commercial Medium High unit	63	74	11
8	Commercial High units	1,500	1,756	256
9	Total Commercial units	16,821	19,693	2,872

Growth in Waste Generation (tons)		2006	2012	Increase
1	Single Family Residential	96,291	112,731	16,439
2	Multi Family Residential	7,301	8,547	1,246
3	Total Residential	103,592	121,278	17,686
4	Commercial Low	8,533	9,990	1,457
5	Commercial Medium Low	14,781	17,304	2,523
6	Commercial Medium	8,990	10,525	1,535
7	Commercial Medium High	441	516	75
8	Commercial High	13,500	15,805	2,305
9	Total Commercial	46,245	54,140	7,895
10	Total	149,837	175,418	25,581
11	Percent of 2012 Generation attributable to '06 to '12 growth			0

600 TPD WTE Facility Capital Cost

1	2012 Project Capital Cost	\$167,000,000
2	2006 Net Present Value	\$124,617,971
3	Percentage of Cost attributable to '06 to '12 growth	0
4	Proportion of Future Costs Recoverable by Impact Fee	\$18,172,753

Incremental Method Impact Fees

1	Single Family Residential (per HH)	\$1,492
2	Multi Family Residential (per HH)	\$781
3	Commercial Low (per 2,000 sq ft)	\$710
4	Commercial Medium Low (per 2,000 sq ft)	\$2,131
5	Commercial Medium (per 2,000 sq ft)	\$3,552
6	Commercial Medium High (per 2,000 sq ft)	\$4,973
7	Commercial High (per 2,000 sq ft)	\$6,394