Chapter 4
Allocating Costs

The Difference Between Costs and Outlays

Recognizing the difference between costs and outlays is essential to FCA. This *Handbook* defines cost to mean the dollar value of resources as they are used or committed in an MSW program. An outlay is defined as an expenditure of cash to acquire or use the resource. For example, a cash outlay is made when a collection truck is acquired, but the cost of the truck would be incurred over its active life. The cost of the truck, therefore, should be allocated over the period of its use because every year of use contributes to the deterioration of the truck's value, until it must be replaced with a new truck, requiring a new cash outlay.

Similarly, outlays for constructing and permitting a landfill are made before its active life, while outlays for closure and post-closure care are made after its active life. All of these outlays are needed to acquire and use the resource of landfill capacity. Therefore, the costs of using this resource should recognize those up-front and back-end outlays as the landfill capacity is used during its operating life.

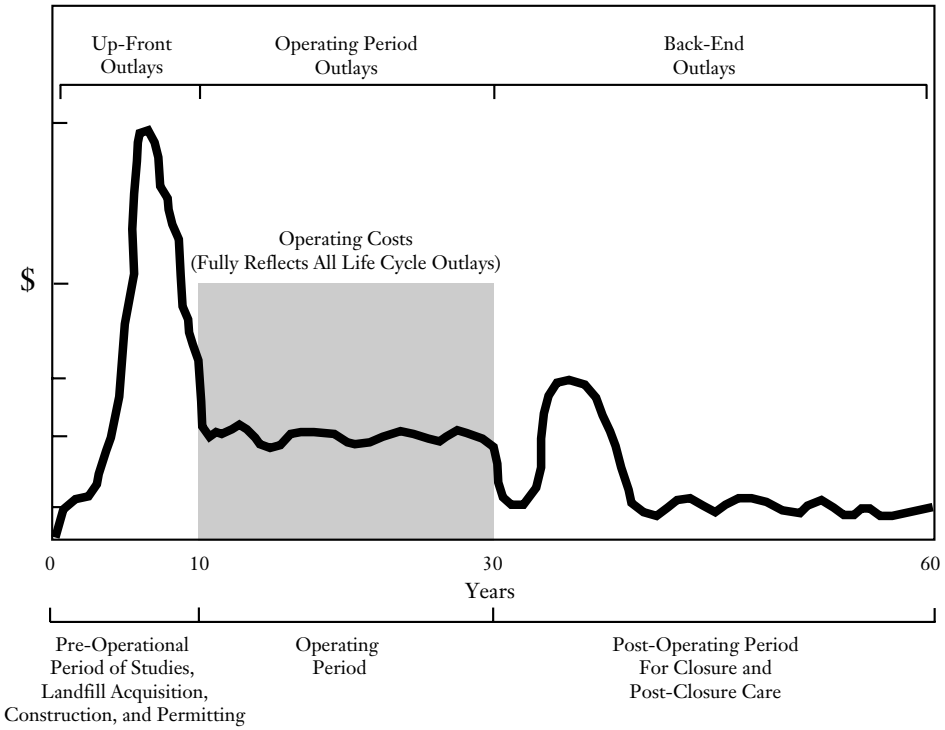
This distinction is important because while current governmental accounting practices account for outlays of public funds, they do not serve as a good basis for estimating the costs of MSW management. For example:

- Many communities acquired and developed landfill sites years ago. Current cash flow does not reflect those past outlays.
- Some necessary cash outlays will occur after a waste management facility ceases operations, such as outlays for site closure and post-closure care.
- Many costs due to MSW management might be hidden in "overhead" outlays or simply not recognized as costs because no outlays occur.

Exhibit 4-1 illustrates cash outlays (dark line) for land disposal over time. Cash outlays typically peak at the front and back end of a landfill's life. Yet these outlays all support the operating life of the facility, shown as the shaded area. The dotted line represents the full costs of the facility spread evenly over its operating life. Cash outlays (dark line) during the operating life of the landfill are substantially less than the full cost (shaded area). As a result, relying on cash outlays can be misleading. As one necessary step to determine the full costs of MSW management, outlays should be converted to costs. How they are converted depends on whether they are routine cash outlays, capital outlays, or future outlays.

Exhibit 4-1

Illustration of Landfill Life Cycle Outlays and Costs



Routine Cash Outlays, Capital Outlays, and Future Outlays

Routine cash outlays for solid waste management activities are usually the same as the operating costs of those activities. Operating costs are regularly recurring costs of resources that are used over a short period of time (i.e., less than 1 year) and routinely reacquired in order to support ongoing operations. Operating costs generally include the following:

- Personnel wages, salaries, benefits
- Building and vehicle maintenance
- Power and fuel
- Rent and leases
- Contract services
- Interest (including mortgage interest)

The cash outlays for these items might be made biweekly or monthly, and these items actually are "used up" over the same period of time. For the purposes of an annual FCA report for solid waste management activities, cash outlays throughout the year for these routine, recurring expenditures equal their operating costs.

A *capital outlay* is an outlay of cash to acquire a resource that will be used for more than one year. Examples include the purchase price of collection vehicles and other equipment, as well as the up-front siting, land acquisition, and construction outlays for new landfills and facilities. Cash flow accounting

would record these capital outlays in the year that the resources are acquired, overstating the cost of solid waste management services during that year and understating costs during subsequent years. A capital outlay can be converted into an annual cost using the established accounting technique of *depreciation*.

- **Depreciation** is a method of allocating the costs of capital outlays over the useful life of the resource. A simple "straight-line" depreciation method calculates depreciation costs by dividing the capital outlay by the useful life of the resource acquired. For example, a collection truck that costs $150,000 with a useful life of 10 years would have an annual depreciation cost of one-tenth of its total capital cost, or $15,000. Similarly, if a landfill is expected to last 20 years, then the annual depreciation cost for up-front land acquisition, landfill construction, and permitting would be one-twentieth of that outlay.[a]

You might need to review outlay accounts from prior years to determine which outlays were made to acquire resources that are still in service and to calculate the depreciation associated with those assets. For example, if you have 20 mixed waste collection trucks in service, and your records indicate you have made outlays of $1,800,000 over the past 10 years to acquire those trucks, then annual depreciation for the collection trucks would be $180,000 (i.e., one-tenth of outlays, based on a 10-year useful life). No depreciation should be recorded for assets that have remained in service after their estimated useful life, if they already have been 100 percent depreciated. The inventory of equipment, vehicles, facilities, and land discussed in Chapter 3 can be very helpful in identifying those outlays that need to be depreciated:

Depreciate	Don't Depreciate
Owned equipment, vehicles, and structures	Leased equipment, vehicles, and structures
Up-front developmental expenses for programs and facilities	Back-end expenses (amortize these instead)
Landfill property (i.e., capacity)	All other land

How do you value assets for which outlay information cannot be found? The preferred option is to estimate the original outlay for the asset, based on the known prices of comparable items, when the asset was likely purchased. Another way is to determine (appraise) the asset's current market value (e.g., through an appraisal) and remaining useful life. Both of these options are preferable to valuing an asset based on the price of replacing it with a new one. However, replacement value can be an acceptable measure for some purposes, (e.g., when using FCA for financing capital replacement funds). For assets that appear to be "free," see the section below on uncovering hidden costs.

[a] An alternative to setting fixed depreciation schedules for up-front landfill costs is to depreciate those costs as landfill capacity is actually used (e.g., per cubic yard of volume). This is more accurate but more complicated than the straight-line method mentioned above.

Exhibit 4-2

Standard Life for Selected MSW Heavy Equipment

Standard Description	Standard Life Years	Standard Description	Standard Life Years
Backhoe, Tamper Wheeled	5	Trailer, Recycling	7
Backhoe, Tamper Track	8	Trailer, Transfer (aluminum)	8
		Trailer, Transfer (top loading steel)	8
Compactor, Landfill	5	Truck, Automated, 13-15 cy	5
Compressor, Air	5	Truck, Automated, 18-20 cy	5
Forklift, Gas	8	Truck, Automated, 25 cy	5
Grader, Road	8	Truck, Semi-Automated	5
Loader, Wheeled (w/claw)	5	Truck, Flatbed	7
Scraper, Earth	5	Truck, Water	10
Sweeper, Street	7	Truck, Tractor w/Fifth Wheel	8
Tanker, Water	7	Truck, Other	5
Tractor, Crawler	5	Truck, Rearloader	5
Trailer, Fuel	10	Truck, Recycling, 37 cy	7
Trailer, Equipment	10	Truck, Recycling, 20 cy	7

Source: Sacramento County, 2/93

To determine useful lives of equipment, vehicles, structures, and landfills, rely on local experience (e.g., how long have compactor trucks lasted in the past), design specifications, and vendors' representations. Exhibit 4-2 presents standard operating life values for selected heavy equipment used by Sacramento County, California.

Buildings, vehicles, and equipment that are owned should be depreciated over their remaining useful lives. If the purchases were financed, interest payments should be included as operating costs. Buildings, vehicles, and equipment that are leased generally should not be depreciated; you can treat lease payments as operating costs. In general, you should not depreciate capital outlays for land; land acquired for use as a landfill has a finite useful life and should be depreciated, however.

What about up-front developmental costs for new MSW programs, such as recycling? Outlays for community education and program planning can be substantial. These up-front expenses should be "capitalized" (i.e., treated as a capital outlay) and depreciated over the useful life of the program being launched. The continuing expenses of maintaining MSW programs and public education are simply operating costs.

A *future outlay* is an expenditure of cash in the future that is obligated by current or prior activities. For example, once you commence landfill operations you are obligated to conduct landfill closure and post-closure care in the future. Also, employee retirement benefits, such as pensions and health care, are future outlays obligated by current employee services. Cash flow accounting would record these outlays in the years they are paid, overstating the full cost of solid waste management services during those years and understating costs during prior years. A future outlay can be converted into a cost using the established financial technique of *amortization*.

Buying and Depreciating a 3-Year Lease

Although lease outlays usually are treated as operating costs and not depreciated, situations could arise where depreciation is appropriate—for example, where a multi-year lease is purchased for a one-time, up-front payment. Depending on the market for particular buildings, vehicles, and equipment, a vendor might be willing to cut an attractive deal. In such circumstances, the outlay should be depreciated proportionately over the life of the lease.

- **Amortization** is a method of determining the annual costs associated with future outlay obligations. In general usage, amortization refers to any process of liquidating (i.e., allocating) a debt over time, as in the amortization schedule for a mortgage. Thus, the amortization of future outlays for landfill closure and post-closure care recognizes that cost during landfill operation.

Amortization of Future Landfill Closure and Post-Closure Care Outlays. A special issue for MSW landfills involves the recognition of the financial obligations associated with landfill closure and post-closure care activities. Cash outlays for these future liabilities might not occur for many years. To ensure that government financial statements systematically and appropriately recognize the costs of landfill closure and post-closure care, GASB Statement No. 18 (August 1993)[8] establishes a consistent method for government entities to use. This method requires the estimated total current cost of closure and post-closure care (i.e., the amount that would be paid if all equipment and activities covered in the estimate were acquired during the current year) to be recognized in proportion to the filled capacity of the landfill. As prescribed in the following formula, the cost to be recognized in a given year equals:

$$\frac{\text{Estimated total current cost x cumulative capacity used}}{\text{Total estimated capacity}} - \text{Amount previously amortized}$$

The designated amount should be reported as a cost in each year that the landfill accepts waste. Closure and post-closure costs should include the cost of supplies, equipment, facilities (e.g., final cover), and services (e.g., monitoring) that will be incurred near or after the date that the landfill stops accepting waste, regardless of their capital or operating nature. The current cost estimate should be adjusted each year for the effects of inflation or deflation, as well as more stringent regulatory requirements and changes in operating plans, if applicable.

Although closure and post-closure care regulations apply only to MSW landfills, future outlays for decommissioning other solid waste management facilities also should be estimated and amortized as a good management practice.

If closure/post-closure obligations are amortized correctly, then any outlays to trust funds used to demonstrate financial responsibility for those obligations should not be treated as costs of closure/post-closure care. Only the transaction

costs and service fees paid to trustees, or other fees involved in securing other instruments, should be recognized as costs. These financial responsibility fees (outlays) constitute operating costs.

Uncovering Hidden Costs

Hidden costs, as used in this *Handbook*, are the costs of activities or resources that appear to be free (i.e., no outlays are recorded or anticipated). Examples include the following:

- The City of Charlotte has an agreement with Mecklenberg County, North Carolina, that allows Charlotte to dispose of 170,000 tons of MSW per year at no cost.[9] Is MSW disposal free for Charlotte? No. In fact, Charlotte received the right to dispose of its waste at no charge in exchange for the transfer of municipal assets to Mecklenberg County. Thus, depreciating the value of those assets over the life of the agreement would be one way to measure the cost of waste disposal to Charlotte. Another way would be to consider the current market value of the disposal rights owned by the city; instead of selling those rights, Charlotte is using them.
- Sacramento County's Solid Waste Enterprise Fund initially was financed by a loan from the county government with no interest and no principal repayment for the first 10 years.[9] Although the capital was free to the enterprise fund during this initial period, capital is never free—in this case, the county government lost the interest income. From an FCA perspective, it might not matter which public entity incurs the cost.
- Many small towns have been deeded their landfills by former owners. Some towns have received gifts of composting equipment. Regardless of how they have been acquired, such assets have value. That value is consumed over time with use. Thus, there is a cost even where there has been no outlay.

The value of using goods and services should be reflected as a cost, even if there is no outlay. In general, items that are necessary or would otherwise need to be purchased (as in the examples above) should be valued and costed. Conversely, you can decide whether items that are neither necessary nor would be otherwise purchased should be costed and recognized. As described in Chapter 3, a starting point for FCA should be a detailed description of MSW activities and an inventory of physical assets and human resources to ensure that the costs and value of each activity are reflected in the full cost.

Overhead Costs

Overhead costs are the management and support costs of running a solid waste program. Management and support labor costs (including benefits) should be accounted for, together with a proportionate share of the office costs (e.g., rent, office equipment, and utilities) incurred for management and support. Specifically, overhead for a solid waste program can include:

- Management
- Executive oversight
- Advisory committees and coordinating bodies

Case in Point
Prince William County, Virginia

Overhead costs can be significant. When projecting the costs of operating a solid waste enterprise fund, the cost for county administration is often overlooked. For example, services provided by the county attorney's office, finance department (account analysis, consulting services, investing services, and financial statement preparation), the treasurer's office (cash collection, recordation, and deposit), and the budget office (budget preparation and analysis) should be included.

In Prince William County, these costs average approximately $300,000-$400,000 annually. As a result, overlooking them can significantly skew your assessment of how much MSW management costs in your community.[10]

Case in Point
Sacramento County, California

In Sacramento County, California, solid waste management is administered by the Solid Waste Division of the Department of Public Works. The time spent at the division level directing the performance of MSW transfer station, transport, recycling, and disposal activities is an exclusive overhead cost that should be recognized. Because the Solid Waste Division is a unit of the Department of Public Works a portion of the departmental management costs should be included as a shared overhead cost in FCA.

- Billing services
- Clerical support
- Data management
- Human resources
- Legal
- Maintenance
- Payroll and accounting
- Personnel
- Purchasing
- Records management
- Training expenses

Depending on the community, some overhead costs will be exclusive to the MSW program while others will be shared costs.[b] A given overhead item might be an exclusive cost in one town but a shared cost in another. Exclusive overhead costs apply solely to MSW management; shared costs involve more than MSW management (see Exhibit 4-3). For example, the costs of running a solid waste advisory committee should be considered an exclusive overhead cost, but the costs of running a citizens' advisory committee for county planning in general should be treated as a shared overhead cost. If your MSW program operates its own garage for vehicle storage and maintenance, those costs are exclusive overhead costs. If MSW vehicles are stored and serviced together with other community vehicles, those garage costs are shared overhead costs. Because many overhead costs are not exclusive to an MSW program, they are easy to overlook. Overhead costs also can be overlooked because they do not appear to be directly involved in the movement of MSW from residences to processing, treatment, or disposal facilities.

Exhibit 4-4 presents a format for identifying and recording overhead costs.

[b] Accountants may refer to exclusive and shared costs using the terms direct and indirect, respectively. See the 1994 *Governmental Accounting, Auditing and Financial Reporting* (GAAFR)[11].

Exhibit 4-3

Types of Overhead Costs		
	Type of Cost	
Type of Overhead	Exclusive	Shared
Oversight		
Support Services		

Exhibit 4-4

Overhead Services Can Be Exclusive or Shared Costs			
Item	Exclusive	Shared	Total
Accounting			
Billing			
Building Operations			
Clerical			
Data Processing			
Executive Oversight			
Insurance			
Legal			
Management			
Outreach			
Payroll			
Personnel			
Purchasing			
Records Management			
Solid Waste Advisory Council			
Other			
Total Overhead Costs			

Allocating Shared Costs

Because shared costs do not apply exclusively to MSW management but to other government activities as well, you should allocate only a portion of these costs to MSW. This allocation can be made on an aggregate basis for all shared costs or on a line item basis. It might make sense to treat some line items individually and group the remaining costs for aggregate treatment. The goal is to identify MSW's fair share of costs and reflect that amount in the FCA report.

There are two relatively simple methods for allocating shared costs to MSW: 1) size of budget relative to the other government activities and 2) number of personnel.

Budget Share Method

To allocate shared costs according to the budget share method, you first need to determine the annual budgets of all government programs, excluding the costs of functions being treated as shared. If your annual budget is $13 million, and $3 million is spent by centralized support and oversight services, then $10 million can be used as the denominator in the equation below. The numerator is the budget of the MSW program itself. If you spend $2 million on MSW, then the quotient (.2) becomes the allocation multiplier, as shown:

$$\frac{\text{MSW annual budget}}{\text{Total budget minus centralized services}} = \text{Allocation Multiplier}$$

Example

$$\frac{\$2 \text{ million}}{\$13 \text{ million} - \$3 \text{ million} = \$10 \text{ million}} = .2$$

MSW's portion of the shared costs is calculated by applying the allocation multiplier against the total shared costs:

$$\text{Allocation Multiplier} \times \text{Shared Costs} = \text{MSW's Portion of Shared Cost}$$

Example

$$.2 \times \$3 \text{ million} = \$600{,}000$$

Case in Point
Upper Arlington, Ohio

For its yard trimmings collection and disposal program, Upper Arlington, Ohio, assigns one full-time employee, assisted by a part-time employee during the spring and summer. One vehicle is used for weekly collection and disposal. To determine the cost of collecting and disposing of yard trimmings, the town:

1. Analyzed total city expenditures to determine which costs should be considered overhead.
2. Determined which costs have to be allocated.
3. Determined the method for allocating costs.
4. Determined the costs of yard trimmings collection and disposal.
5. Added the allocated overhead costs to nonoverhead costs to obtain total costs.[12]

Estimated costs for 1992 were:

Exclusive Costs	
Personnel and operating costs	$64,866
Vehicle costs	
Gas, oil, parts	$3,400
Labor	1,815
Depreciation	14,292
Interest expense	3,836
Total exclusive costs	**$88,209**

Allocated Costs	
Divisional administration	$13,648
Department administration	9,192
Citywide administration	15,439
Total allocations	**$38,279**
Total yard trimmings cost	**$126,488**

Thus, annual MSW management costs $2,600,000 in this example. Two million dollars are exclusive costs, and $600,000 are shared costs.

Personnel Share Method

The personnel share method is similar. The numerator in the equation below is the number of employees (or full-time equivalents) in solid waste management, including both salaried personnel and wage earners. The denominator is the total number of personnel involved in government programs minus the personnel in the shared overhead and service units. The quotient is the allocation multiplier, as shown:

$$\frac{\text{MSW personnel}}{\text{All personnel minus centralized service staff}} = \text{Allocation Multiplier}$$

MSW's portion of the shared costs is calculated in the same way as shown above. Applying the allocation multiplier to the total shared costs produces MSW's share.

The two methods might yield somewhat different results, but extreme precision is not necessary. For some shared costs, there might be no single "correct" allocation multiplier. Where local governments contract out significant activities, the budget share method might be preferable, because contract costs should be easier to determine than the number of contractor personnel.

For specific shared cost line items, the following allocation multipliers could be used:

- Building maintenance — Share of MSW floorspace in square feet (to total government floorspace, excluding space occupied by building maintenance)
  — Personnel share method
- Vehicle maintenance — Share of vehicles
  — Share of miles driven
  — Share of fuel use
- Billing and collection — Share of MSW charges (to total amounts billed for all taxes, fees, and charges)
  — Share of MSW accounts (to total number of accounts billed)
- Human resources — Personnel share method
- Computer/office equipment services — Share of computers/printers equipment services

Behavioral Aspects of Allocations

Allocating shared costs equitably is sometimes easier said than done. Most people will readily take credit for revenues but will be more hesitant to accept responsibility for costs, even though the costs and revenues are related. This can lead to differences of opinion on how to fairly apportion costs, particularly when good data are not available. Consider the person who answers the phone at a municipal department of public works, fielding calls about solid waste as well as water/sewer service. How do you allocate this person's time and cost? Even if the costs involved are relatively small, the discussion can heat up if the allocation process and result do not seem fair. Because affected managers must perceive the allocation process to be fair, get their input when developing cost allocations.

Inter-Department Billing

Creating special accounts or inter-department billing systems can help achieve a more accurate allocation of costs. For example, if there are substantial legal costs associated with an old landfill, then an inter-department billing system can allow the legal department to charge the old landfill account directly to avoid confusing these costs with the ongoing legal costs of the new landfill. In this case, the old landfill account would record the charges as a direct cost, the new landfill account would be charged appropriately, and both accounts would receive their shared cost allocations for the more routine activities of the legal department. Small communities may need to record such inter-department charges only for unusual, one-time costs, but larger municipalities may benefit from more routine inter-department billing to keep track of the amount of support service costs devoted to solid waste management.

- Legal services — Personnel share method
  — Budget share method
- Payroll — Personnel share method
- Purchasing — Share of purchases (number of transactions or dollar value of transactions)

The level of detail and amount of effort invested should match the size of your MSW program. If shared costs represent a relatively small percentage of total solid waste management costs, then a simple allocation formula will not distort significantly the full cost estimate. Using a simple formula to allocate large shared costs that might be unrelated to ongoing solid waste management activities, however, could distort and overstate the full costs of MSW activities.

For example, if solid waste management employees account for 10 percent of all nonoverhead local government employees, then solid waste management could be allocated 10 percent of total local government support service and oversight costs. This might be a reasonably accurate way to allocate shared costs for centralized payroll and personnel services. Legal costs, however, might be largely attributable to an old landfill or other government liabilities unrelated to current solid waste management. Using the personnel share method of allocation could pose a significant potential for bias only if the legal costs being allocated are substantial. In addition, if you contract (or use franchises) for MSW services and do not directly perform many MSW activities, there might be little overhead involved and few staff, but the budget share might be substantial; the budget share method would be more appropriate than the personnel share method in this scenario.

Pulling It All Together

Following the guidance in this chapter, you can estimate the full costs of solid waste management and complete a report like the one shown in Exhibit 4-5. Exhibit 4-6 shows an annual report of expenses prepared by the Sacramento County Department of Public Works Refuse Enterprise Fund.

Exhibit 4-5

Annual Full Cost of Solid Waste Management

Operating, Up-Front, and Back-End Costs

Operating Costs	
Wages, Salaries, and Benefits	$ _____
Maintenance	$ _____
Power and Fuel	$ _____
Rent/Leases	$ _____
Contract Services	$ _____
Interest	$ _____
Insurance, Licenses, Taxes	$ _____
Oversight and Support Services	$ _____
Other	$ _____
Up-Front Costs	
Depreciation (Vehicles/Equipment/Buildings/Landfills)	$ _____
Depreciation (Oversight and Support Services, e.g., Program Planning, Permitting, and Outreach)	$ _____
Other	$ _____
Back-End Costs	
Amortized Closure and Post-Closure Care	$ _____
Amortized Retirement Benefits	$ _____
Amortized Oversight and Support Services	$ _____
Other	$ _____
Overhead Cost Share	
Executive and Management Oversight	$ _____
Centralized Support Services	$ _____
Other	$ _____
TOTAL	$ _____

Exhibit 4-6

Sacramento County Department of Public Works
Refuse Enterprise Fund Expenses
Year-to-Date Through June 30, 1993

Labor Costs	
Salaries and Employee Benefits	11,964,368
Equipment Costs	
Equipment Maintenance	4,888,243
Fuels and Lubricants	846,659
Depreciation Expense	4,613,214
Equipment Replacement Factor	1,733,710
Equipment Rental and Leases	293,243
Subtotal Equipment Costs	12,375,069
Other Operating Costs	
Household Hazardous Waste Program Contract	378,839
State Fees	953,348
Franchise Contracts Payments	2,563,931
Franchise Contracts Subsidies	124,442
Maintenance-Land Improvement	2,993,257
Other Operating Expenses	2,344,862
Unanticipated Capital Expenditures	2,425,000
Subtotal Other Operating Costs	11,783,679
General and Administrative	
Bad Debt Expense	82,459
Franchise Contracts Bad Debt Expense	979
Insurance	280,662
Communication Services	116,219
Accounting Services	17,595
Utility Billing Services	1,190,928
Facility/Leased Property Use Charges	328,975
Division and Department Overhead Allocation	1,029,220
Countywide Cost Allocation	320,710
Interest Expense	21,267
Other General and Administrative	896,286
Subtotal General and Administrative	4,285,300
TOTAL EXPENSES	40,408,416