

**THE PRICE OF
SOLID WASTE MANAGEMENT SERVICES
IN VERMONT**

2005

Overview of Survey Results

**FINAL REPORT
July 2005**

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EXECUTIVE SUMMARY

The Price of Solid Waste Management Services in Vermont - 2005 contains the results of a survey conducted by DSM Environmental Services, Inc. (DSM) for the Vermont Department of Environmental Conservation's Solid Waste Program (DEC). The objective of this survey is to determine current prices¹ charged for collection and disposal of residential and commercial municipal solid waste (MSW), residential and commercial recycling services, and collection and disposal of construction and demolition (C&D) debris.

The 2005 survey is an update to an earlier version conducted by DSM in 1999. Monitoring changes in the price of solid waste services was identified as an important indicator of potential consolidations within the waste industry in Vermont, as well as potential incentives to recycle by the DEC in the 1998 update of the *State Solid Waste Management Plan*.

This report compares current prices to baseline prices identified in 1999 where appropriate. As another point of comparison, current prices for solid waste management services in Vermont are compared to prices in neighboring states. To the extent possible, DSM followed the same methodology and has reported the data in the same way as in 1999. However, in some cases it has been necessary to change the method of reporting the data. These changes have been noted where they impact on the comparison of results.

As in 1999, DSM focused its survey for the curbside residential, commercial, and C&D analysis on four representative regions of the state: Bennington County, Chittenden County, the Vermont side of the Connecticut River upper valley (Upper Valley) and the Northeast Kingdom. For information on drop-off services and surcharges, DSM evaluated information from other regions of the state as well. The survey and analysis methodology is similar to that used in 1999, with the exception of greater emphasis on the commercial sector in 2005. Information on solid waste prices in other states is new to the 2005 report.

The major results of the study, which need to be considered in light of various data limitations and assumptions detailed in the report, are summarized in the tables below. The first table provides comparisons for price categories for which data was reported in both 1999 and 2005, and shows the percentage of price increase.

TABLE ES-1

Price Category – Statewide Averages	2005 Price	1999 Price	Increase (1)
Weekly curbside MSW and recycling (per household per month)	\$31.34	\$27.75	13.0%
Weekly curbside MSW collection (per household per month)	\$30.84	\$23.75	22%
Drop-off MSW (per bag)	\$2.44	\$2.13	14.5%
Commercial MSW collection & disposal (per loose cubic yard)	\$10.15	\$9.68	5.0%
District surcharges on MSW and C&D (per ton)	\$19.87	\$16.65	19.3%

(1) The increase in the Consumer Price Index between March 1999 and May 2005 for the Northeast Urban Area is 20%.

¹ A note on terms used in this report: "Price" is used to define the amount of money a company charges its customer. "Cost" is the amount of money paid by the customer.

The second table provides data for price categories for which price data was only available for 2005.

TABLE ES-2

Price Category	2005 Price
Commercial MSW disposal (per ton)	\$95.85
Commercial C&D disposal (per ton)	\$98.00
Commercial Cardboard Recycling (per cubic yard)	\$3.29
Commercial Office Paper Recycling (per 64 gallon tote)	\$3.35
Commercial Single Stream Recycling (per 64 gallon tote)	\$4.04

Total spending in Vermont by residents and businesses on MSW and recycling services is estimated at roughly more than 100 million dollars per year in 2005, exclusive of costs to the household or business for handling or transport of wastes and recyclables. This compares to a total spending in Vermont by residents and businesses in 1999 of 68 million dollars per year on MSW, not including recycling².

In addition to per-unit increases in solid waste costs, the total waste disposed has increased from 350,927 tons in 1997 (figure used in the 1999 report) to 418,035 tons disposed in 2003 (figure used in this report), for an increase of 19%.

Compared to information gathered about prices of MSW management in other states in the Northeast, Vermont's prices are roughly 25% higher. Potential causes include district surcharges, rural geography and distance to disposal facilities.

² Total residential spending on solid waste services is based on rough estimates of the percentage of Vermont households with curbside refuse collection service, as noted on page 13. Total commercial spending estimates were made in light of data limitations listed on pages 15 and 16. While these estimates reflect DSM's best professional judgment, they are not to be considered as statistically significant findings.

SURVEY METHODOLOGY

DSM followed a similar methodology to that used in 1999 to determine average prices for residential curbside and drop-off solid waste and recycling services, commercial waste management, and C&D management. Specifically, DSM targeted four regions of the state for focused surveying, and also conducted some surveys on a statewide basis. DSM gathered data from surveys of solid waste district managers, waste haulers and commercial generators, as well as from the Districts' Solid Waste Implementation Plans (SWIPs). In addition, DSM conducted a limited survey of local and state recycling officials in neighboring states to determine the availability of pricing information in those states and provide a summary of relevant findings.

Target Regions

DSM surveyed the same four regions in the state as were surveyed for the 1999 report to provide a basis for comparison of price changes over time and to compare prices among regions in the State. These four regions and the reason for their selection are listed below:

Region	Reason for Inclusion in Survey
Bennington County	Rural region of the State in which no one solid waste district has a lead role in public management of solid waste.
Chittenden County	Most densely populated county in the State with single, active solid waste management district.
Upper Valley	Vermont side of bi-state region where solid waste collection services and disposal options are often jointly delivered to both states.
Northeast Kingdom	Most rural region of the State where solid waste services were expected to be limited.

Groups Surveyed

DSM surveyed the following four groups:

1. Solid waste districts across the state on the types and availability of solid waste management services in their region, including cost and pricing information, and surcharges paid on MSW and C&D debris.
2. Solid waste hauling companies in the four target regions on the prices charged for residential and commercial solid waste collection and disposal, recycling collection, and C&D waste collection and disposal.

3. Commercial businesses in the four target regions on the prices they pay for solid waste collection and disposal and recycling services.
4. State and local solid waste officials in neighboring states regarding available price information on solid waste and recycling services in their areas.

District Survey

The purpose of the District Survey was to determine prices that residents pay for drop-off recycling and solid waste services, and the use of surcharges, flat fees and/or tax assessments to fund these programs. DSM reviewed prices of solid waste services in most of the solid waste districts as found in the draft and final SWIPs. DEC provided DSM with information that has been filed with the DEC from most of the Districts.

DSM met with district managers at a statewide meeting on March 16, 2005 about the price survey and requested names of haulers and businesses to contact. DSM followed up with telephone calls to solid waste district managers to ask questions on the number of drop-off solid waste and recycling locations in their districts, current prices charged for those services, surcharges or district fees placed on waste, and the tonnage of waste surcharged. DSM used the most recent data available, provided by districts and the State, for examining volumes and tonnages of waste and recyclables managed.

Solid Waste Hauling Company Survey

DSM developed and used a survey form to collect data from solid waste hauling companies over the telephone. The survey form included questions related to residential and commercial solid waste and recycling collection and disposal prices, as well as C&D waste collection and disposal prices.

As in the 1999 Report, the DEC provided a list of registered solid waste haulers for use in the survey. In addition, DSM asked district managers in the target districts for names of haulers that should be included in the survey, and identified other haulers through research on the internet. DSM screened this list based on the regions that haulers serve, and type of services that they provide. For example, companies for whom hauling is ancillary to their primary business (e.g., construction or plumbing) were not surveyed.

DSM grouped the haulers by region and attempted to contact at least 75% of listed haulers in each of the four target regions. DSM made at least three attempts to contact and survey selected haulers. DSM told haulers that the survey was being conducted for the state DEC, and that their responses would be held confidential. In Chittenden County, where District staff was planning to also survey haulers for a separate purpose, DSM and District staff divided haulers to survey and shared results with the understanding that each party would hold those results confidential.

DSM asked haulers about the residential curbside solid waste and recycling services provided and the pricing structure used (e.g., whether the charge was a flat monthly fee for weekly or bi-weekly service, a unit-based fee, or a combination), and whether there were volume limits on waste and recycling). DSM placed greater emphasis on questions relating to commercial waste

collection than in the 1999 survey, by asking questions affecting commercial prices including location, type of container leased, use of compactor versus un-compacted waste collection and type of waste. DSM also asked about pricing for C&D services, including tonnage or volume charges, container rental, and delivery rates.

As noted in Table 1, DSM collected survey data from a total of 28 hauling companies in the four regions, which is more than half of all identified haulers in the target regions. A majority of haulers surveyed were larger businesses, while a few were smaller companies with only one or two trucks. Of the 28 hauling companies surveyed, 27 provided service to residents, 15 provided service to commercial customers, and 12 offered C&D collection and disposal services.

TABLE 1 HAULERS SURVEYED BY REGION AND SERVICES PROVIDED

Region	# Haulers Surveyed	HAULING SERVICES PROVIDED				
		Residential MSW	Residential Recycling	Commercial MSW	Commercial Recycling	C&D Collection
Bennington County	2 (1)	2	2	2	2	2
Chittenden County	13	13	13	6	6	4
Upper Valley	5	5	2	3	3	3
Northeast Kingdom	8	7	3	4	2	3
Total	28	27	20	15	13	12

(1) One additional Bennington County hauler was surveyed, however as it recently sold its business, it is not counted in the results.

Generator Survey

DSM conducted a limited survey of commercial generators in each of the four regions to determine the prices they are charged for solid waste and recycling collection and disposal services. DSM developed a list of businesses representing different industries and services, with similar representation as in 1999. The purpose of the generator survey was to verify the prices quoted by haulers. In total, 14 companies in the four target regions provided price information.

Neighboring State Survey

DSM sent an email through the Northeast Recycling Coalition (NERC) to state recycling officials in the NERC states related to solid waste management price information for residential, commercial and C&D waste. DSM followed up with information requests to state contacts, and the Northeast Resource Recovery Association. DSM received responses from Connecticut, Maine, Massachusetts, Rhode Island and Delaware. In addition, DSM contacted by telephone local solid waste officials in selected communities in New Hampshire, Massachusetts and New York to ask about similar information on the local level.

RESULTS

Based on survey data and other information gathered, results were compiled in three categories for the target regions: residential service, commercial service, and construction and demolition debris service. In addition, information on drop-off programs and surcharges was gathered from most other regions in the state. Finally, other state information was gathered and summarized.

Residential Costs

Curbside

Table 2 presents the results for the four target regions for the average monthly prices charged for weekly residential curbside MSW collection and weekly recycling collection. The prices include both collection and disposal costs. The prices shown by region are calculated by averaging prices charged by the surveyed haulers in that region. These regional prices were then averaged to provide a price for the entire State. In the case of combined curbside trash and recycling, a weighted average was used based on population in the target regions, to appropriately adjust for the low cost and high population in Chittenden County.

The 2005 weighted average cost per household for recycling and trash collection is \$31.43. This compares to the average household cost in 1999 of \$27.75 for an increase of 13%.

Of interest is that in 1999, Chittenden County was the only region where a combined MSW and recycling cost was available, and in 2005 that combined pricing structure is available in at least some towns in all four regions. In Chittenden County with mandatory recycling, no hauler offers just solid waste collection. (In Burlington, the municipality provides curbside recycling, which residents pay for in fees to private curbside MSW collector, who in turn passes on fees to City.)

TABLE 2 CURBSIDE RESIDENTIAL COLLECTION PRICES SUMMARY

Region	Monthly Cost for Weekly Residential MSW Collection and Bi-weekly Recyclables Collection			
	Cost/HH For MSW & Recycling	Cost/HH For MSW Only	Cost Per Bag @ 32 Gallons (1)	Average Max. Set-out Vol. Per Week (2)
Bennington	\$38.75	\$34.76	\$3.04	80 Gal
Chittenden	\$28.98	NA	\$3.12	88 Gal
Upper Valley	\$40.88	\$32.48	\$3.00	86 Gal
Northeast Kingdom	\$32.50	\$25.29	\$2.65	79 Gal
Average Cost in State	\$35.28	\$30.84	\$2.95	83 Gal
Weighted Average (3)	\$31.34			

(1) Cost per bag is the average of reported prices for both haulers with unit based pricing (per bag or toter charges) and haulers that charge a flat monthly fee for a maximum volume of waste, and assumes maximum volume is used. Monthly charges assume 4.33 weeks in a month.

(2) All reported responses for set out maximums are included for each region. If a hauler had both weekly and bi-weekly charges, bi-weekly set-outs were counted at one-half. If a hauler had several rates for varying volumes the average volume was used. Only three haulers surveyed reported set-out limits on recyclables; all three were in Chittenden County and all were in the range of two bins.

(3) A weighted average is used for curbside collection costs to reflect for the significantly lower cost per household in Chittenden County, which represents 69% of the population in the four target regions. A straight average is used for the other figures, as either there was no available data for Chittenden County, or the Chittenden data was within the range of the other districts.

Drop-Off

DSM surveyed solid waste districts throughout Vermont about the cost to residents of solid waste drop-off services for both MSW and recycling and evaluated information reported about these facilities in the SWIPs. DSM’s survey included the same regions as were reported on in the 1999 Report. All municipal, private, and fast trash drop-off locations reported on were included in the findings, which are summarized in Table 3.

Of the 99 drop-off sites reported, the average price per bag was \$2.44, which compared to \$2.13 in 1999, for an increase of 14.5%. Several districts have raised their rates. One reported a lower average rate than in 1999, and the remainder did not report any changes. Separate charges for recycling were only reported in four regions, and in some of these only at private drop-off sites, or only if trash was not also delivered.

The average price for recyclables (where there was a charge) was 92 cents a bag or bin, with the range being 50 cents to \$1.25; however, this is based on very limited responses.

TABLE 3 DROP-OFF PRICES SUMMARY

Region	Price Paid per Bag of MSW Disposed and per Box of Recyclables at Drop-off Centers/Transfer Stations			
	Number of MSW Drop-offs Reported	Average Price per Bag of MSW (1)	Number of Recycling Drop-offs Reported	Average Price per Bin or Bag for Recyclables (2)
Addison County	13	\$2.60	13	(3)
Bennington County	4	\$2.00	3	\$.00
Central Vermont	12	\$3.00	12	\$.00
Chittenden County	8	\$2.75	8	\$.50 if no trash brought in
Greater Upper Valley	6	\$2.92	7	\$.00
Lamoille Region	7	\$2.50	8	\$1.00
Mad River Valley	7	\$3.00	4	\$ 1.25
Northeast Kingdom	11	\$2.00	17	\$.50
Northwest Region	4	\$2.50	4	(4)
Rutland District	15	\$2.25	15	\$1.00 if no trash (private sites only)
Windham County	9	\$1.83	18	\$.00
State Totals	99	NA	111	NA
State Averages	9	\$2.44	10	\$ 0.92 (5)

(1) Some prices are partially subsidized by the municipality. Additional permit or sticker charges are not included in the per bag price.

(2) Most recyclables prices are subsidized by the site owner/operator or included in the cost of MSW disposal.

(3) One community in Addison County charges \$3/ HH for recycling; the other communities do not charge for recycling.

(4) One community has a charge of \$1.50 for two blue bins of recyclables.

(5) This is the average price of locations where a price was reported being charged, not the average price for all drop-off locations in the state.

Commercial Prices

Commercial Solid Waste

DSM obtained results on commercial solid waste collection and disposal prices from hauling companies and generators. A total of 15 hauling companies provided data on prices charged to commercial customers for solid waste, and 13 of these also provided recycling information. A total of 14 commercial generators provided data on the prices they paid for solid waste, and of these, nine provided information on recycling costs.

Data are provided in Table 4 from haulers and generators as well as the average of both prices reported for services in each region. In order to work with a common denominator, DSM asked

haulers for prices charged for weekly collection of non-compacted MSW in different sized containers (typically 2, 4, 6 or 8-cubic-yards), and translated prices into a unit cost per cubic yard. DSM then asked generators what they paid on a monthly basis and the level of service they obtained (container size and service frequency). With this information, DSM was able to calculate an average price per loose cubic yard collected of \$10.15. These prices include container pull charges (also referred to as “haul” or “delivery” charges) and container rental charges.

DSM also gathered information on tip fees charged for roll-off containers of compacted or loose commercial waste that have a per ton disposal charge, as well as container pull and rental charges in each region. Table 4 also illustrates these prices. It is interesting to note that the district surcharges (noted in the footnote and later in Table 7), account for a large extent of the variation in disposal prices per ton.

It should be noted that there are substantial variations in commercial prices charged by individual haulers depending on location, type of containers leased, type and weight of waste, proximity to other generators, length of service, collection fleet available, and the negotiating skills of each company. However, the range of averages reported in Table 4 is relatively small indicating that most businesses throughout the state can receive similar service for similar prices.

TABLE 4 COMMERCIAL SOLID WASTE PRICES SUMMARY

Region	Price per Loose Cubic Yard Collected in Rear or Front Load Trucks (1)			Disposal and Collection Price for Roll-off Containers		Container Rental Fees
	Reported by Hauler	Reported by Business	Average	Disposal Price per Ton (2)	Container Pull Charge (3)	Container Rental / Day (4)
Bennington County	\$ 9.91	\$ 9.26	\$ 9.58	\$ 85.75	\$ 117.33	\$ 2.27
Chittenden County	\$ 8.23	\$ 9.95	\$ 9.09	\$ 98.15	\$ 100.00	\$ 3.13
Upper Valley	\$ 13.09	\$ 11.18	\$ 12.13	\$ 93.50	\$ 125.00	\$ 2.14
Northeast Kingdom	\$ 8.27	\$ 11.32	\$ 9.80	\$ 106.00	\$ 80.00	\$ 3.50
Average Cost in State	\$ 9.88	\$ 10.43	\$ 10.15	\$ 95.85	\$ 105.58	\$ 2.76

(1) In some cases, prices include recycling at no additional cost. In all cases, prices include container rental and delivery.

(2) Includes district surcharges (Bennington, \$0; Chittenden, \$17.61; Upper Valley, \$16.50 and Northeast Kingdom, \$20). Similar prices were reported for both compacted and loose tonnage.

(3) One hauler each in Bennington and GUVSWD included rental in delivery.

(4) Some haulers provide the first week or two weeks of rental at no charge.

Commercial Recycling

DSM averaged prices provided by haulers and businesses to determine the commercial recycling prices in the regions and averaged those prices to develop statewide figures. In some cases, haulers provide recycling services to businesses which use their solid waste services at no additional charge, and in other cases they charge separately for each service. Only separate charges are used in calculations. Also, some businesses did not know the breakdown of their solid waste and recycling prices. Data from this later group of businesses were not relied upon in calculations, while they did provide context for the evaluation.

TABLE 5 COMMERCIAL RECYCLING PRICES

Region	Cardboard (\$/ Cubic Yard)	Office Paper (\$/ 64 Gallon)	Single Stream (\$/ 64 Gallon)
Bennington County	\$5.50	NA	\$4.85
Chittenden County	\$2.96	\$3.96	\$3.23
Upper Valley	\$4.70	\$2.70	NA
Northeast Kingdom	\$0.00 (1)	NA	NA
Statewide Average	\$3.29	\$3.35	\$4.04

(1) One hauler in the Northeast Kingdom provides cardboard recycling at no cost to businesses.

Construction and Demolition Debris Prices

As part of the hauler survey, DSM requested information on the price of C&D collection and disposal. DSM obtained pricing from 12 haulers that provide construction and demolition collection services. Many haulers providing commercial service did not distinguish tonnage fees, pull costs or rental costs for construction and demolition debris, as opposed to other municipal solid waste. However, if the C&D was recycled, it is not subject to the state waste tax of \$6.00 per ton or district surcharges, and tipping fees were often considerably less.

TABLE 6 CONSTRUCTION AND DEMOLITION DEBRIS PRICES

Region	Disposal per Cubic Yard	Disposal per Ton	Pull Charge (2)	Container Rental Charge per Day
Bennington County	\$25.00 (1)	\$ 90.00	\$ 100.00	\$ 3.13
Chittenden County	NA	\$ 98.23	\$ 118.33	\$ 3.75
Upper Valley	NA	\$ 96.00	\$ 80.00	\$ 5.25
Northeast Kingdom	NA	\$ 108.00	\$ 125.00	NA
Average Cost in State	NA	\$ 98.00	\$ 105.83	\$ 4.04

(1) \$30 per yard for heavier materials such as roofing shingles.

(2) One Upper Valley hauler charges \$35 per hour for container delivery or pull; one Chittenden County hauler provides delivery for \$75 an hour.

District Surcharges

As part of the District survey, DSM obtained information on the amount and use of District surcharges. The surcharge is applied to each ton of waste disposed that was generated in any District member municipality and is typically used to pay for any solid waste management services that are not billed directly to the public. This includes: waste prevention, reuse and recycling programs, special waste collections, and unregulated hazardous waste (UHW) management services such as UHW collections and permanent programs. Surcharges also cover the cost of District management and administration. In some Districts, revenues are raised through both the surcharge and through assessments on the member towns' populations.

Table 7 outlines the surcharge in each District as reported by the Districts in 2005. The variation in District surcharges contributes to regional differences in both the cost and level of solid waste management services available in each region. The variation in population in each District also contributes to the surcharge rate. The table is presented to show the impact of district surcharges on solid waste disposal costs and does not represent that the types and level of related solid waste management services are the same in each region.

The average surcharge in 2005 is \$19.87, and the weighted average is \$19.52. This compares to an average surcharge in 1999 of \$16.65, and weighted average of \$16.49, representing increases of 19.3 % and 18.4%, respectively.

TABLE 7 DISTRICT SURCHARGES

District	# of Towns	Estimated Population 2003	TONS SUBJECT TO SURCHARGE (2004)			SURCHARGES (2005)		
			MSW	C&D	TOTAL (4)	Tons/Capita	\$ per Ton	TOTAL
Addison	19	29,993	15,045	6,501	21,546	0.72	\$33.40	\$ 719,636
Central Vermont (1)	20	51,902			43,000	0.98	\$21.00	\$903,000
Chittenden (2)	18	148,978	103,525	42,648	146,173	0.98	\$17.61	\$2,574,107
Upper Valley	10	18,607	7,501	1,919	9,420	0.42	\$16.50	\$ 129,162
Lamoille (3)	12	26,325	12,027	4,396	16,423	0.62	\$16.50	\$ 395,521
Northeast Kingdom	36	31,024	8,665	3,379	14,960	0.48	\$20.00	\$ 299,200
Northwest	13	27,074			17,582	0.65	\$17.00	\$ 298,897
Rutland	16	47,724	32,463	5,285	37,748	0.79	\$16.97	\$ 640,581
Total Subject to surcharges	144	381,627	179,226	64,128	306,852	0.80	\$19.87(5)	\$5,986,373
Total in Vermont	255	619,107						
% Subject to Surcharges	56%	62%						

(1) Central Vermont surcharge will increase to \$21 in July 2005.

(2) Includes some non-district waste.

(3) Lamoille has a lower surcharge for C&D of \$12 per ton, accounting for lower total surcharges collected in that district.

(4) Some districts were not able to provide separate tonnage totals for MSW and C&D.

(5) This figure represents the average surcharge. The total surcharges collected divided by total tons surcharged, or weighted surcharge, equals \$19.52 per ton.

ESTIMATED TOTAL SOLID WASTE COLLECTION AND DISPOSAL COSTS

The residential and commercial price survey findings provide a useful comparison of solid waste management prices, statewide and by region, to prices presented in the 1999 survey, and will serve as a benchmark for future comparisons as well.

DSM used these data to estimate total solid waste and recycling collection and disposal prices for 2005 for planning purposes. DSM has made these estimates based on a number of assumptions and data limitations, which are detailed below. As a result, the actual cost estimates provided in

both Table 8 and Table 9 should be viewed as accurate to within plus or minus 20% of the total estimate presented. Despite this limitation, these total cost estimates do provide a rough, order of magnitude, indicator of total costs to Vermont residents and businesses for managing solid waste and recyclables.

Total Residential Costs

Table 8 presents the estimated annual solid waste collection and disposal costs for the residential sector. The assumptions and data limitations include:

- The percentage of residents using curbside versus drop-off services statewide was not measured. In 1999, DEC obtained estimates from hauling companies that approximately 40% of the population was using curbside collection services, and 60% using drop-off. DSM attempted to verify this split as part of this survey, and believes that in 2005 the ratio is closer to 60% using curbside and 40% using drop-off. The basis for this estimate is a Chittenden County survey which indicated that 72% of residents in the county use curbside collection, as well as other inquiries to more rural districts that indicate about 30% to 40% of households have permits to use drop-off stations. Given the prevalence of fast trash and drop-off locations in some areas, the 60-40 ratio seems most likely.

This change in the estimated split of curbside and drop-off use has a significant impact on estimated total statewide costs because curbside prices are higher than drop-off prices. However, it should be noted that individual transport costs to drop-off facilities were not estimated in either 1999 or 2005.

- Residential waste generation and disposal rates per household, or per capita, in Vermont has not been analyzed. The DEC does collect data on total municipal solid waste generation, which includes commercial and residential waste. Since 1999, total MSW generation has increased 11.5%. In the 1999 report, data from 77 towns in Massachusetts and DSM's best professional judgment were used to develop a per household waste figure. For consistency with the 1999 report, DSM applied an 11.5% increase to the per household figure used in 1999, with the assumption that residential and commercial waste generation have increased at the same rates. Based on these assumptions, DSM has estimated that households dispose of 1887 pounds per year (0.95 tons) of waste, on average.
- Residential drop-off waste disposal costs assume that the average bag of waste disposed weighs 23.5 lbs (estimate provided by the Central Vermont Solid Waste District for 1999 report) and therefore households dispose of an average of 80 bags per year. This equates to an annual cost of \$196.54 per household based on the average price in Vermont of \$2.44 per bag of MSW disposed at drop-off centers.

- Some households (i.e., Burlington and Brattleboro) are on municipal-wide recycling collection service provided by the municipality or a private hauling company under contract to the municipality. In these cases, the average cost per household for solid waste collection is likely to be significantly lower than if solid waste and recycling collection service was provided by subscription haulers. These variations in costs have not been averaged into the total costs shown for curbside service in Table 8.
- A change since the 1999 report is that information for combined recycling and MSW collection was available for all target districts, where as it was only available for one district in 1999. On the other hand, MSW only prices were not available in Chittenden County in 2005 due to the mandatory recycling rule (see Table 2). As this trend is likely to continue, DSM believes that the most useful number for future comparisons will be the combined MSW and recycling cost. However, the statewide average of MSW-only collection is given, based on the three districts with that information available for comparison with 1999 report.
- The costs of other special waste management services, such as the collection and management or disposal of bulky waste, tires, UHW and other hard to handle wastes, have not been included in these total cost estimates. While the surcharges on waste disposal help to pay for some of these services and are included in prices charged for MSW, the total costs of these services are also spread amongst other fees including property taxes, state and federal grants, assessments and direct management and disposal charges to residents and businesses. (A discussion of the prices charged and total costs of recycling follows after Table 8.)

TABLE 8 ESTIMATED ANNUAL COSTS FOR RESIDENTIAL SOLID WASTE AND RECYCLABLES COLLECTION AND DISPOSAL IN VERMONT

Type of Service	Annual Cost/ HH (1)	Estimated Number of HH (2)	Estimated Annual Cost	Annual tons MSW/ HH (3)	Estimated Annual Tons Residential MSW (4)
Curbside MSW and Recycling	\$376.08	147,018	\$55,290,529	0.95	139,078
Drop-off MSW (5) and Recycling	\$196.54	98,012	\$19,263,322	0.95	92,719
Total MSW and Recycling	NA	245,030	\$74,553,851	0.95	231,797

(1) Based on a weighted average charge of \$31.46 per week for curbside (Table 2) and \$2.44 per bag at drop-off locations (Table 3).

(2) Based on 2.52 people per household in 2000 (most recent year available) according to www.housingdata.org and 2003 population of 619,107.

(3) Per capita household waste generation is assumed to be the same for curbside and drop-off households.

(4) Total Vermont commercial and residential disposal in 2003 was 418,035 tons.

(5) Assumes bags weigh 23.5 pounds each and that each bag costs \$2.44.

MSW-Only Costs

As noted above, data was available from three districts on MSW-only collection which averaged \$30.84 per month or \$370.12 per year (Table 2). This compares to the MSW-only cost in 1999 of \$285.00 per year. It should be noted that these MSW-only costs may not be representative of the statewide average. In the case of Upper Valley and the Northeast Kingdom, they are relatively rural areas with low densities, therefore increasing collection costs, and Bennington has relatively high waste transportation costs as they are located further from disposal sites. Also, the haulers that only provide solid waste services tend to be smaller operators that have fewer economies of scale.

Total Recycling Costs

As stated above, the total annual residential costs shown in Table 8 include the costs of recycling services. The survey indicated that the average prices charged for residential recycling services on their own ranged from \$0.50 per bin to \$1.25 per bin at drop-off locations. However, it is impossible to estimate total residential recycling costs for the following reasons:

- The number of residents using curbside and drop-off *recycling* services are difficult to measure. While some of the larger towns and cities, such as Brattleboro and Burlington, offer municipal wide curbside recycling collection, the majority of towns have curbside recycling available only through private hauling companies. The number of households contracting directly with private hauling companies has not been surveyed.
- Quantities recycled by residents versus businesses are also difficult, if not impossible, to measure on a statewide basis. While data on total tons recycled are available by processing facility, there is no way to break out commercial from residential quantities.
- Recycling costs are often subsidized by solid waste collection and disposal costs, or by property or other taxes. While DSM does have data on the amount of MSW surcharges applied to recycling services in each region and the average prices charged to residents, additional costs for recycling collection and processing are hidden in other solid waste management costs and in municipal and state taxes and are difficult to break out.

Total Commercial Costs

Table 9 presents the estimated annual solid waste collection and disposal costs for the commercial sector. The assumptions and data limitations include:

- No Vermont data are available on commercial waste disposal rates. As a result, annual commercial waste disposed has been estimated by subtracting estimated annual residential waste disposal (see Table 8) from total solid waste disposal in calendar year 2003, the most recent year in which statewide data was compiled by the DEC.

- Similar to the residential sector, no breakdown is available on the percent of commercial waste disposed curbside versus drop-off. Therefore DSM is using the same estimate as was used in 1999, which was based on the fact that Vermont has a large number of small businesses (and high percentage of employment in small businesses). With this type of employment, it has been assumed that the commercial sector is using drop-off facilities and paying on a per bag basis for as much as 35% of commercial waste and that perhaps only 20% of commercial waste is collected in compacting roll-off containers at the place of business. The remaining 45% of commercial waste is collected loose in leased containers.
- Prices for commercial waste disposal that were reported on a per cubic-yard basis are based on the size of the container that is leased to the business (i.e. 2, 4 or 8-cubic-yards). The average density of commercial waste in the leased container when picked up must be approximated in order to estimate costs for commercial tons disposed. For example, a business may pay \$160 per month for weekly collection of a four- cubic-yard container (or \$10 per yard) even though the container is typically 75% full when emptied. DSM assumed that commercial curbside waste collected loose averaged 175 lbs/cubic yard paid for to account for the fact that the container may not always be full when it is emptied or pulled.

TABLE 9 ESTIMATED ANNUAL COSTS FOR COMMERCIAL SOLID WASTE COLLECTION AND DISPOSAL IN VERMONT

Type of Service	Estimated % of Commercial Waste	Estimated Tons Disposed (1)	Estimated Price per Ton	Estimated Total Annual Costs
Container Pickup Charge by volume	45%	83,807	\$120.34	\$ 10,085,586
Container pickup Charge by weight	20%	37,248	\$ 95.85	\$ 3,608,547
Drop-off (bags)	35%	65,183	\$ 207.66	\$ 13,535,936
		186,238		\$27,191,704

(1) Total commercial waste estimated for 2003.

Construction & Demolition Debris Costs

DSM did not estimate the total cost of C&D waste collection and disposal for two main reasons. First, no estimates are available on the quantities of C&D collected by private hauling companies versus delivered directly to transfer stations and disposal sites by the contractor in smaller trucks. In addition, the transportation cost to the contractor to deliver C&D waste to the transfer station or disposal site should be included in this estimate and varies greatly depending on the distance and availability of C&D transfer/disposal sites to the job site.

However, DSM can estimate that the total price of **C&D disposal** is around **\$8,678,355**. This is based on an average tip fee of \$98 a ton, and 90,541 tons of C&D reportedly disposed in Vermont in 2001, the most recent year for which the DEC has data.

COMPARISONS WITH OTHER STATES

DSM obtained solid waste and recycling information from state and local solid waste officials in seven other states in the northeast (New Hampshire, New York, Massachusetts, Maine, Connecticut, Rhode Island and Delaware). The data obtained should not be considered to be a comprehensive survey, with the exception of Massachusetts where data was obtained from a majority of municipalities. For other states, it represents findings of a number of municipalities and or the anecdotal observations reported by state officials. In the case of New Hampshire, New York and Massachusetts, communities near the Vermont border were selected to be contacted. In other cases, responses were self-selecting or based on information available to state contacts.

Results presented in Table 10 indicate that, in general, Vermont prices are roughly 25% higher for drop-off and curbside service and tip fees than most of those in comparison states. One likely reason for this higher amount is the surcharges placed on solid waste in Vermont, and the other is that Vermont waste is transported out of state in larger volume than some other rural states, and thus increased transportation charges are included.

TABLE 10 MSW PRICE COMPARISONS BETWEEN VERMONT AND OTHER STATES

State	Drop-off (1)	Curbside (1)	MSW Tip Fees
Vermont	\$1.83 to \$3.00 (\$2.44 / bag average)	\$29 to \$41 (average \$35/ month (weighted average \$31.34 / month)	\$90 to \$108 (\$98 average)
Massachusetts	\$1 to \$2 / bag PAYT	\$2.50/ bag PAYT	\$75 average (municipal contracts)
New Hampshire	\$1 to \$3/ bag	\$22 to \$30 / month	\$38 (municipal) \$62 to \$90 (residential/commercial)
New York	\$2 to \$2.50/ bag	\$16 /month	\$67 to \$80
Connecticut	\$2 to \$3/ bag	\$22 to \$35 / month	\$60 to \$89.50
Maine	\$1 / bag PAYT	\$13 to \$21.50/ month	\$65 to \$85 landfills \$35 to \$158 incinerators
Rhode Island (2)	NA	Providence: municipal cost of \$41/hh/yr; recycling \$15/hh/year	MSW \$6 to \$83 (average \$46)
Delaware	NA	\$22 / month	\$48

(1) In most communities surveyed in the other states, recycling costs were included in MSW drop-off or curbside collection costs.

(2) Recycling tip fees in Rhode Island range from \$38 to \$252 per ton (average \$108)

Sources of Data

The following sources of data were used for Table 10, by state:

New Hampshire: Six communities were interviewed over the phone.

Massachusetts: Franklin County provided results of a 2004 survey of nine communities that have instituted PAYT; state officials provided a database with tonnage costs for recycling and MSW disposal for 240 of 365 communities.

New York: Telephone interviews provided information on six municipalities.

Connecticut: The Connecticut DEP sent an email to municipal recycling contacts and received 19 responses.

Maine: An official from the Maine State Planning Office provided information on statewide tipping fees and select information on municipal and subscription pricing for communities with unit-based pricing, or pay as you throw (PAYT) structures, as well as those with flat fees.

Rhode Island: An official from the Rhode Island Resource Recovery Corporation provided information on statewide pricing and the City of Providence, as well as a summary of a survey conducted of 22 municipalities in 2002.

Delaware: An official from the Delaware Department of Natural Resources and Environmental Conservation provided information based on a NERC survey.