

FITCHBURG, WISCONSIN

Residential Waste Reduction

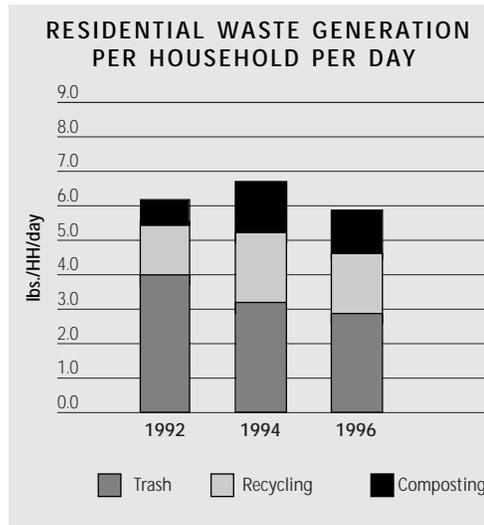
50%

Fitchburg has a long history of innovation in waste reduction programs. The city instituted the first mandatory recycling ordinance and the first multi-family recycling ordinance in Wisconsin and was the first city in the U.S. to implement curbside polystyrene collection.

Fitchburg contracts with Browning Ferris Industries to provide trash collection and disposal, recycling collection, processing and marketing, and curbside collection of non-woody yard debris. The city provides periodic brush collection. In 1996, Fitchburg diverted 50% of its waste from disposal (29% through recycling and 21% through composting).

Fitchburg achieved high waste reduction through recycling of many items, composting, and pay-as-you-throw (PAYT) trash fees. Residents can recycle 21 types of materials; 17 through their weekly curbside collection program; two through monthly collection of reusable goods (household durable items and textiles); one material collected (scrap metal) at drop-off only; and one material (white goods) collected by special appointment. Yard debris collection and drop-off programs accept leaves, grass clippings, and other yard and garden debris. A separate program collects and processes brush. PAYT trash rates serve as an incentive for decreased disposal. Solid waste disposal per household has dropped from four pounds per household in 1992 (before PAYT rates were initiated) to about three pounds per household in 1996.

Drivers for cost-effectiveness of the city's waste reduction programs include low costs associated with composting, inexpensive collection at drop-off sites, and a decrease in waste generation by residents. In 1996, per ton waste reduction costs were \$101. Composting costs were only \$78, well below the \$100 per ton cost of trash collection and disposal. Drop-off recycling collection cost \$7 per ton compared to \$96 per ton for curbside collection; drop-off composting collection (and processing) cost \$15 per ton, curbside collection (and processing), \$117. Per household waste generation dropped 4% from 1992 to 1996, with trash disposal decreasing by a pound per household per day. As a result, Fitchburg disposed of less waste in 1996 than in 1992 despite a nearly 20% growth in households. Fitchburg's net solid waste management budget increased from \$398,000 in 1992 to \$417,000 in 1996 but per household costs decreased from \$126 to \$108 during the same period.



Source: Institute for Local Self-Reliance, 1999.

DEMOGRAPHICS

POPULATION: 16,254 (1992), 17,266 (1996)
HOUSEHOLDS: 6,685 (1990); 3,057 single-family households and duplexes, 3,628 multi-family units. 7,500 (1996); 3,860 units in buildings with 1-4 units
BUSINESSES: 330
LAND AREA: 34.67 sq. miles
HOUSEHOLD DENSITY: 216 households/sq. mi.
AVERAGE PER CAPITA INCOME: \$17,668 (1989)
MEDIAN HOUSEHOLD INCOME: \$35,550 (1989)
COMMUNITY CHARACTER: Small city in the Madison metropolitan area with diverse character. The sections of the city nearest Madison are urbanized, other sections within the city limits are rural farmland. The city maintains an extensive park system, giving the community a rural flavor. Principal employers include Certco, Nicolet Instrument Corp., Promega Corp., Nicolet Biomedical, Inc., Placon Corp., and General Beverage Sales.
COUNTY: Dane

PROGRAM SUMMARY

	1992	1996
Tons Per Year		
Disposal	3,644	4,147
Diversion	2,379	2,079
	1,265	2,068
Percent Diverted	35%	50%
Recycled	24%	29%
Composted	11%	21%
Average lbs./HH/day	6.16	5.89
Disposal	4.02	2.95
Diversion	2.14	2.94
Annual Disposal Fees		
Disposal	\$71,746	\$72,666
Net Program Costs/HH	\$126.48	\$108.12
Disposal Services	\$72.08	\$52.51
Diversion Services	\$54.40	\$55.61

Notes: 3,243 households served in 1992; 3,860 in 1996. 1992 dollars adjusted to 1996 dollars using the GDP deflator. Numbers may not add to total due to rounding.

Source: Institute for Local Self-Reliance, 1999.

RESIDENTIAL WASTE REDUCTION	
	Tons (1996)
Recycled	1,185
Newspaper	434
Glass	211
Magazines	186
Mixed Paper	179
Corrugated Cardboard	74
Scrap Metal ¹	38
Steel/Tin	37
HDPE	36
Aluminum	25
PET	15
Polystyrene	6
Other Plastics	4
Reusable Items ²	NA
White Goods ³	NA
MRF Rejects ⁴	-60
Composted/Chipped	883
Yard Trimmings (Drop-off) ⁵	534
Brush ⁶	186
Yard Trimmings (Curbside Collection) ⁷	163
Total Waste Reduction	2,068
MSW Disposed	2,079
Landfilled	2,019
MRF Rejects	60
Total Generation	4,147
Percent Reduced	49.9%
Lbs. Waste/HH Served/Day	5.89

Note: Figures include only waste handled by Fitchburg's city-sponsored single-family residential waste programs. Waste generated in residences with more than four units and yard debris handled at county sites are not included.

¹Total scrap metal collected was 50 tons. The Project Manager reported some non-residential scrap was collected but conservatively estimated residential scrap as 75% of total.

²Tons not tracked. Fitchburg estimates collection was under two tons.

³Tons not tracked by city or hauler.

⁴Based on average 5% by weight reject rate at MRF.

⁵Estimated tons using 96 10-cubic-yard loads of grass trimmings with an estimated density of 600 pounds per cubic yard and 164 10-cubic-yard truckloads of leaves with an estimated density of 300 pounds per cubic yard.

⁶Fitchburg estimated weight using 99 6-cubic-yard loads of chips produced from material collected, at a density of 625 pounds per cubic yard.

⁷Actual scale weights as reported by BFI.

Source: Institute for Local Self-Reliance, 1999.

State and Local Policies

In 1989, Dane County banned newsprint from its landfill.¹ In 1993, the state modeled its laws on the Dane County ordinance when it banned yard debris from Wisconsin landfills. Effective 1995, all plastic, steel, glass, and aluminum containers; paperboard; polystyrene packaging; corrugated cardboard; newspaper and other paper; and tires were banned from Wisconsin landfills. The state subsequently allowed a temporary exemption for

#3 through #7 type plastics. Communities determined by the Wisconsin Department of Natural Resources to have an “effective recycling program” are exempted from the bans. The state has no recycling goal.

Fitchburg’s Solid Waste and Recycling Ordinance requires all occupants of residential and commercial property in the city to separate recyclables from trash. The ordinance specifies 16 categories of material as recyclable, details proper preparation methods for the materials, requires owners of multi-family dwellings with five or more units to implement a recycling program, and prohibits delivery of recyclables to any disposal facility. The Public Works Director or a designated representative may inspect recyclable materials, trash, collection areas of multi-family residences and businesses, and waste management facilities. The city can levy fines against anyone who delivers materials collected for recycling to a solid waste disposal facility. It can also fine other violators of the ordinance from \$10 to \$1,000. To date, fewer than 10 individuals and no businesses have been fined.

All residents pay an annual base rate for trash, recycling, and yard debris services. The FY97 fee is \$82 per household and covers collection and disposal of up to one 32-gallon trash can per week. Weekly collection of one 64-gallon container costs an extra \$34.68 per year; a 95-gallon container costs \$60.96 extra. Approximately 13% of residents subscribe to service above the base level. Residents with occasional extra trash can use trash tags.² The city annually provides households with ten free trash tags, which can be attached to an extra container of trash. Additional tags (\$1.50 each) are available at local retail stores, the utility district office, or City Hall.

Source Reduction and Reuse Initiatives

After PAYT trash rates began in 1994, per household MSW generation decreased 4% by weight (from 6.16 pounds per household per day in 1994 to 5.89 pounds in 1996.)

Fitchburg encourages residents to compost at home. The city sold approximately 400 composting bins at a reduced price in 1996 and another 50 in 1997. The city also encourages residents to use mulching mowers through publication of articles about mulching mowers and their benefits in its recycling newsletter.

CURBSIDE COLLECTION OF RECYCLABLES

Service Provider:	BFI
Start-up Date:	Voluntary recycling began 1987, mandatory program with weekly collection began 1988
Mandatory:	Yes, effective 1988. Requirement includes all materials collected at curbside except household durable goods.
Households Served:	3,860, all units in buildings with four or fewer residences
Materials Accepted:	Glass bottles and jars, steel and aluminum cans, all plastic containers, #4 plastic container lids, rigid and foam polystyrene, newspapers, white paper, mail, magazines, paperboard, phone books, brown paper bags, corrugated cardboard, reusable household items (e.g., clothing, books, small appliances, housewares, and toys), and white goods. Reusable items must fit into a 32-gallon clear plastic bag and be in reusable condition.
Collection Frequency:	Weekly, same day as trash. White goods collected by appointment on Thursdays for a \$35 fee. Reusable items once monthly on special collection days.
Set-out Method:	Yellow and green stackable 12-gallon bins. Commingled containers and bagged polystyrene foam in the yellow bin, newspaper in the dark green bin, mixed paper in a kraft bag beside bins, and flattened corrugated cardboard placed under the bins. Even if they only have cardboard for recycling on a particular week, residents are asked to place the material in or under a bin so the material will be noticed by collection crews. Reusable items in clear plastic bags. Additional recycling bins can be used for extra commingled containers or newspapers.
Collection Method:	Single-person crew collects material into a two-compartment 38-cubic-yard side-loading LaBrie truck with an adjustable divider. Durable goods are collected separately by a single-person crew using a pick-up truck. Single-person crew using a flat-bed truck with boom collects appliances.
Participation Rate:	98% from consultant study reflecting data collected in 1996
Participation Incentives:	Reduced trash fees through decreased disposal, potential fines for non-compliance with mandatory participation requirements
Enforcement:	Mandatory program with potential fines up to \$1,000 for non-compliance. Fewer than 10 individuals have received fines for failure to recycle. Collection crews leave unacceptable materials and contaminated recyclables in the recycling bin with a card explaining why they did not collect materials.

CURBSIDE COLLECTION OF YARD TRIMMINGS

Start-up Date:	1989
Service Provider:	Public Works collects brush, BFI collects other yard debris
Households Served:	3,994 for yard debris collection, 7,500 for brush collection
Mandatory:	Yes
Materials Collected:	Leaves, grass clippings, brush, and other yard debris, and holiday trees
Collection Frequency:	Four times yearly for yard debris (once in each of April, May, October, and November) and eight times yearly for brush and holiday tree collection (once in each of January, April, May, June, August, September, October, and November)
Set-out Method:	Yard debris in bags or cans, brush bundled, bare holiday trees (not bundled or cut)
Collection Method:	Single-person crew collects yard debris into a 25-cubic-yard manual rear-load packer truck. Two-person crews collect and chip brush using a Ford F350 truck with service body pulling a Vermeer chipper.
Participation Rate:	NA
Participation Incentives:	Reduced trash fees through decreased disposal, potential fines for non-compliance with mandatory participation requirements, yard debris not collected if mixed with trash or set out for trash collection
Enforcement:	Potential fines for failure to comply with ordinance, fines have been issued for piles of unbundled brush in public view

DROP-OFF COLLECTION

Number of sites:	Fitchburg operates a drop-off site at City Hall. Two county sites are also conveniently located for Fitchburg residents.
Staffing:	None
Service Provider:	Department of Public Works
Materials Accepted:	Leaves, grass clippings, fruits, flowers, vegetables and other yard and garden debris; mixed paper including mail, corrugated cardboard, newspaper, paperboard, kraft paper bags, office paper, and magazines; and scrap metal
Participation Incentives:	Reduced trash fees through decreased disposal
Sectors Served:	All sectors (note: commercial/institutional materials are excluded from Fitchburg's 50% diversion level)

EQUIPMENT COSTS			
Item	Costs	Use	Year Incurred
New Holland 675 Spreader ^{1,2}	\$900	Composting	1997
Case 1840 Skid Steer Loader	\$17,884	Composting	1996
400 Composting Bins ³	\$13,069	Home Composting	1996
Ford Explorer	\$20,051	Recycling/Composting	1996
Case 821B Loader	\$127,700	Composting	1995
Ford F150 Truck ⁴	\$13,541	Recycling/Composting	1993
Ford F350 Truck with Service Body	\$28,517	Composting	1991
International Dump Truck ⁵	\$64,382	Recycling	1991
Vermeer Chipper	\$14,708	Composting	1990
9,000 Recycling Bins ⁶	\$45,405	Recycling	1987
John Deere Skid Steer Loader ^{1,4}	\$6,500	Composting	1985
Case 440 Tractor ⁷	\$4,000	Composting	1965

Notes: Unless otherwise noted, equipment purchased out of capital funds.
¹Purchased used.
²Purchased out of operating budget.
³Purchased out of operating budget. The city sold the bins at a 20% subsidy, recovering 80% of this expenditure.
⁴Retired 1996.
⁵Used for composting until 1997, currently used only occasionally in recycling program.
⁶Purchased from state loan funds.
⁷City contact estimated purchase price and date. Before compost program was started, tractor was in storage.

Source: Institute for Local Self-Reliance, 1999.

BFI collects reusable household items at curbside. Once a month, the hauler collects clothing, toys, books, tools, linens, small appliances, housewares, and any other reusable household item residents place at the curb in clear plastic bags on their regular recycling day. BFI donates all collected items to the St. Vincent DePaul Society charity. Fitchburg supports reuse of items not collected at curbside, such as appliances, furniture, or anything else that will not fit into a 30-gallon bag, by providing residents information on charities that do accept the items.

Recycling Program

In 1996, Fitchburg recycled 29% of its residential waste. The city provides two color-coded stackable recycling bins to all new homes. Residents can purchase additional or replacement bins for \$7.50 each.

Fitchburg contracts with BFI to provide residential curbside recycling. BFI delivers

collected materials to Green Valley in Waunakee, Wisconsin, (25 miles from Fitchburg) for processing and marketing. At Green Valley, staff sort paper manually. Magnets and eddy currents remove steel and aluminum from commingled recyclables. Remaining materials are sorted manually. The reject rate at the MRF is 5% by weight. Under its BFI contract, the city would receive 80% of revenues.³

Fitchburg does not provide solid waste services for apartment buildings with five or more units. Building owners must contract privately for trash and recycling services. Local ordinance requires residents of apartments to recycle the same materials as residents of single-family homes.

Composting Program

In 1996, Fitchburg composted 21% of its residential waste stream. The city contracts with BFI to provide curbside leaf, grass clipping, and other non-woody yard debris collection four times a year. BFI delivers yard debris to the Columbia County mixed waste composting facility (50 miles from Fitchburg). Composting facility staff compost yard debris with mixed trash in an in-vessel composter. Finished material is land spread on area farms.

Residents can deliver non-woody yard debris to a drop-off center located at Fitchburg City Hall. City staff remove contaminants and land spread it.⁴



BFI uses a 38-cubic-yard split side-loading truck to collect recyclables.

The city provides curbside brush collection seven or eight times a year to all Fitchburg residents (including those in multi-family dwellings). Two- or three-person crews using pick-up trucks and tow-behind chippers collect and chip the material. The chips are given away to residents.

Education, Publicity, and Outreach

The centerpiece of Fitchburg's outreach is the "Fitchburg Recycling Update," a newsletter

published three or four times a year. The newsletter contains information about collection programs, changes in program hours, collection methods, and materials accepted. Every household served by the city's solid waste programs receives the newsletter.

When PAYT trash rates began, Fitchburg produced and direct-mailed a "Homeowner's Guide to Solid Waste Disposal."

The DPW Project Manager performs waste assessments for businesses and institutions and gives

WASTE REDUCTION COSTS (1996)				
	Cost	Tons	Cost/Ton	Cost/HH/YR
Recycling Gross Costs	\$146,096	1,246	\$117.28	\$37.85
Curbside Collection and Processing ¹	\$98,978	1,030	\$96.13	
Drop-off Collection ²	\$1,449	216	\$6.70	
Drop-off Processing and Hauling ³	\$355	1,246	\$0.29	
Administration/Enforcement/Depreciation ⁴	\$33,581	1,246	\$26.96	
Education/Publicity ⁵	\$11,733	1,246	\$9.42	
Composting Gross Costs	\$68,564	883	\$77.69	\$17.76
Curbside Collection and Processing ⁶	\$40,900	349	\$117.36	
Drop-off Collection and Processing ⁷	\$8,216	534	\$15.38	
Administration/Enforcement/Depreciation ⁴	\$16,637	883	\$18.85	
Education/Publicity ⁵	\$2,811	883	\$3.19	
Waste Reduction Gross Costs	\$214,660	2,128	\$100.86	\$55.61
Materials Revenues	(\$0)	2,128	(\$0)	(\$0)
Net Waste Reduction Costs	\$214,660	2,128	\$100.86	\$55.61

Note: Tonnages do not correspond with those on the table on page 96, as they represent materials collected and include MRF rejects. Figures may not total due to rounding. Figures above include depreciation on equipment and limited overhead and administrative costs within the Department of Public Works. Overhead/administrative costs above the Department level are not included. Source reduction education and publicity costs are not separable from recycling and composting costs and are included in those line items. Numbers may not add to total due to rounding.

¹Represents contract costs with BFI for weekly curbside collection and processing, and staff costs for Fitchburg Project Manager.
²Represents salaries and benefits for Fitchburg staff at drop-off site.
³Represents salaries and benefits for Fitchburg staff.
⁴Includes salaries, benefits, office supplies, consulting services, equipment depreciation, and staff travel and training costs.
⁵Includes salaries, benefits, printing costs, and office supplies.
⁶Represents contract costs for collection services performed by BFI, staff salaries and benefits, and equipment costs for city collection and processing.
⁷Represents staff salaries and benefits, and equipment costs for drop-off collection and processing of collected material.

TOTAL SOLID WASTE MANAGEMENT COSTS (1996)				
	Cost	Tons	Cost/Ton	Cost/HH/YR
Disposal Gross Costs¹	\$202,701	2,019	\$100.42	\$52.51
Trash Collection	\$130,035	2,019	\$64.42	
Landfill Tip Fees ²	\$72,666	2,019	\$36.00	
Administration/Enforcement ³	NA	2,019	NA	
Education/Publicity ⁴	NA	2,019	NA	
Waste Reduction Gross Costs	\$214,660	2,128	\$100.86	\$55.61
SWM Gross Costs	\$417,361	4,147	\$100.65	\$108.12
Materials Revenues	(\$0)	2,128	(\$0)	(\$0)
Total SWM Net Costs	\$417,361	4,147	\$100.65	\$108.12

Note: Disposal tonnages do not correspond with those on the table on page 96, as they represent materials collected and exclude MRF rejects. Numbers may not total due to rounding. Figures above include equipment depreciation. Overhead/administrative costs above the DPW level are not included.

¹Contract payment to BFI totaled \$202,701 and includes collection and tip fees for disposal.
²Costs reflect tip fee at Dane County Landfill, which is 12 miles away.
³Very little Fitchburg staff time is spent overseeing trash program. All staff time spent on waste programs is included in waste reduction costs above.
⁴Trash education and publicity not separable from waste reduction education activities and are included in those figures.



Source: Institute for Local Self-Reliance, 1999.

presentations to schools and civic organizations about waste management.

Fitchburg also promotes its programs via videos shown on cable TV and press releases distributed to local radio, television, and print media.

Costs

In 1996, the city spent about \$417,000 for trash, recycling, and yard debris services — about \$108 per household served. Of this, about 49% was spent on trash collection and disposal, 35% on recycling, and 16% on yard debris collection and recovery.

On a per-ton basis, trash cost \$100 and waste reduction cost \$101 (recycling cost \$117 per ton and yard debris recovery, \$78). The largest components of the 1996 budget were contract costs (79%) and personnel costs (11%).

The DPW's budget rose during the last decade; so did the population and number of households served. When the cost of inflation is taken into account, average per household costs for waste management services have decreased from \$126 in 1992 to \$108 in 1996. During this same period, landfill tip fees increased 17% in real dollars.

Funding & Accounting Systems

Residents pay an annual fee of \$82, assessed on property tax bills, to fund solid waste management services. Subscribers of trash service levels above the base service level of one 32-gallon trash can per week must pay additional fees. Recycling and yard debris services are also funded through state grants. The solid waste management fees and grants are maintained in an enterprise fund. Enterprise fund expenditures are tracked using accrual accounting.

Future Plans and Obstacles to Increasing Diversion

The Project Manager believes the city is collecting everything that can be cost-effectively collected, processed, and marketed. To increase its diversion rate among the homes served, the city must increase recovery of the materials it already collects.

As of late 1997, Fitchburg was engaged in a comprehensive waste planning process. If state funding expires, the city will need to replace these revenues with increased fees or decreased costs and is currently considering options to maintain a positive balance in its enterprise fund over the long term.

Tips for Replication

Listen to your line employees. Workers know the system and its strengths and weaknesses. For example, a Fitchburg staff member and farmer suggested using a manure spreader to land spread yard debris from the city's drop-off site. Doing so saves both time and money.

Get your hands dirty. Management can sometimes gain insight concerning problems and opportunities by working on collection routes and poking around in containers.

Don't reinvent the wheel. Talk with other recyclers when faced with problems. Most likely someone else has encountered a similar problem and can offer advice.

Optimize. Never stop striving to improve; there's always room for improvement.

Notes:

- ¹Ferrous metal cans, aluminum cans, OCC, glass bottles and jars, HDPE plastic bottles and tubs, PET plastic bottles, large appliances, used oil, grass clippings, leaves, brush, tires, and lead-acid batteries were banned in 1991.
- ²By appointment, Fitchburg's trash hauler, BFI, will also collect large amounts of trash at the rate of \$10 per cubic yard, appliances for \$35 each, and all pieces of furniture that weigh more than 20 pounds for \$10 each.
- ³In 1995 and 1996, BFI received no revenue from Fitchburg recyclables. The Project Manager believes the company's deal with the processor grants them a reduced tip fee rather than a share of revenue from sales.
- ⁴Fitchburg owns 27 acres of land surrounding the City Hall. City staff land spread the yard debris on about five acres of this land.

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