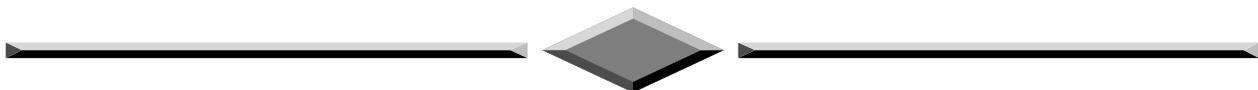
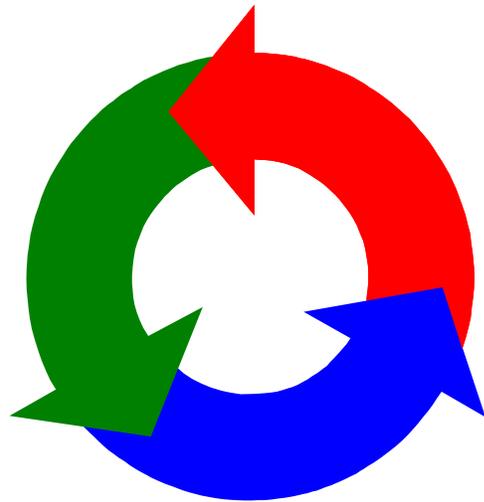
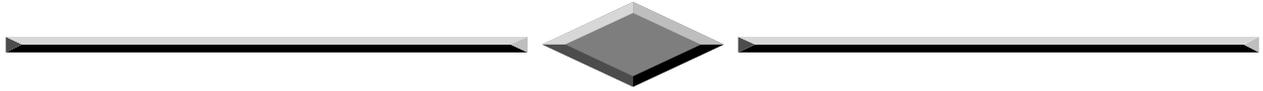


NASHUA REGIONAL PLANNING COMMISSION

REGIONAL RECYCLING PLAN

OCTOBER 2000





RECYCLING PLAN FOR THE NASHUA REGION

Prepared by the



NASHUA REGIONAL PLANNING COMMISSION

October 2000

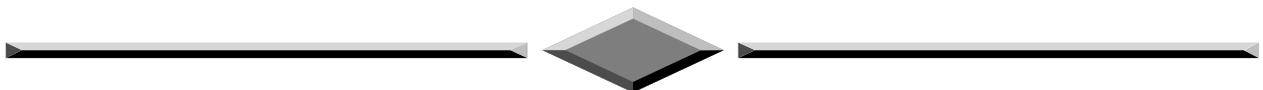




TABLE OF CONTENTS

INTRODUCTION 1
 Introduction and Overview of Prior Recycling Efforts 1

CHAPTER I: CURRENT DISPOSAL AND COLLECTION PRACTICES 2
 City of Nashua 2
 Town of Merrimack..... 4
 Souhegan Regional Landfill and Transfer Stations..... 5
 Town of Amherst..... 5
 Town of Hollis..... 6
 Town of Brookline 6
 Town of Mont Vernon..... 6
 Town of Hudson..... 6
 Town of Milford..... 7
 Town of Windham..... 8

CHAPTER II: WASTE GENERATION 11
 Waste Volumes 11
 Population Projections 12
 Generation Rates..... 12
 Waste Composition 13
 Projected Waste Volume..... 15
 Conclusion..... 16

CHAPTER III: MARKET EVALUATION AND DISPOSAL METHODS..... 17
 Paper Products 17
 Glass Product Containers 19
 Plastic Product Containers 20
 Metals and White Goods 22
 Compost..... 23
 Tires 26
 Batteries..... 28
 Used Motor Oil 30
 Propane Tanks..... 32
 Computers and Electronics 33
 Textiles 33
 Construction Materials..... 34
 Household Hazardous Waste 36



TABLE OF CONTENTS (continued)

CHAPTER IV: RECYCLING FACILITIES AND CAPITAL COSTS 40

 Souhegan Regional Landfill District 40

 Town of Merrimack..... 41

 Town of Milford..... 42

 City of Nashua 43

 Town of Windham..... 44

 Outside the Nashua Region Solid Waste Management District..... 45

CHAPTER V: ADVERTISING, MARKETING AND PUBLIC RELATIONS..... 49

CHAPTER VI: IMPLEMENTATION ALTERNATIVES AND ISSUES..... 52

 Waste Reduction Goal..... 52

 Regional Recycling Alternatives..... 53

 Residential Recovery Techniques..... 54

 Commercial and Industrial Recycling 57

 Mandatory vs. Voluntary 58

 Education/Public Awareness 58

 Pay-As-You-Throw Trash Disposal 59

 Composting 60

 Local, State and Federal Regulatory Barriers..... 61

 Conclusion 61

CHAPTER VII: CONCLUSIONS AND RECOMMENDATIONS..... 63

 Recommendations for the Entire District 64

 Recommendations for the Souhegan Region Landfill District 65

 Recommendations for Merrimack..... 66

 Recommendations for Milford..... 66

 Recommendations for Hudson..... 67

 Recommendations for Nashua..... 68

 Recommendations for Windham..... 68

APPENDIX — MAPS

 Nashua Regional Solid Waste Management District

 Location of Solid Waste Disposal Facilities in the N.R.S.W.M.D.



LIST OF TABLES

I-1	Collection Practices of Other Communities.....	9
II-1	1998 Waste Volumes by Town.....	11
II-2	2000 - 2020 Population Projections, Nashua Region Solid Waste Management District.....	12
II-3	Estimates of Solid Waste Volume and Generation Rates.....	13
II-4	Projections of Materials Generated for the U.S. in the Municipal Waste Stream.....	14
II-5	Solid Waste Projections	16
III-1	Paper Products.....	18
III-2	Glass Containers.....	20
III-3	Plastic Containers.....	21
III-4	Metals and White Goods.....	22
III-5	Compost.....	25
III-6	Tires.....	27
III-7	Automotive Batteries	30
III-8	Used Motor Oil.....	31
III-9	Propane Tanks	32
III-10	Textiles.....	33
III-11	Construction and Demolition	35
III-12	Yearly Participation Rates.....	38
IV-1	Souhegan Regional Landfill District — Recycling Facilities	40
IV-2	Merrimack Recycling Facilities.....	41
IV-3	Milford Recycling Facilities	42
IV-4	Nashua Recycling Facilities	43
IV-5	Windham Recycling Facilities	44
IV-6	Pelham Recycling Facilities.....	45
IV-7	Walpole Recycling Facilities	46
IV-8	Other New Hampshire Communities	47
IV-9	Burlington Vermont.....	47
V-1	Advertising, Household Hazardous Waste/Small Quantity Generator.....	49
V-2	Current Advertising for Recycling.....	51



INTRODUCTION

INTRODUCTION AND OVERVIEW OF PRIOR RECYCLING EFFORTS

The Nashua Region Solid Waste Management District (District) was established in 1983 in response to a mandate from the New Hampshire General Court (RSA Chapter 149-M) requiring all municipalities to form Solid Waste Districts. The District is composed of eight municipalities in the Nashua Regional Planning Commission (NRPC). This includes the towns of Amherst, Brookline, Hollis, Hudson, Milford, Merrimack, the City of Nashua, and Mont Vernon, as well as Windham — which, although outside the NRPC region, was assigned to the District by the New Hampshire Bureau of Solid Waste Management. In 1998, the population of the District was estimated by the Office of State Planning to be just over 174,000. The projected population figures for the years 2000, 2005, and 2010 are: 180,343, 191,856, and 199,679.

The Nashua Regional Planning Commission has provided ongoing assistance to the District since 1983, both administratively, and in planning efforts required by the State. In 1989 the District's first Solid Waste Plan was completed, which recommended that every municipality set up a recycling program. Since that time Milford and Windham have initiated mandatory recycling, and the rest of the District encourages voluntary participation.

With the exception of the incinerator in Windham, all of the municipalities in the District dispose of their solid waste primarily in sanitary landfills. Rochester and Penacook, NH have the two largest facilities. The Town of Merrimack and the City of Nashua have the two remaining landfills in operation. Problems associated with the siting of new landfills promoted the identification of waste-to-energy resource recovery as the safest, most economical option available to the District in the 1985 Study. The feasibility study was completed but a resource recovery facility was never pursued. A combination of waste reduction methods is currently being used in the District. Recycling, composting, and household hazardous waste collection reduce waste volumes that would otherwise be landfilled.

Chapter I consists of a review of practices and materials accepted by all member communities and comparable size communities in the State and New England. Chapter II examines the waste generation by community within the District. Market evaluations and disposal methods for recyclable materials are discussed in Chapter III. Chapter IV reviews the recycling facilities and their capital costs. A review of advertising, marketing, and public relations is found in Chapter V. Implementation alternatives and issues for the District are examined in Chapter VI, followed by future recommendations for the District.



Chapter I

Current Disposal and Collection Practices

The ability to dispose of solid waste locally has declined, with the remaining landfill space rapidly diminishing or slated for permanent closure. Since 1974, landfills in Amherst (1988), Brookline (1975), Hollis (1974), Hudson (1985), and Mont Vernon (1990), have been closed. Merrimack's landfill is slated to close by 2001 because it is unlined and sufficient acreage does not exist to permit expansion of the facility. Nashua's existing unlined landfill will begin closure this year and a new lined cell will open in 2001. Windham's incineration facility surpassed capacity and was not replaced.

Sanitary landfills are no longer the primary disposal option for most of the communities due to increasing land prices, new siting regulations, and changes in state policy. Although the District does not have regulatory or legal powers, the District is still responsible for monitoring and disposal of leachates from the closed landfills. The 1989 Recycling Plan recommended that the District investigate the feasibility of creating a waste-to-energy facility within the District. A feasibility study was completed but was never acted upon. The second major recommendation was to increase recycling due to the lack of disposal options and increasing costs to transport waste out of the District. All of the communities now have recycling programs. The remainder of this chapter will provide a summary of current disposal and collection practices for recyclable materials and composting on a town-by-town basis.

City of Nashua

The Solid Waste Department of the Division of Public Works operates the City of Nashua's Four Hills Landfill for Nashua residents, businesses, and institutions. The Department also provides curbside collection of most residential trash, seasonal soft yard wastes, bulky items, and recycling. The Solid Waste Department operates the Nashua Recycling Center at the Landfill and hosts a monthly regional hazardous waste collection from spring through fall at the Public Works Garage on Riverside Terrace.

Four Hills Landfill

The Four Hills Landfill, located on a 300-acre site at 840 West Hollis Street, has been open since 1970. The facility handles more than 100,000 tons each year of Nashua's residential and commercial municipal solid waste (MSW). The facility also accepts construction and demolition debris, asbestos from buildings in the City and sludge from the wastewater treatment facility. Leachate from the site is discharged into the wastewater system.



A public-private partnership developed a landfill gas-to-energy system, which generates and sells electricity from the methane produced in the landfill. The system will be integrated into the new landfill. A low-tech composting operation onsite annually processes 4,000 tons of soft yard wastes into humus that is used on the site.

A major three-phase construction project for a lined landfill is currently underway to extend capacity at the facility for 20 plus years. Phase one is expected to be ready for use in 2001. Closure of the existing 57-acre unlined landfill will begin this year.

Nashua Recycling Center

The Nashua Recycling Center at the Four Hills Landfill has evolved from the drop-off center that was opened in 1988 to a recently installed (12/99) baler processing system for paper, plastic, and metal containers that has expanded marketing options for these materials. The recyclable materials collected during regularly scheduled pick-ups are sorted curbside and the stored in segregated containers at the Center. The Center accepts glass, metals, papers (newspapers, cardboard, and mixed paper from schools), some plastic containers (PET, #1 and HDPE #2), textiles, yard wastes, used motor oil, and motor vehicle batteries.

Hazardous Waste

The Nashua Regional Household Hazardous Waste/Small Quantity Generator Waste Collection Center is a cooperative effort of the Division of Public Works, the Solid Waste Department, and Nashua Region Solid Waste Management District under the aegis of the Nashua Regional Planning Commission. The Center serves the residents and qualified small businesses of area communities for the proper disposal of hazardous wastes. This was the first permanent site in the State for household hazardous waste and the only facility to date to allow businesses that qualify as Small Quantity Generators to participate in the collections. The Center is located at the Nashua Public Works Garage on Riverside Street. Safety-Kleen is the designated operator and qualified hazardous materials vendor. Regular collection events are scheduled on the first Saturday each month from April through November. The facility also serves as a temporary emergency storage for regional HAZMAT incidents.



Town of Merrimack

The Town of Merrimack owns and operates a municipal solid waste landfill located on a 138-acre parcel off Lawrence Road in the northwest corner of the town. The landfill itself occupies approximately 26 acres and has been in operation for over 25 years. Also located on this property is a small area formerly used for landfilling known as the "Winter Dump", two areas used for storage of composted secondary wastewater treatment sludge, and a recycling center.

Residential waste brought in by individuals is compacted on the site and commercially hauled waste is brought in already compacted. No municipal pick-up is provided. In addition to general refuse and recyclables, the facility accepts separated bulky or scrap metals, demolition debris, waste oil, anti-freeze, tires and batteries. Bulky metals are marketed through the New Hampshire Resource Recovery Association.

The landfill was constructed on a bedrock ridge to minimize groundwater contamination. Refuse has been placed close to or directly on the bedrock. Landfill operations consist of daily cell construction with soil cover. Minimal lateral expansion is occurring, being ultimately constrained on the east and west by two small brooks, and on the north and south by the property boundaries. A Ground Water Management Zone (GMZ) was established as a requirement of the landfill permit issued by the Department of Environmental Services. There are currently 25 monitoring wells within the GMZ. A closure plan for the landfill is currently in progress and the landfill is slated for permanent closure in 2002. There are no definitive plans for the site but there will have to be some major reorganization to accommodate new trash compactors for household garbage and construction and demolition debris since the material will now have to be disposed of at other facilities. Stumps and logs will continue to be buried. The "Winter Dump" is currently being prepared for capping. The material is being consolidated away from the brook and covered with sand and gravel. The geotextile covering will be complete in the fall of 2000.

In order to lengthen the life of the landfill, Merrimack opened a voluntary drop-off recycling center in 1990. A 10,000 square foot drive through facility was opened in 1991. Residents place materials in containers on the upper level or use the chutes to the containers on the lower level. The containers are rotated and the products are either crushed or baled. There is minimal sorting needed by facility personnel. Vehicle counts at the recycling center indicate that participation rates are high. The program is voluntary, however, and private waste collection in Merrimack is commonplace.

The recycling center accepts the three colors of glass; PETE and HDPE plastic beverage containers; newsprint, corrugated and office paper and magazines; aluminum cans and tin/steel cans. Unlike other facilities in the state, glass is not separated by color since it used as cover on the landfill. There is a section devoted to books and other swap items. The heating system for the building is fueled by waste oil.

Merrimack has been aggressively composting sludge and yard wastes for a number of years. The town uses wood chips as a bulking agent for the sludge at the Waste Water Treatment Plant. The compost is free to residents. The Town has successfully been marketing its compost throughout New England.



Souhegan Regional Landfill and Transfer Stations

The Souhegan Regional Landfill District (SRLD) is composed of the towns of Amherst, Brookline, Hollis and Mont Vernon. The refuse disposal district was originally organized around a regional landfill located on 10-acre site in Amherst. The landfill closed in 1988 when expansion plans for the facility were denied by the state. Faced with the loss of their local disposal facility and soaring costs, the SRLD towns jointly contracted with a private vendor for a co-mingled, drop-off recycling program in 1989. The SRLD towns now utilize the waste-to-energy incinerator in Penacook, NH for non-recyclables. The former landfill site now serves as a transfer station and recycling center for the Town of Amherst.

In 1998 the tanks that collected leachate from the lined portion of the landfill were closed off and filled due to concerns about the tanks' integrity. Currently, the SRLD is pumping leachate directly out of the landfill. Groundwater monitoring continues on the landfill and on the wetland down gradient from the landfill across Route 101. In 1999 a Ground Water Management Zone (GMZ) was established as a requirement of the landfill permit issued by the Department of Environmental Services. Only a portion of the 38.7-acre wetland is in the GMZ but because of the presence of heavy metals the SRLD had to purchase the entire property.

Although collected in the District, the SRLD is not responsible for the disposition of scrap metal, white goods, construction and demolition materials, batteries, tires, oil, and yard wastes. The costs and revenues associated with these materials accrue to each town and are not part of the SRLD budget. The current program contracts with Northeast Resource Recovery (NRRRA) for the marketing of metal, paper (mixed), co-mingled containers, and construction debris. Occasionally the NRRRA will market tires and automotive batteries for the District. The SRLD only accepts residential construction debris. The SRLD owns all of the roll-off trash compactors. A description of the facilities provided in each of the other SRLD towns is provided below.

Town of Amherst

As mentioned above, Amherst utilizes the former SRLD landfill site off Route 101 East for its transfer station and recycling center. The voluntary town-wide recycling program was initiated in 1991 and has removed between 20 and 24 percent of the waste volume by weight since that time. Amherst residents bring their wastes and recyclables directly to the site. At the transfer station, waste is dumped by residents directly into dumpsters. It is then compacted and delivered to the Penacook landfill. The transport and maintenance of the dumpsters is contracted out to private haulers. Municipal trash pick-up is not provided in Amherst but residents are served by private waste collection services. Yard waste is composted at the rear of the site. All brush and clean wood scraps are burned.



Town of Hollis

In Hollis, residents take the majority of household trash to the transfer station/recycling center on Rocky Pond Road. The site, formerly the town dump, is leased by the Town. The facility has operated as a transfer station since 1974. Hollis, as part of the SRLD, contracts with a private firm for the removal and marketing of recyclables. Construction debris, stumps and brush are accepted at the stump dump on Depot Road. Materials from the Depot Road site are transported to the Wood Recycling, Inc., facility in Peabody, Mass. Waste oil is collected at the transfer station and marketed to a local farmer for fuel oil. The town accepts tires, wet cell batteries, and scrap metal, which it markets individually. A compost pile is also maintained at the Rocky Pond site.

Town of Brookline

Trash has not been dumped at the Brookline landfill for approximately 18 years. The 35- acre site on North Mason Road currently serves as a transfer station and recycling center consistent with the other SRLD towns. In Brookline, volunteer recycling began in 1989. Stumps and demolition debris were buried at the site through 1999. The stumps and C & D is now separated from the burn pile to assess the volume generated by the town. Waste oil, tires, scrap metal and wet cell batteries are also accepted and marketed to various vendors. All other non-recyclables are hauled to the waste-to-energy facility in Penacook.

The Brookline transfer station site measures about an acre and will have to be capped. The Town began Phase I of a Closure Plan in 1989. Phase I determined the perimeter and depth of the old landfill. Monitoring wells have been in place since 1987 and water samples are checked quarterly. Starting in 1992, the town went to semi-annual monitoring.

Town of Mont Vernon

Mont Vernon residents bring their trash to the Town transfer station/recycling center located on Kendall Hill Road. Here, non-recyclable waste is dumped directly into trailers, compacted and then delivered to the Penacook facility. Mont Vernon participates in the same contractual arrangements as other SRLD towns and accepts and markets materials under similar arrangements.

Town of Hudson

The Town of Hudson closed its landfill in 1985 due to serious leachate problems. The site is located in a floodplain and is primarily composed of soils that are found in marshes and the water table is at or on the surface throughout most of the year. After some controversy, the landfill was officially closed and capped in 1991 at a cost of \$2.3 million.

Hudson was the first community in the District to offer curbside recycling. Begun in 1988, the program encourages residents to place co-mingled recyclables (glass, newsprint and aluminum cans, plastics and tin/steel cans) into a single bin for collection. Residential waste and recyclables are collected door-to-door currently under a contract with Browning-Ferris Industries, Inc. (BFI). Curbside pickup is once a week and white goods and bulky items are picked during the last week of the month. Once a month there is a Town cleanup where residents can bring metal, leaf/yard waste, and construction/demolition materials. BFI keeps the revenue generated from the sale of the metals. All commercial waste is transported directly by private contractors. Residents have to take wet cell batteries directly to Wal*Mart or other auto part facilities. Hudson is the only town that is allowed to bring waste oil to the Household Hazardous Waste collections until a used oil program is established.

Town of Milford

The Town of Milford operates a transfer station and recycling center on a ten acre, town owned site at 76 North River Road. The transfer station was developed on the site of the Town's former landfill in 1980. Residents and commercial haulers bring wastes directly to the site. Approximately 75% of the non-recyclables are placed into a trailer, which is then hauled to the Maine Energy Recovery Corporation in Biddeford, Maine. The remaining 25% is transported by contracted services to available landfills. No municipal pick-up is provided in Milford. However, private haulers are used extensively by residents and businesses. Due to cost, the town's mandatory recycling requirement, and the physical logistics of the site, many private haulers of residential and nonresidential waste apparently find it more advantageous to dispose of waste at alternative facilities.

Milford's recycling program has gone through substantial changes in the past few years. In an effort to reduce disposal costs, the Town of Milford contracted with a private recycling contractor in early 1989. The recycling program operated similarly to the program selected by the Souhegan District towns. Commingled recyclables, including newsprint, office paper, corrugated, all colors of glass, plastics, scrap metal, and aluminum cans were accepted at a drop-off facility at the transfer station. The contractor received a set, per ton fee and was responsible for transporting and marketing the materials. In 1990, the recycling center became a regional facility also serving the Town of Derry. However, the facility is at capacity and only serves the town of Milford. The existing building was expanded to include a variable speed conveyor, a baler specifically designed for plastic bottles and a flattener/perforator for plastics.

Although notable achievements were accomplished at the facility, several operational and contractual problems also surfaced. In 1992, the Town bought out the private contractor and now operates its own recycling center. Currently, the facility accepts a wide variety of recyclables as well as wet cell batteries, scrap metal, and tires which are marketed to various vendors. Waste oil is used as fuel to heat the recycling building. Stumps are handled at the local Brox Plant. Demolition debris is transported to either the Penacook facility or to the Turnkey Landfill in Rochester, N.H.



Town of Windham

Prior to 1975 the Town operated landfills in various locations. From 1975 to 1990 Windham was served by a small (15.5 ton/day), oil fired, modular incinerator at the Marblehead Road landfill site.

In 1987 it was apparent that the incinerator was nearing the end of its useful life. The Windham Solid Waste Committee was appointed, and in 1989 a new incinerator was proposed and approved. A 3.8-acre site was purchased on Ledge Road. Subsequent changes in federal EPA rules, and public opinion led to a vote to build a recycling/transfer station on the Ledge Road site as an alternative. The Town developed a state-of-the-art transfer station and recycling center in 1990 at a cost of \$1.2 million. The town also began closing its landfill in 1990 at a cost of approximately \$250,000.

Central to the development of the transfer station was the implementation of a comprehensive mandatory recycling program. Residents and commercial haulers bring waste directly to the drive-through facility. With few exceptions, all operations are conducted indoors. Non-recyclables were transported to the Consumate Sanco landfill in Bethlehem, NH from 1990 to 1995. In early 1995 a contract was signed with Wheelabrator Concord Company, LP., in Penacook, NH. The contract is effective until August 2000.

The facility accepts the full range of recyclables. Materials are marketed to various vendors depending on price. Demolition debris, tires, wet cell batteries, bulky wastes are also accepted. Waste oil is collected and used as fuel in an on-site burner to heat the building. Yard waste has been effectively eliminated from the waste stream, and is recycled through composting and chipping for fuel. The compost site is located on private property on Balmorra Road. The Town is continuing to locate a site on public property closer to the Ledge Road facility. Stumps, brush, and wood however, are not accepted at any site in town. These materials are sent to the Lowell Road Wood Processing Plant in Salem, NH. This Plant has proven to be less expensive than contracting on site for chipping services.

REGIONAL RECYCLING PLAN — October 2000

CHAPTER I: Current Disposal and Collection Practices

Table I-1

Collection Practices of Other Communities

Community	Mandatory/ Voluntary	Pay-As- You- Throw *	Materials Recycled
Pelham, NH	Voluntary	No	Newspaper, corrugated, mixed, office, magazines, paperboard, glass, Al cans, tin cans, PETE, HDPE, textiles, tires, oil, batteries, scrap metal, C&D debris, textiles, lead, household batteries
Walpole, NH	Mandatory	Yes-1995	Newspaper, corrugated, mixed, office, kraft bags, paperboard, glass, Al cans, tin cans, PETE, HDPE, textiles, tires, oil, batteries, scrap metal, C&D debris, compost, plastic film, swap shop
Burlington, VT	Mandatory	No	Newspaper, corrugated, mixed, office, paperboard, glass, Al cans, tin cans, PETE, HDPE, textiles, tires, oil, batteries, scrap metal
Keene, NH	Voluntary	Yes-1999	Newspaper, corrugated, mixed, glass, Al cans, tin cans, PETE, HDPE, mixed plastics, textiles, tires, oil, batteries, scrap metal, compost, food waste, pallets, Al foil, brush, swap shop
Marlborough and Roxbury, NH	Mandatory	No	Newspaper, corrugated, mixed, magazines, glass, Al cans, tin cans, PETE, HDPE, textiles, tires, oil, batteries, household batteries, scrap metal, compost, swap shop
Peterborough, NH	Mandatory	Yes-1999	Newspaper, corrugated, mixed, magazines, glass, Al cans, tin cans, PETE, HDPE, textiles, tires, oil, batteries, household batteries, scrap metal, food waste, compost, swap shop, toner cartridges, propane tanks, packaging peanuts, lead sinkers
Greenfield, NH	Mandatory	No	Corrugated, mixed, glass, Al cans, tin cans, PETE, HDPE, tires, oil, batteries, scrap metal, compost, swap shop

* A detailed explanation of Pay-As-You-Throw (PAYT) is discussed in Chapter 7

The lack of local solid waste disposal alternatives for all but one of the district's communities, and limited capacity in the remaining landfills, presents the region with a substantial challenge. All communities have begun to meet this challenge in recent years through the implementation of comprehensive recycling programs. These programs take on a variety of forms and have met varying levels of success. Although operational problems, fluctuating markets and changing regulations affect all local programs and facilities, each has succeeded in achieving significant levels (20-25%) of waste volume reduction and cost avoidance. However, the State of New Hampshire has set goal for a mandatory recycling percentage of 40% of the total volume by the year 2000. The Town of Milford passed a mandatory recycling ordinance in 1989 and has reached the State goal of 40% without any major enforcement problems. Volume reduction alone, however, cannot satisfy the long-term needs of the district.



The 1989 Regional Recycling Plan recommended that the Nashua landfill serve as a regional solid waste disposal facility. The expansion of the Nashua landfill was a key component of the District's long term planning efforts. The expansion of the landfill continues but a state-of-the-art disposal facility for approximately half of the District's total solid waste by weight never came to fruition. This is not a future option since the City of Nashua must close the unlined cells of the landfill. The available land for lined cells at Four Hills is projected to meet the City of Nashua's needs for 20 years. If the City were to receive waste from other communities, the expected lifespan of the new lined landfill would likely be decreased significantly.

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Chapter II

Waste Generation

Waste Volumes

In order to estimate the total quantity and composition of solid waste generated within the communities of the Nashua Region Solid Waste Management District, an accurate solid waste disposal estimate must be determined. Several methods of estimating solid waste generation are available. Where local facilities maintain regular records of incoming waste, the task of analyzing the waste is simplified. Where detailed local information is unavailable, state or national averages are frequently employed. Waste volume data on each town is provided by the New Hampshire Department of Environmental Services (NHDES). The data is broken down into residential waste, commercial/industrial waste, and construction/demolition waste, which includes such materials as tree stumps and yard waste. Waste volumes in tons/year are listed below:

Table II-1

1998 Waste Volumes by Town
In Tons / Year

Town	Residential Waste	Commercial/ Industrial Waste	Construction/ Demolition Waste
Amherst	3,489	371	371
Brookline	1,464	N/A	N/A
Hollis	2,619	N/A	N/A
Mont Vernon	750	N/A	N/A
<i>Souhegan Subtotal</i>	8,322	371	
Hudson	8,343	4,086	N/A
Merrimack	8,452	12,574	890
Milford	4,028	320	1,412
Nashua	41,680	35,462	10,060
Windham	5,281	N/A	N/A
TOTAL	76,106	N/A	N/A

N/A = No data was reported to DES by the Town.

Source:

Planning and Community Assistance Section, Annual Facilities Report 1998. (NHDES)



Population Projections

The municipal population projections contained in the report are developed by the Office of State Planning and are viewed as baseline data. The reasoning behind the use of OSP population projections is because they are considered a consistent and standard source.

Table II-2

2000 TO 2020 POPULATION PROJECTIONS
NASHUA REGION SOLID WASTE MANAGEMENT DISTRICT

Town	Total Pop 1998 (OSP Est)	Population Projection				
		<u>2000</u>	<u>2005</u>	<u>2010</u>	<u>2015</u>	<u>2020</u>
Amherst	10,229	10,300	11,295	12,113	13,457	14,686
Brookline	3,404	4,140	5,153	5,953	7,243	8,279
Hollis	6,760	7,374	8,535	9,299	10,696	11,940
Mont Vernon	1,982	2,115	2,326	2,448	2,708	2,978
<i>Souhegan</i>						
Subtotal	22,375	23,929	27,309	29,813	34,104	37,883
Hudson	21,723	23,156	24,904	26,267	29,013	31,656
Merrimack	23,899	24,601	26,664	28,126	30,813	32,886
Milford	12,859	13,392	14,452	15,106	16,073	17,006
Nashua	83,209	84,667	86,906	87,997	89,072	91,145
Windham	9,978	10,598	11,621	12,370	13,511	14,736
TOTAL	174,043	180,343	191,856	199,679	212,586	225,312

Source:

Municipal Population Projections 2000 to 2020, New Hampshire Office of State Planning, October 1997.

Generation Rates

Through population projections and estimates of the amount of waste produced by each person per year, annual solid waste quantities can be projected for municipalities. These estimates are called “generation rates” and are typically expressed in units of lbs/person/day. Where no information is given, this data was not reported to the DES by the Town. These generation rates are then used to determine solid waste projections in tons/year for the SWMD. Generation rates are determined for each community based upon information provided by the New Hampshire Department of Environmental Services (NHDES), Annual Facilities Report, 1998.



Table II-3

ESTIMATES OF SOLID WASTE VOLUME AND GENERATION RATES

<u>Town</u>	<u>Population</u> <u>(1998)</u>	<u>RESIDENTIAL</u> <u>Tons/yr</u>	<u>NON-RESIDENTIAL</u> <u>Tons/yr</u>	<u>Total</u>	<u>Generation Rates</u> <u>(lbs/person/day)</u>
Amherst	10,229	3,489	0	3,489	1.9
Brookline	3,408	1,464	0	1,464	2.4
Hollis	6,760	2,619	0	2,619	2.1
Mont Vernon	1,982	750	0	750	2.1
<i>Souhegan</i> <i>Subtotal</i>	22,379	8,322	742	9,064	
Hudson	21,723	8,343	4,086	12,429	3.1
Merrimack	23,899	8,452	13,464	21,916	5.0
Milford	12,859	4,028	1,732	5,760	2.5
Nashua	83,209	41,680	45,522	87,202	5.7
Windham	9,978	5,281	0	5,281	2.9
Total	164,069	81,387	65,546	141,652	

Source:

Municipal Population Projections 2000 to 2020, New Hampshire Office of State Planning, October 1997

* Non residential numbers include all waste originating from commercial/industrial sources as well as construction debris.

Waste Composition

According to the EPA in the Characterization of Municipal Solid Waste (MSW) in the United States (1998 Update), the effects of source reduction are difficult to measure at a national level, but almost certainly are affecting MSW generation. The EPA also states that no one can accurately foresee with accuracy changes in the economy, which can also affect the municipal waste stream. In addition, it is difficult to predict which innovation and new products will affect the amounts and types of MSW generation.

In spite of these limitations, it is useful to look at projections characterizing MSW based on past trends, since it is clear that the composition of the waste stream does change over time. For example, new products (e.g. disposable products) may be introduced, and materials are used in new ways (e.g. composite materials replace simpler products).

REGIONAL RECYCLING PLAN — October 2000
CHAPTER II: Waste Generation

The EPA offers projections for municipal solid waste generation were made until 2005. These making these projections, the EPA assumed that overall, MSW products would continue to grow at a rate higher than population growth and lower than growth of Gross Domestic Product (GDP). Projections for most materials and products were made using linear trends based on generation between 1980 and 1997. Projection of materials generated in the MSW for the United States (by weight) is summarized in Table II-4.

Table II-4

PROJECTIONS OF MATERIALS GENERATED* FOR THE UNITED STATES
 IN THE MUNICIPAL WASTE STREAM, 1997, 2000, AND 2005
 (In thousands of tons and percent of total generation)

	<u>Thousands of Tons</u>			<u>% of Total</u>		
	1997	2000	2005	1997	2000	2005
Materials						
Paper and Paperboard	83,840	87,700	94,770	38.6%	39.3%	39.6%
Glass	12,010	11,850	11,200	5.6%	5.3%	4.7%
Metals						
Steel	12,330	12,890	13,590	5.7%	5.8%	5.7%
Aluminum	3,010	3,430	3,780	1.4%	1.5%	1.6%
Other Nonferrous	<u>1,270</u>	<u>1,300</u>	<u>1,340</u>	<u>0.6%</u>	<u>0.6%</u>	<u>0.6%</u>
Total Metals	16,610	17,620	18,710	7.7%	7.9%	7.9%
Plastics	21,460	23,420	26,730	9.9%	10.5%	11.2%
Rubber and Leather	6,590	6,920	7,660	3.0%	3.1%	3.2%
Textiles	8,240	8,850	10,240	3.8%	4.0%	4.3%
Wood	11,570	13,960	15,810	5.3%	6.3%	6.6%
Other	<u>3,760</u>	<u>3,960</u>	<u>4,290</u>	<u>1.8%</u>	<u>1.7%</u>	<u>1.8%</u>
Total Materials in Products	164,080	174,280	189,410	75.6%	78.1%	79.1%
Other Wastes						
Food Wastes	21,910	22,550	23,480	10.1%	10.1%	9.8%
Yard Trimmings	27,730	23,000	23,000	12.8%	10.3%	9.6%
Miscellaneous Inorganic Wastes	<u>3,250</u>	<u>3,400</u>	<u>3,650</u>	<u>1.5%</u>	<u>1.5%</u>	<u>1.5%</u>
Total Other Wastes	52,890	48,950	50,130	24.4%	21.9%	20.9%
Total MSW Generated	216,970	223,230	239,540	100.0%	100.0%	100.0%

* Generation before materials recovery or combustion
 Details may not add to totals due to rounding.

Data Source:
 Franklin Associates, Ltd. *Solid Waste Management at the Crossroads*. December 1997.
Characterization of Municipal Solid Waste in the United States, 1998 Update, EPA.

As noted in the NHDES Solid Waste Report to the Legislature, 1998, the State of New Hampshire does not have a detailed accounting for components of in-state municipal solid waste; however, national estimates are believed to be fairly representative. The exception for NH is that leaf and yard waste is considerably less, due to an existing landfill ban and the rural nature of the state.

Projected Waste Volume

All analysis presented in this chapter are interpolation from current levels of solid waste generation and composition.

Per capita waste generation is primarily a function of lifestyle and legislation. It is likely that the trend toward smaller households together with a continuing increase in disposable products will lead to an increase in per capita waste generation in the future. These trends, however, are difficult to predict. Equally difficult to predict is future legislation.

Any projection scheme is dependent on assumptions. This is true regardless of the complexity or sophistication of the process employed. Basic assumptions include: that there will be no major war, civil strife or major natural catastrophe and that there will be adequate supplies of energy at reasonable costs.

The county projections are roughly based on long term trends that occurred during the 1960 to 1995 period. The local projections are based on a community's historical share of its respective county's growth. The principal assumption with this projection method is that trends of a community's population change, will remain about the same in the future. However, there are important limits and exceptions to this assumption. The basic trends in shares of county population change were established using 1970, 1980, and 1990 population totals. The municipal share of total county population was calculated for each of these years.

For consistent places, the numeric change in percent of county population was calculated. This change was applied to 1990 county share¹. This rendered a 2000 projected share for each consistent community. The same amount of change in county share was also applied to the 2000 share, rendering a 2005 county share. Thus the 2000 and 2005 projected county shares are the result of trends established by the 1970, 1980, and 1990 population levels.

However, after 2005 the influence of the historic trends begins to be diminished. For the projected period 2005 – '10 only one third of the change in shares is applied. For the period 2010 – '15 a quarter of the original change is used and the resulting share (as of 2015) is held constant and used again in the final projected period (2015 – '20). The resulting sets of shares, for consistent places, are necessarily subject to further alteration. This is because shares of inconsistent places must be entered and then all shares must be forced to sum to 100%.

¹ Actually only half of the change is applied because the historic trend is based on 10 years while the projected is 5 years.



REGIONAL RECYCLING PLAN — October 2000

CHAPTER II: Waste Generation

The Office of State Planning states that the projections presented here are of resident population and do not include seasonal persons. The projections attempt to present a set of future population levels, which reflect past and emerging trends. Because they are controlled to county and state projections, these projections are considered to be reasonable in the aggregate as well as at the local level.

These local projections are highly dependent on the limits set by county totals. The county projections are roughly based on long term trends that occurred during the 1960 to 1995 period.

Table II-5
SOLID WASTE PROJECTIONS
(Tons/Year)

	1998 OSP Population Estimate					Solid Waste Volume Projections Tons/Year					% Increase 2000 - 2020
	<u>2000</u>	<u>2005</u>	<u>2010</u>	<u>2015</u>	<u>2020</u>	<u>2000</u>	<u>2005</u>	<u>2010</u>	<u>2015</u>	<u>2020</u>	
	Amherst	10,300	11,295	12,113	13,457	14,686	4,323.4	4741.1	5,084.4	5,648.6	
Brookline	4,140	5,153	5,953	7,243	8,279	1,813.3	2257.0	2,607.4	3,172.4	3,626.2	2.0
Hollis	7,374	8,535	9,299	10,696	11,940	2,826.1	3271.0	3,563.8	4,099.2	4,576.0	1.6
Mont Vernon	2,115	2,326	2,448	2,708	2,978	810.6	891.4	938.2	1,037.8	1,141.3	1.4
<i>Souhegan Subtotal</i>	23,929	27,309	29,813	34,104	37,883	9,773.4	11,160.6	12,193.9	13,958.1	15,508.0	1.6
Hudson	23,156	24,904	26,267	29,013	31,656	13,100.5	14,089.4	14,860.6	16,414.1	17,909.4	1.4
Merrimack	24,601	26,664	28,126	30,813	32,886	22,448.4	24,330.9	25,665.0	28,116.9	30,008.5	1.3
Milford	13,392	14,452	15,106	16,073	17,006	6,110.1	6,593.7	6,892.1	7,333.3	7,759.0	1.3
Nashua	84,667	86,906	87,997	89,072	91,145	88,074.8	90,404.0	91,538.9	92,657.1	94,813.6	1.1
Windham	<u>10,598</u>	<u>11,621</u>	<u>12,370</u>	<u>13,511</u>	<u>14,736</u>	<u>5,609.0</u>	<u>6,150.4</u>	<u>6,546.8</u>	<u>7,150.7</u>	<u>7,799.0</u>	1.4
Total	194,783	208,304	217,745	233,286	24,8277	151,253.0	159727.1	165389.1	174451.2	183588.1	1.2

Conclusion

Waste volumes for the Region in 1997 was 141,281 tons per year. Populations are projected to increase 77% from 1998 to the year 2020. On average, 3.1 lbs/person/year will be generated according to the 1998 estimated population and waste volumes of the Region. Materials generated are also projected to increase each year. The average percent increase from 2000 to 2020 is 1.4.



Chapter III

Market Evaluation and Disposal Methods

This chapter will review the trends, methods and disposal costs for specific categories of materials collected by each town within the Nashua Region Solid Waste Management District (District), and by communities of similar size throughout the State and New England.

Paper Products

Paper is generally divided into four categories: newspaper, old corrugated cardboard (OCC), mixed paper, and high quality office paper. Paper products remain the biggest component of the municipal solid waste stream (MSW), comprising up to 40 percent of household trash. Almost all paper is recyclable if kept clean and dry. Paper that has been separated and baled is more marketable and commands the best prices.

According to the 1998 Environmental Protection Agency Study “Characterization of Municipal Solid Waste in the United States” (EPA), projections show some slowing of growth for newsprint and paper packaging with the exception of corrugated boxes. These grades of paper are showing the effects of decreased newspaper readership and some source reduction and material substitution in packaging. Two grades continue to show increased consumption - containerboard (corrugated boxes), and printing/writing papers (e.g., office papers, commercial printing, and direct mail). Paper and paperboard is projected to continue as the dominant material in the MSW, growing from 83.8 million tons in 1997, to 87.7 million tons, and 94.8 million tons in 2000 and 2005, respectively. It is estimated that paper and paperboard comprise 39.3 percent of MSW generation in 2000.

Every community in the District separates corrugated cardboard from the rest of the paper stream. During 1999, the Northeast Resource Recovery Association (NRRA) brokered corrugated cardboard ranging in price from \$45-\$100 a ton baled, and \$8-\$45 loose, based on a 40,000-pound minimum weight. Nashua, Merrimack, and Milford are the only communities that currently market newspaper. NRRA markets #8 newspaper at \$45-\$65 a ton baled, and \$25-\$35 for a loose load. The Souhegan District has joined other towns in the District, which mix paper products. Mixed paper (magazines and newspapers) commands the lowest price in the market at \$10-\$35 a ton baled and \$5-\$25 for a loose load. Milford is the only town to separate and bale office paper and capitalize on the top price of \$90-\$130 a ton. Unless noted in Table III-1, the figures represent total paper-recycling. An “avoided cost” is the amount saved because the community was able to market the material instead of paying for disposal.

REGIONAL RECYCLING PLAN — October 2000

CHAPTER III: Market Evaluation and Disposal Methods

Around New Hampshire, many towns ranging in population size from 2,000 to 23,000 separate all paper because they own baling equipment and have managed to find good markets for their materials. The town of Walpole separates and bales newspapers, corrugated, mixed paper, paperboard, and office paper. Pelham separates out cardboard and mixes the remainder. Dover markets office paper and corrugated and mixes the rest. Burlington, Vermont has a ready market of recycled newspaper, corrugated, office, and mixed for sale to local mills. The City of Portland, Maine has determined that is more economical to sell corrugated cardboard, and mix the remainder of the paper.

Table III-1 Paper Products

Nashua Region Solid Waste District

Town/City	Vendor	Disposal Cost	Revenue and Avoided Cost	Tonnage
<i>Souhegan District</i>	BFI – 1999 WSI- 1999/2000	No cost	Newspaper - \$3,375 Magazines - \$600 News/Mags - \$6,367	Newspaper - 759 tons Magazines - 155 tons <u>Cardboard</u> - 237 tons
Hudson	Browning-Ferris Industries (BFI)	One Contract	NA	993.19 tons July 1999 - June 2000 Do not accept cardboard
Merrimack	NRRA	\$18,200	\$6,700 AC \$5,520. <u>Cardboard</u> \$10,400 AC \$2,000	Newspaper - 460 tons Mixed - 218 tons <u>Cardboard</u> -164 tons
Milford	Waste Management BFI	No cost	\$24,090 (includes glass and plastic revenue)	Newspaper – 640.68 tons Magazines - 136.85 tons <u>Cardboard</u> - 525 tons Computer - 138 tons
Nashua	Fox Run Paper and WSI	No cost	\$52,000 AC \$1,219,200	Newspaper– 1,179.24 tons Mixed paper – 59.8 tons <u>Cardboard</u> - 14.06 tons
Windham	NRRA	No cost	\$15,000 AC \$37,453 <u>Cardboard</u> \$10,375 AC \$10,065	Mixed paper - 772.24 tons <u>Cardboard</u> - 270.51 tons

Outside the Nashua Region Solid Waste District

Pelham, NH	Waste Management	\$8,560	<u>Cardboard</u> \$4,600	Mixed Paper - 250 tons <u>Cardboard</u> - 65 tons
Walpole, NH	NRRA - Putney Paper	No cost	\$3,467 <u>Cardboard</u> : \$4,600	No information available
Burlington, VT	Various mills <u>Cardboard</u> – Cassela Waste Mgt.	No Cost	#8 Newspaper \$126,000 Ledger \$225,000 Mixed \$62,500 <u>Cardboard</u> \$126,000	#8 News 10,700tons \$45t Ledger 1,500tons \$50t Mixed 2,500tos \$25t <u>Cardboard</u> - 2,100tons \$60t



Product Containers

Although there is not a substantial price for co-mingling (all containers mixed together), the majority of the District has chosen to co-mingle their recycled containers. These communities have contracted with a private contractor to haul these materials to a manufacturing recovery facility (MRF) where they are separated, baled, and marketed. The communities of Merrimack, Milford, Nashua and Windham co-mingle the glass but segregate the plastic, tin, and aluminum.

According to the EPA, containers and packaging represent the primary source of aluminum in the MSW, although some aluminum is present in durable and non-durable goods. Aluminum in MSW has grown, and the growth is projected to continue, to 3.4 million tons and 3.8 million tons in 2000 and 2005, respectively. Because of its light weight, aluminum represents a small percentage of the MSW. It constituted 1.4 percent in 1997, and is projected to amount to 1.5 percent in 2000, and 1.6 percent in 2005.

Glass

According to the EPA, glass products (mostly packaging) have been declining both in tonnage and in percentage of MSW generation since 1993. This trend is projected to continue, with the percentage of glass in the MSW continuing to decline. Glass generation is anticipated to decline from 12 million tons in 1997, to 11.9 million tons and 11.2 million tons in 2000 and 2005, respectively. For 2000, this represents 5.3 percent of projected total MSW generation. This percentage has decreased due to increased use of aluminum and plastic by the beverage industry.

Waste glass is divided into to four major categories: clear, green, brown/amber, and miscellaneous glass such as mirrors, windows, etc. Glass can be marketed separately or mixed. The segregated glass is primarily used for new glass containers. Clear glass is the easiest and most profitable to market followed by brown glass. The market prices are volatile and change on a weekly basis. Currently, the Northeast Resource Recovery Association (NRRRA) brokers glass based on a 20-ton minimum. Although market prices change on a weekly basis, clear glass was \$20 a ton, brown/amber ranged between \$10-16 a ton, and green glass was \$3 a ton. With the exception of Milford, all municipalities mix the glass together or co-mingle the glass with other containers for recycling.

REGIONAL RECYCLING PLAN — October 2000

CHAPTER III: Market Evaluation and Disposal Methods

Table III-2 Glass Containers

Nashua Region Solid Waste District

Town/City	Vendor	Disposal Cost	Revenue	Annual Tonnage
<i>Souhegan District</i>	BFI — Co-mingled with all containers	\$40/ton \$18,236	None	Total co-mingled containers 640 tons
Hudson	BFI - Co-mingled with all other containers	No info	None	Total co-mingled 383 tons July 1999 - June 2000
Merrimack	Town use	No cost	None	223 tons (crushed) spread on landfill
Milford	BFI	No cost	\$24,090 includes paper/plastic revenue	Clear - 305 tons Amber - 203 tons Green - 130 tons
Nashua	Rayan Investments Container Recycling Alliance	No cost	\$4,250 AC \$46,400	348.51 tons
Windham	NRRA	No cost	\$2,189 est. AC \$12,653	Clear - 107 tons, Amber - 64 tons, Green - 89 tons

Outside the Nashua Region Solid Waste District

Pelham, NH	Crushed on site for Hwy Dept	\$170 mo Staff	No revenue	Don't track quantity
Walpole, NH	NRRA	No cost		\$500
Burlington, VT	Corning Glass Giveaway Program	No cost	\$28,000 \$8,250 \$2,500 None	Clear 1,000 tons \$28t Green 825 tons \$10t Amber 100 tons \$25t Aggregate 820 tons -0-

Plastics

While most of the plastic in the waste stream cannot be easily recycled, two of the more common forms can be easily separated, baled, stored, and marketed. These include polyethylene terephthalate (PETE) which is used for soda bottles, and high-density polyethylene (HDPE) used for milk containers, plastic cups, and lids. In addition, Polyvinyl chloride (PVC) is potentially recyclable. Traditional waste disposal methods are not adequate for the disposal of the growing quantities of plastic. Plastic does not decompose, and when incinerated, contributes undesirable emissions to the environment.

REGIONAL RECYCLING PLAN — October 2000

CHAPTER III: Market Evaluation and Disposal Methods

Generation of plastics in the MSW has grown very rapidly, with average annual growth rates of more than 9 percent experienced during the 1970s and 1980s according to the EPA. Growth of plastic generation has continued in the 1990s. However, the annual growth rate has slowed to approximately 3 percent per year during this decade. Based on this historical trend, plastics in MSW are expected to continue to increase in tonnage, but at a projected rate closer to the 1990s. Plastics in MSW are projected to continue to increase both in tonnage (from 21.5 million tons in 1997 to 23.4 million tons and 26.7 million tons in 2000 and 2005, respectively) and in percentage of total MSW generation (from 9.9 percent of MSW in 1995 to 11.2 percent in 2005).

The NRRA bases its pricing for plastic on 30,000 pounds baled or granulated. During 1999 PETE (#1) was priced at \$0.05/pound. Natural HDPE (#2) ranged from \$0.07-\$0.14/pound baled and \$0.12-\$0.19/pound granulated. Colored plastic is slightly lower at \$0.03-\$0.06/pound baled and \$0.08-\$0.11/pound granulated. Plastics #2-7 mixed (baled) are priced by the pound daily due to decreased marketability.

Table III-3 Plastic Containers

Nashua Region Solid Waste District

Town/City	Vendor	Disposal Cost	Revenue	Annual Tonnage
Merrimack	NRRA-Enviro Plastics and Wellman	No cost	\$5,000 AC \$600.	Natural #2/Colored HPDE 27 tons Clear 5 & 7/#1 PETE 21 tons
Milford	E.L. Harvey & Sons BFI	No cost	\$24,090 with paper/glass	Clear 5 tons, PETE 60 tons, Colored HPDE 15 tons
Nashua	Wellman Sun Valley Recycling	No cost	\$15,850 AC \$14,800	PETE – 57.08 tons HDPE – 54.83 tons
Windham	NRRA	No cost	\$10,200 est. AC \$3,522.	72.62 tons

Outside the Nashua Region Solid Waste District

Pelham, NH	Waste Management	\$4,000	None	No info Accept numbers 1 - 7
Walpole, NH	NRRA	No cost	\$1,950	No info
Burlington, VT	Various mills	No cost	\$80,000 \$49,000 \$48,000	Natural HDPE 400 tons \$200t Colored 350 tons \$140t PETE 300 tons \$160t

Metals and White Goods

Metals are divided into two main categories for the purpose of recycling; ferrous and non-ferrous. Ferrous metals include scrap metal and tin/steel cans. Non-ferrous metals include aluminum, copper, and lead. Washing machines, stoves, dryers, refrigerators, freezers, and air conditioners are considered “white goods”. The only communities in the District that separate and market tin and aluminum are Merrimack, Milford, Nashua, and Windham. The Souhegan Regional Landfill District (SRLD) will begin recycling aluminum cans on a trial basis this fall in Amherst and Hollis. If sufficient quantities are collected to justify the use of an additional dumpster, Brookline and Mont Vernon will also start collecting.

The town of Milford separates the metal into five piles; cast iron, copper/brass/lead, aluminum, light metals, and heavy metals. Heavy metals are all white goods, tail pipes, mufflers, oil tanks, and heating systems. The towns of the SRLD contracts with NRRA to remove the freon from refrigerators, freezers, dehumidifiers, and air conditioners so that the metal can be marketed. The other communities arrange with their vendors to have the freon evacuated. These materials are then combined with the rest of the white goods. All metal is then hauled away when a sufficient amount is reached to warrant trucking to their destinations in New Hampshire, Maine, and New York.

NRRA bases their loads on a gross ton (Gt), which is 2,240 pounds. During 1999, piles under 50 tons receive between \$16-21/Gt and piles over 50 tons are \$23/Gt. Aluminum cans ranged between \$0.32-\$0.43/lb. loose and \$0.41-\$0.53/lb. baled. Tin cans ranged between \$0-\$20/ton loose and \$13-\$35/ton.

Table III-4 Metals and White Goods
Nashua Region Solid Waste District

Town/City	Vendor	Disposal Cost	Annual Revenue	Annual Tonnage
SRLD Amherst	NRRA- Northeast Metals Grimmel Ind.	No cost	\$4,953 \$8 freon removal	In with other quantities
Brookline	NRRA- Northeast Metals Grimmel Ind.	No cost	\$1,500 \$8 freon removal	Approx. 107 tons
Hollis	NRRA- Northeast Metals Grimmel Ind.	No cost	Approx. \$2,000	In with other quantities
Mont Vernon	NRRA- Northeast Metals Grimmel Ind.	No cost	\$694.96	In with other quantities
Hudson	BFI Keeps the revenue	One contract price	<u>White goods</u> with CFC \$15.25 w/o \$10	70.14 tons from July 1999-June 2000
Merrimack	NRRA- Advanced Recycling- RAD Recycling	\$5,800 No costs	\$6,800 AC \$4,700 White Goods AC \$800	Al cans 12 tons Tin 35 tons Scrap 398 tons

REGIONAL RECYCLING PLAN — October 2000

CHAPTER III: Market Evaluation and Disposal Methods

Table III-4 Metals and White Goods (continued)

Nashua Region Solid Waste District

Town/City	Vendor	Disposal Cost	Annual Revenue	Tonnage
Milford	Jewell Resources Cohen's for freon	No cost	\$2,868. Charge \$15 for freon	Al cans 60.25 tons Tin 66.97 tons Scrap 875.25 tons
Nashua	Industrial Metal Recycling, R.A.D. and Advanced Recycling	No cost <u>White goods</u> \$2,050	\$33,565 AC \$105,600 White \$8,000 AC \$12,800	1942 units 151.59 tons
Windham	Proler	No cost	AC \$12,776	263.40 tons

Outside the Nashua Region Solid Waste District

Pelham, NH	R.A.D Recycling Salem Metals	No cost	No rev for scrap Al/Brass/Cast Iron/Stain. Steel \$300-400 ton Light Iron \$5 ton	Don't track quantity
Walpole, NH	Hodgdon Bros. Steel Aluminum NRRA	Scrap no cost Al no cost	No rev for scrap \$15,000 Al	No information
Burlington, VT	Various mills	No cost	Tin/BI \$30,000 Al \$43,750 Scrap \$42,000	850 tons \$35t 50 tons \$875t 1,200 tons \$35t

Compost

Composting consists of the deliberate management of the natural system of decomposition, which converts organic material into humus. Humus is an excellent soil supplement that is high in carbon and nitrogen. Compost added to the soil results in healthier plant growth because it improves soil structure and provides a beneficial environment for earthworms and other beneficial soil organisms. Composting is a low technology, cost effective method of recycling food and soft yard wastes (grass clippings, weeds, leaves). It is an environmentally sound method to conserve energy resources by reducing transportation and incineration costs and reducing landfill space needs. It is estimated that on an average monthly basis that food and yard wastes represent 20 percent of the MSW. During the summer and fall the figures may rise to 70 percent of the MSW.

The 1989 Regional Recycling Plan stated “at a bare minimum, individually or collectively District communities should institute a yard waste reclamation program”. Since then, every community in the District has opened a section at their facility for composting. Although the piles are not layered or watered for optimal breakdown of the material, they are occasionally moved by front-end loaders to improve aeration and provide more space at the site. All communities except Nashua and Mont Vernon make the finished compost available to residents. Nashua uses the material as a replacement for trucked soil to cover the Four Hills Landfill. All the Public Works Departments use the compost for town property enhancement such as mulching, erosion control, and soil restoration projects. The Natural Resources Conservation Service, Farmers Cooperatives, Garden Clubs, and University Cooperative Extension Services have long advocated home composting. Recently the City of Nashua offered compost bins at cost to residents in conjunction with the observance of Earth Day.

The Nashua Wastewater Treatment Plant currently sends 30 percent or approximately 6,000 tons of its treated sludge to the Merrimack Wastewater Treatment Plant Composting Facility. Here the sludge is combined with sawdust and turned into compost. This saves 6,000 tons of material, which would have been landfilled. In 1983 Merrimack began producing compost using a static compost process. In 1994, the Town switched to the invesile process which, is completely enclosed and uses heat to speed the breakdown of materials. The facility produces between 8,500-9,500 dry tons a year, which is marketed to country clubs for golf courses and universities for their athletic playing fields in New York, Rhode Island, and Massachusetts. In 1999, residents picked up 5,000 cubic yards at the compost facility.

The Town of Milford has recently begun transporting all leaves to the wastewater treatment plant to mix in with the sludge. Between the two facilities, 600 cubic yards or 400 tons is available for town residents.

The City of Nashua is in the process of building a new Egg-shaped Anaerobic Digester to decrease the amount of sludge produced each year that must be landfilled. The methane produced from this process will produce electricity to run a portion of the treatment plant. Future plans include a compost facility, and will eliminate many of the materials presently being landfilled. This does not include the material used for daily cover at the Four Hills Landfill.

REGIONAL RECYCLING PLAN — October 2000

CHAPTER III: Market Evaluation and Disposal Methods

Table III-5 Compost
Nashua Region Solid Waste District

Town/City	Vendor	Disposal Cost	Annual Revenue	Annual Tonnage
<i>SRLD</i> Amherst	Dept. Public Works	No cost	None	Do not track amounts Available to residents
Brookline	Dept. Public Works	No cost	None	Approx. 35 tons
Hollis	Dept. Public Works	No cost	None	Do not track amounts
Mont Vernon	Dept. Public Works	No cost	None	Do not track amounts Not available to residents
Hudson	BFI	One Contract	One Contract	97.5 tons July 1999-June 2000 Not available to residents
Merrimack	Dept. Public Works	No cost		4,000 cubic yards Available to residents
Milford	Dept. Public Works	No cost	AC \$30,000	600 cubic yards Available to residents.
Nashua	Solid Waste Dept	No cost	AC \$320,000	3,966.3 tons Not available to residents
Windham	Dept. Public Works	No cost	AC \$4,716	97.23 tons

Outside the Nashua Region Solid Waste District

Town/City	Vendor	Disposal Cost	Annual Revenue	Tonnage
Pelham, NH	Does not accept	NA	NA	NA
Walpole, NH	Local	No Cost	NA	No information available
Burlington, VT	Various	\$150,000	None	6,000 tons \$25t



Tires

In New England 13,000,000 scrap tires are generated every year. In the past tires were stored in mountainous heaps, creating a fire hazard and mosquito breeding ground at landfills and transfer stations. Landfilling has never been a satisfactory long-term solution since tires tend to resurface after time. However, there are still a few clay lined, water filled quarries in operation. The District communities simply save tires until the maximum load capacity as specified by their contracted vendor is reached. The majority of the communities contract with J.P. Routhier & Sons, Inc. (Routhier) of Littleton, Massachusetts. The Routhier operation has developed into the largest scrap tire recycling business in the northeast, processing 5,000,000 tires each year. The 18-acre site located in Ayer, MA is the only permitted facility of its kind in New England. The Massachusetts Department of Protection (DEP) issued four Beneficial Use Determinations (BUDs) for the following: shreds for lightweight fill in Civil Engineering Applications, alternative materials in landfills, shreds as playground surfaces, and chips as drainage materials. Each tire goes through a culling process in which steel rims and inner tubes are removed. Some tires are salvaged for reuse as used tires. The steel rims are recycled in foundries, where they are melted down and then processed into recycled products in the iron and steel industries. The tubes are reprocessed by the rubber industry. The actual tires go through the steps of shredding and screening to produce chips of various sizes.

Some of the chips are marketed as tire-derived fuel for use by paper mills and power plants. Tire derived fuel has been, and remains, the biggest market outlet for tire shreds produced at the facility. Rubber chips are also used in production of rubberized asphalt paving materials. According to the Northeast Resource Recovery Association (NRRA), the market in Canada is now cheaper with costs ranging between \$85-105 a ton for a minimum load of 1,200 tires. Canada's biggest market is tire-derived fuel for the numerous paper mills and power plants. A few specialized industries also exist for producing matting for concrete floors and tire swings.

REGIONAL RECYCLING PLAN — October 2000

CHAPTER III: Market Evaluation and Disposal Methods

Table III-6 Tires

Nashua Region Solid Waste District

Town/City	Vendor	Disposal Cost	Annual Revenue	Annual Tonnage
<i>SRLD</i> Amherst	NRRA JP Routhier or Canada	\$1,955	\$2.50 per Tire/ \$10 per Truck Tire	In with other materials
Brookline	NRRA Sends to Canada	\$3,200	\$742 Car \$2, w/rim \$5, Truck \$7 w/rim \$12	2,000 collected 36 tons
Hollis	NRRA JP Routhier	\$2,000-3,000	Car \$2, w/rim \$4, Truck \$8-10 w/rim \$14, Tractor \$25, Loader \$50	2,000 plus tires collected
Mont Vernon	Tire Recycling Service Brookline	\$439	\$1 per Tire	272 tires collected
Hudson	Do not accept	NA	NA	NA
Merrimack	NRRA - J.P. Routhier	\$3,500	\$2 per Tire Avoided cost \$600	1,170 tons
Milford	Mainline Tire	\$1,007	Car \$1 w/rim \$1.50, Truck \$5, w/rim \$11, Tractor \$16, w/rim \$22	51.15 tons
Nashua	J.P. Routhier	\$12,000	Car \$1, Truck \$3	13,031 tires collected Approx. 12 tons collected
Windham	NRRA	\$2,200	Avoided cost \$1,780	24.28 tons

Outside the Nashua Region Solid Waste District

Pelham, NH	Cassella	\$4,602	No charge for tires	Collected 40 tons
Walpole, NH	NRRA J.P. Routhier	No information	No information	No information
Burlington, VT	J.P. Routhier	\$29,000 yr including all labor	City charges \$135/ton	300 tons \$97 ton

Batteries

All of the communities in the District with the exception of Hudson collect automotive batteries and market them within the state. The batteries are generally stored until a sufficient amount has accumulated to warrant vendor's transportation costs. The principle by-product in automotive batteries is lead, which is recycled.

Household dry cell batteries can contain one or more of the following eight metals: nickel, silver, lithium, manganese, zinc, lead, cadmium, and mercury. When disposed of in an unlined landfill, batteries can leach toxic components and contaminate groundwater. Cadmium and mercury pose a threat in incinerators because the extreme heat in the process volatilizes them. Once volatilized, they can pose a threat to humans as inhalable emissions or as leachable elements in the ash by-products.

In 1996, the Mercury-Containing and Rechargeable Battery Management Act was signed into federal law. This law prohibits batteries containing mercury from being manufactured or sold. It sets the standards for the labeling of nickel-cadmium and small sealed lead acid rechargeable batteries. This law also sets the standards for the collection, storage, and transportation of used mercury containing and rechargeable batteries.

The Department of Environmental Services (DES) and the Rechargeable Battery Recycling Corporation (RBRC), a non-profit public service organization created by the Rechargeable Power Industry, have developed a partnership to provide a free Nickel-Cadmium (Ni-Cad) battery recycling program called "Charge up to Recycle!" The RBRC pays for the program through the licensing of a proprietary seal to Ni-Cad battery and product manufacturers. The RBRC will provide the following materials through DES:

- Ni-Cad battery collection, storage, and shipping containers, using five-gallon buckets which meet the required National Safe Transit Association Test Procedure for collection and shipping the batteries for recycling. Each bucket is labeled to comply with the federal Universal Waste Rule.
- Pre-paid UPS shipping labels included with each bucket.
- Safety instructions and plastic bags to separate the used Ni-Cad batteries included in each bucket.
- Promotional posters and national press releases.

There are two basic types of batteries - “primary” (non-rechargeable) and “secondary” (rechargeable). Since some batteries contain valuable metals, the costs of recycling some battery types are minimal or non-existent. There are many companies across the United States that batteries can be shipped to for recycling. The following is a summary of the variety of household batteries on the market.

Non-Rechargeable:

- Zinc carbon labeled as “all purpose” or “general purpose” and Zinc Chloride are labeled as “heavy duty” or “super heavy duty”. Both types are non-hazardous and can be placed in the regular trash.
- Alkaline manganese batteries sold after May 13, 1996 can safely be placed in the trash. Older batteries may contain mercury and should be disposed at the Household Hazardous Waste (HHW) collections.
- Lithium batteries are commonly used in cameras. Lithium batteries are potentially reactive and, if not completely discharged, should be managed as hazardous waste.
- Button cells are small, disc shaped batteries commonly used in hearing aids, medical devices, watches, calculators, and cameras. Mercuric oxide and alkaline manganese buttons may contain mercury if purchased prior to May 13, 1996 and should be brought to the HHW collections.
- Zinc Air Button cells are non-hazardous replacement for the older mercury button cells and can be replaced.
- Silver oxide Button cells may be hazardous for silver and should be recycled or brought to HHW collections.

Rechargeable:

- Nickel-cadmium may be built into rechargeable appliances, such as hand tools and electronic equipment, or sold as free standing units. Unless completely discharged, Ni-Cad batteries should be individually placed in plastic bags before being stored with other nickel-cadmium batteries. They can be recycled or brought to HHW.
- Sealed Lead Acid is used in some camcorders and cellular phones. Because of the lead and the acids, they should be recycled or brought to HHW.
- Nickel Metal Hydride is also used in the items listed above but is considered non-hazardous and can be recycled.
- Lithium Ion packs is used in some cellular phones and notebook computers. Unlike lithium metal batteries, lithium ion batteries are not hazardous and can be recycled.

Table III-7 Automotive Batteries
Nashua Region Solid Waste District

Town/City	Vendor	Disposal Cost	Annual Revenue	Annual Tonnage
SRLD Amherst	Salem Metal Recycling and Interstate Batteries	No cost	\$1,025	In with other materials
Brookline	NRRA	No cost	\$86	In with other materials
Hollis	NRRA	No cost		Infrequent- nothing this year
Mont Vernon	Global Recycling Tech.	\$439	\$272	In with other materials
Hudson	Do not accept	NA	NA	NA
Merrimack	Interstate Batteries	No cost	\$1,200 AC \$200	17 tons
Milford	Interstate Batteries	No cost	\$ 118	21.95 tons
Nashua	Interstate Batteries	No cost	\$1,200	1,117 collected 18.59 tons
Windham	Local	No cost	\$747 AC \$362	

Outside the Nashua Region Solid Waste District

Pelham, NH	Salem Batteries	No cost	\$375 No Charge	16 tons
Walpole, NH	Does not accept	NA	NA	NA
Burlington, VT	Interstate Battery	No cost	\$1ea = \$2,500	2,500 collected

Used Motor Oil

After years of improper dumping in the United States, the State of New Hampshire through the Department of Environmental Services (DES) has developed a program publicizing the hazards posed by waste oil to the environment. The DES currently offers a grant to communities for a “Do-It-Your-Self” used oil collection center. These grant monies can be used for establishing or rehabilitating existing programs. Municipalities have used the grant money to buy used oil containers, to provide secondary spill containment, to purchase used oil filter crushers, and to construct sheds to house their oil tanks and signs. Used oil heaters have been another popular purchase throughout the state. The space heaters are fueled with used oil to heat a recycling center or highway garage. By burning the used oil as fuel, instead of buying virgin #2 fuel oil, municipalities save money over the long run.

REGIONAL RECYCLING PLAN — October 2000

CHAPTER III: Market Evaluation and Disposal Methods

The entire District collects used motor oil with the exception of Hudson. Hudson residents transport their oil to the Household Hazardous Waste collection sites throughout the year. Within the District, the towns of Merrimack and Milford have on-site used oil burners to heat their recycling centers. The remaining communities pay contractors to pump their tanks and dispose of the oil or give it away to local residents. Nashua is currently upgrading their waste oil area with construction and equipment improvements. These include new signs, paint, and a double-wall storage tank.

Table III-8 Used Motor Oil

Nashua Region Solid Waste District

Town/City	Vendor	Disposal Cost	Annual Tonnage
Amherst	Total Waste Mgt.	\$1,054	Don't track quantity
Brookline	Wentworth Oil Service	No cost	1,400 gallons collected
Hollis	Total Waste Mgt.	\$680	Don't track quantity
MontVernon	Used by residents	No cost	Don't track quantity
Hudson	Do not accept	NA	Residents bring to HHW
Merrimack	Used to heat facility Total Waste	\$300 AC \$300	7,200 gallons for heating Summer/contaminated tanks
Milford	Used to heat facility	No cost	4,000 gallons
Nashua	Total Waste Mgt.	\$2,050	11,824 gallons
Windham	Total Waste Mgt. Used to heat facility	\$500 AC \$907	18 tons 4,989 gallons

Outside the Nashua Region Solid Waste District

Pelham,NH	Wentworth Oil	No cost	Collected 5,400 gallons
Walpole,NH	Local	No cost	Don't track quantity
Burlington, VT	Total Waste Mgt.	\$13,000/yr	65,000 gal/yr @ .20 gal

Propane Tanks

Propane dealers no longer accept propane tanks unless they are exchanged for a refill. The tanks can not be combined in the scrap metal unless the valves are removed and the gas evacuated. This has been a problem due to the risk of explosions in compactors and incinerators. Fortunately a small amount of revenue is realized for the safe storage and proper disposal of the tanks.

Table III-9 Propane Tanks

Nashua Region Solid Waste District

Town/City	Vendor	Disposal Cost	Annual Revenue	Annual Tonnage
<i>SRLD</i> Amherst	NRRA Tank Recyclers	No cost	Receive \$.50 a piece	In with other materials
Brookline	NRRA	No cost	In with metal numbers	In with other materials
Hollis	NRRA	No cost	Receive \$.50 a piece	Collect between 100-200
Mont Vernon	No information sent	No info	In with metal numbers	In with other materials
Hudson	Do not accept	NA	NA	NA
Merrimack	NRRA	No cost	\$100	In with other materials
Milford	Jewell Resources	No cost	In with metal numbers	Collected 600
Nashua	Tank Recyclers	No cost	\$450	1,124 collected 10.12 tons
Windham	NRRA	Market	In with the metal numbers	In with other materials

Outside the Nashua Region Solid Waste District

Pelham, NH	R.A.D Recycling	No cost	NA	Don't track scrap metal
Walpole, NH	Don't accept	NA	NA	NA
Burlington, VT	Various mills	NA	Included in scrap metal	Don't track scrap metal

Computers and Electronics

The rapid change in technology in the computer and electronic industries has sparked considerable concern nationwide among waste management personnel. According to DES Waste Management Division, high volumes of waste electronics, which includes cathode ray tubes (CRTs), computers and televisions, are expected to be an additional drain on landfill space over the next twenty years. Nationwide, CRTS and televisions are anticipated to add over 9 million tons of waste and 23 cubic yards in capacity volume from homeowners alone. Introduction of high definition television (HDTV) components is also expected to accelerate disposal of conventional television sets.

In 1999 the DES began assessing the volume of electronic and computers in households statewide. NRPC conducted a survey at 5 of the Household Hazardous Waste collections last fall to assist the State in their investigation. This statewide survey should be complete in the late fall of 2000. Within the District, Windham is the only town to use DMC, a recycling contractor, to properly dispose of the materials. The town collected approximately 16.5 tons at a cost of approximately \$5,000 (\$800 avoided costs). Amherst has a local market for used computers. Milford puts them in the “Still Good Shop” or disposes with the construction debris. At this time, the remaining municipalities are landfilling computers and electronics. Walpole, NH has a local market for their materials.

Textiles

Although textiles do not constitute a large volume of the waste stream as a whole, they are easily recyclable into a variety of products in the paper industry. Planet Aid has joined with NRRA to accept clothing, towels, linens, shoes, and toys. The products that are salvageable are distributed by a variety of non-profit organizations to shelters and disaster areas.

Table III-10 Textiles

Nashua Region Solid Waste District

Town/City	Vendor
Amherst	NRRA (Planet Aid)
Brookline	Goodwill and EcoSmith \$240 240 pounds
Hollis	NRRA (Planet Aid)
Mont Vernon	Ecosmith Recyclers
Hudson	No information available
Merrimack	Salvation Army AC \$600 47 tons
Milford	Salvation Army and Ecosmith Recyclers which donated \$1,133 to Milford Share 56,275/lb
Nashua	Goodwill and the Salvation Army 258.35 tons
Windham	Lazarus House-67 tons Avoided costs 3,254

Table III-10 Textiles (continued)

Outside the Nashua Region Solid Waste District

Pelham, NH	Eco-Smith
Walpole, NH	NRRA
Burlington, VT	Various private vendors Town receives .03/lb

Construction Materials

Construction and demolition materials (C&D) continue to be a major contributor to the waste stream. According to the DES Waste Management “1998 Solid Waste Report to the Legislature,” C&D waste generation in 1997 was estimated at 161,400 tons statewide. DES estimates that 85 percent of all residential C&D waste generated was disposed of in state. The NRRA charges \$45/ton for clean wood and \$49 for a mixed load for disposal. Processing of the bulk of C&D generated in New Hampshire is done by two major facilities: ERRCO in Epping and the Lowell Road Wood Processing Plant in Salem. Together, these two facilities accepted over 50,000 tons of C&D from New Hampshire generators alone.

The City of Nashua, Merrimack, and Hollis charge by pound or by the load size and bury the C & D in landfills. All commercial materials are charged \$40 a ton. Hollis only accepts drywall, shingles, paneling, insulation, painted, stained and pressure treated lumber for shipping to ERRCO. Stumps and logs are burned or buried at the site on Depot Road. Amherst and Milford also have purchased scales in recent years. Pelham is considering purchasing a scale on the recommendation from NRRA.

The materials processed from the C&D are not considered recyclables. The majority of the materials is sent to out-of-state biomass facilities or used as landfill cover. The remainder is disposed of in landfills and incinerators. These two facilities have saved the State a considerable amount of landfill space and energy generation at incinerators.

REGIONAL RECYCLING PLAN — October 2000

CHAPTER III: Market Evaluation and Disposal Methods

Table III-11 Construction and Demolition

Nashua Region Solid Waste District

Town/City	Vendor	Disposal Cost	Annual Revenue	Annual Tonnage
<i>SRLD</i> Amherst	NRRA - ERRCO	\$60,015 \$36,000 for scale	\$66,182 (includes refrigerators and tires)	In with other materials
Brookline	Landfilled	No cost	By the size of the load (no scale). Ranges \$10 - 300	Did not track quantity
Hollis	NRRA - ERRCO	\$50,000	Charge by the load size (no scale). Ranges \$10 - 300	1,063 tons collected
Mont Vernon	NRRA-ERRCO	No cost	Residents pay at the scale in Amherst	In with other materials
Hudson	BFI	One contract	One contract	Included in monthly cleanup tonnage
Merrimack	Landfilled	No cost	Commercial only	26 tons
Milford	Atlantic Waste	\$97,565	\$65/ton Charge commercial haulers \$40/ton.	1,501 tons collected
Nashua	Landfilled	No cost	NA	Don't track quantity
Windham	Devito	\$50,329	NA	734 tons collected

Outside the Nashua Region Solid Waste District

Town/City	Vendor	Disposal Cost	Annual Revenue	Annual Tonnage
Pelham, NH	Don't accept	NA	NA	Refer to Lowell Rd Wood Processing in Salem
Walpole, NH	NRRA (ERRCO)	\$42/ton	Charge \$30 yard	-0-
Burlington, VT	Don't accept	NA	NA	NA

Household Hazardous Waste

The Nashua Regional Household Hazardous Waste (HHW)/Small Quantity Generator (SQG) Collection Program is open to the residents of Amherst, Brookline, Hollis, Hudson, Litchfield, Merrimack, Milford, Mont Vernon, Nashua, Pelham, and Windham. All towns with the exception of Litchfield and Pelham are members of the Nashua Region Solid Waste Management District (both Litchfield and Pelham each pay an annual fee to offer this program to local residents). In 1996, a permanent storage facility was installed on the grounds of the City of Nashua Public Works Garage. This made it possible to hold regular collection events and store waste over a 90-day period. At the time of construction, the Nashua facility was the only permanent HHW facility in New Hampshire. In 1999, the District was granted a continuation of the Transfer Station Operating permit, which expires in April 2001.

Since the opening of the permanent facility, one item of concern is the contrast in participation rates between towns close to the permanent facility and towns more distant. In 1998, the Nashua Regional Planning Commission (NRPC), on behalf of the Nashua Region Solid Waste Management District (District) and the New Hampshire Department of Environmental Services (DES), completed a public survey in part to evaluate the success of the hazardous waste collection program. The report entitled “Examining Barriers to Household and Small Quantity Generator Participation in a Regional Household Hazardous Waste Collection Program” found that distance to the collection site is indeed a barrier to participation. The 1998 Report suggested that implementing satellite collections outside of Nashua would help to bring in those residents that the permanent center is now missing.

In 1999 a modification to the Hazardous Waste Transfer Facility Permit #DES-HW-TF-96-001 was adopted to allow the facility to accept, store, and consolidate full quantity generator waste derived from HHW satellite collections in the District. Waste from a satellite site is transported to the Nashua facility by a registered hazardous waste transporter, currently Safety-Kleen. All waste received in Nashua is manifested in accordance with the requirements of Env-Wm 510. The HHW is stored for no more than ten days at the Nashua facility [Env-Wm 110.01 (b) (116)]. During that ten-day period, the partially filled drums can be co-mingled with the waste collected at the Nashua facility. A revision of the facility’s Operating Plan, which defines the procedure for handling and manifesting the satellite material, was also completed.

During this same period a modification of the operating permit was made to allow temporary storage of hazardous material collected during emergency operations by response personnel. The Souhegan Mutual Aid Hazardous Materials Response Team (SMART) had no secure site for the temporary storage of wastes collected during spills or any other emergency situations. This allows for secure storage until manifesting is complete and a cleanup contractor and/or other authorized personnel can arrange off-site transport.

In the year 2000, DES is operating under the Universal Waste Rule Policy although the Rules will not be formally adopted until the late fall. This applies to certain low-risk wastes such as mercury-containing thermostats and lamps, antifreeze, batteries, and pesticides. These products are no longer subject to the rigorous standards that apply to “high-risk” hazardous waste. The objective of the Rule is accelerate the flow of certain universal wastes to consolidation points to encourage recycling, and to remove potentially polluting hazardous waste from the solid waste stream. The most important points of this DES policy and rule are:

- This policy applies to handlers, transporters, and destination facilities (Recyclers and Treatment/Storage/Disposal facilities). Under this policy, "handlers" of universal waste include generators storing their own waste and facilities, which collect universal waste from generators.
- Recyclers of universal wastes have a period of three days before it is considered “storage” and subject to permitting requirements of the NH Hazardous Waste Rules.
- Transfer stations and recycling centers may store materials up to one year before transporting the material to the final destination.
- Accumulation of universal waste by a handler cannot be more than 5,000 kilograms at the site, at any one time.
- Handlers and transporters are not required to complete a hazardous waste manifest.
- Handlers are not required to use a licensed hazardous waste hauler to transport universal wastes.

The adoption of this Policy will enable individual communities to host limited HHW collections and transport waste to the permanent facility on regular collection days. The communities can set their own rules concerning the collections at transfer stations or recycling facilities, i.e. restricted hours, specific items. Transport must be in a municipal vehicle by municipal personnel that have successfully completed the DES training. It is anticipated that the convenience of the site will increase participation rates. The District is in the process of developing a procedure for tracking participation figures.

The current operating schedule provides seven monthly collection events and two satellite collections from April to November. A satellite collection is held on the west side of the Merrimack River in the spring and on the east side in the fall. Starting in FY2001, the satellite collections will be held on a weekday afternoon to accommodate religious practices and people who work on the weekends.

REGIONAL RECYCLING PLAN — October 2000
CHAPTER III: Market Evaluation and Disposal Methods

A recurrent goal for the district has been to increase participation in those towns that have low attendance and that are most distant from the central collection site. Education and Awareness efforts initiated by the district have included direct mailings, press releases, newspaper inserts, and handouts. In addition, NRPC staff have attended community events and staged educational displays to publicize the program. Brochures and collection schedules are available at most Town offices and solid waste facilities

In the spring of 2000, the District provided real estate agents and mortgage companies with flyers for homebuyers about the free and safe disposal program. Future plans include developing a small quantity generator (SQG) database to reach the approximately 5,000 businesses in the District. Participation has been extremely low over the years. The program is not free for SQGs but the transportation savings alone constitute an economic incentive. The quantity of waste that SQGs are able to transport has increased from 20 to 55 gallons.

High levels of household participation since 1997 make this center one of the best attended HHW collection programs in New Hampshire. According to published reports, a national average for household participation falls within the range of 1.5–2.0 percent. Since 1998, the percent of households in the District that utilize this prom has ranged between 2.7 and 2.9 percent.

Table III-12

Yearly Participation Rates

<i>Community</i>	<i>1996</i>	<i>1997</i>	<i>1998</i>	<i>1999</i>	<i>Spring 2000</i>
Amherst	67	116	136	139	53
Brookline	5	6	13	40	18
Hollis	14	14	68	47	30
Hudson	109	208	249	213	118
Litchfield	0	31	71	104	35
Merrimack	54	97	147	172	54
Milford	27	44	64	150	57
Mont Vernon	10	14	14	31	11
Nashua	524	913	1,127	1,272	479
Pelham	24	29	46	187	28
Windham	117	107	123	166	32
Unknown	41	45	14	16	3
Total # Households	1,154	1,985	2,072	2,537	918



According to the DES, the average household throws 15.5 pounds of hazardous materials into the trash each year. Hazardous wastes include materials that are toxic, flammable, corrosive, or reactive. Flammable or reactive household chemicals can release toxic fumes or even explode if mixed together in the trash, causing fire or injuries. Disposing of materials in landfills or septic systems may contaminate groundwater and surface waters, ruin drinking water, and kill fish and wildlife.

All hazardous wastes accepted at the collection program have been either disposed of or recycled. By far, the type of waste most collected is paint, stain, and varnish. Special containers for paint cans called waste wranglers are filled and sent off site to be recycled into new paint. A variety of other products including chemical labpacks, alkaline labpacks, acid labpacks, fluorescent bulbs, and household batteries are collected. The remainder has to be safely disposed of by the contractor, Safety-Kleen. The center does not have a product re-use program; however the Solid Waste District should revisit how such a program might operate in the future.

The quantity of waste collected has steadily increased since the permanent facility opened. This is attributable to the significant increase in participation witnessed over the tenure of operations. Based on the results of strong participation and the large amounts of hazardous materials removed from the waste stream, the household program is considered to be a solid success.

In conclusion, the majority of the District does not have the sorting or baling equipment necessary to capture the most profitable markets for paper and product containers. Paper and corrugated cardboard is projected to continue as the dominant material in the MSW. The market price is almost double for baled products. It is recommended that each community utilize the free technical assistance available from a variety of sources to analyze tonnage, equipment, and site upgrades. The recommendations for a long term plan for recycling should be addressed in the capital improvement plan.

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Chapter IV

Recycling Facilities and Capital Costs

This chapter will examine the individual recycling facilities in the Nashua Region Solid Waste Management District (District) on a town-by-town basis, and comparable size towns in the state and throughout New England.

Souhegan Regional Landfill District

Population: Amherst 10,564, Brookline 3,526, Hollis 6,935, Mont Vernon 2,027

The Souhegan Regional Landfill District (SRLD) budget for the year 2000 is \$845,965, up slightly from the 1999 budget of \$845,765. The town of Amherst will be charged \$346,270, and collected as part of the tax bill. The remainder will be assessed to, and paid by, the other towns in the SRLD. The assessments for Capital Spending are prorated based on total real estate valuation for each town. Assessments for Operations Spending are prorated on the populations of each town. A retained surplus of \$75,400 in the 1999 assessment was applied to the capital account.

SRLD owns all of the equipment used by the four towns of Amherst, Brookline, Hollis, and Mont Vernon. However the maintenance and transport of the containers is contracted out to private haulers. The SRLD fixed assets is listed in the chart below.

Table IV-1

Description	Acquisition Date	Estimated Life	Original Cost	Replacement
Steco trailer	1999	Approx. 15 years	\$5,000	\$5,000-\$5,500/unit
(2) Steco trailers	1998	Approx. 15 years	\$4,800/unit	\$5,000-\$5,500/unit
Steco trailer	1996	Approx. 15 years	\$4,500	\$5,000-\$5,500/unit
(2) Steco trailers	1987	Approx. 15 years	Unknown	\$5,000-\$5,500/unit

Amherst plans to replace two (3-yard) compactors and trash boxes (trailers) this year. Projected costs are \$5,000-\$6,000 per unit for the compactors and \$5,000-\$5,500 per unit for the trailers. Financing for equipment comes from their Equipment Reserve Fund. Site work will cost approximately \$1,000 per compactor. The current capital budget is \$5,000 for site work. The operating budget for recycling in the SRLD is currently \$18,000. Amherst has \$2,575 in their Public Works operating budget and Mont Vernon has set aside \$1,500 for recycling.

REGIONAL RECYCLING PLAN — October 2000

CHAPTER IV: Recycling Facilities and Capital Costs

The SRLD Administration Officer and the town transfer station operator cited the following problems and issues that affect the towns individually or the District as a whole:

- Poor market for co-mingled containers.
- No baling equipment for paper products and containers.
- Difficulty in coordinating the program in 4 towns that have different needs and sites.
- Inadequate space in Amherst to work around the closed landfill.
- Backward traffic pattern in Amherst — recycling is in the back and trash is up front.
- Brookline foresees possible problems with construction debris (C & D) and burning restrictions, brush and clean wood.
- Brookline has a dumping problem due to a poor entrance design.

Town of Merrimack

Population: 24,337

In 1999 the town of Merrimack recycled and marketed almost 1,500 tons of recyclable materials. Approximately \$75,000 of the solid waste budget in Merrimack is allocated to the operating budget for recycling. They have nothing budgeted in the capital budget for the next fiscal year. However, the town has indicated the need for an additional horizontal baler at a projected cost of \$50,000. The Town feels that the recycling site is adequate although the space for landfill expansion is rapidly being used. The following is a fixed asset inventory.

Table IV-2

Description	Acquisition Date	Estimated Life	Original Cost	Replacement
Recycling Building	January 1990	Approx. 45 years	\$344,000	\$434,000
Baler horizontal	January 1990	Approx. 15 years	\$24,900	\$30,000
Baler vertical	January 1990	Approx. 15 years	\$20,800	\$25,000
Lift truck	January 1990	Approx. 15 years	\$6,100	\$7,500
Loader skid	January 1999	Approx. 15 years	\$13,500	\$13,500

REGIONAL RECYCLING PLAN — October 2000

CHAPTER IV: Recycling Facilities and Capital Costs

Town of Milford

Population: 13,078

The town of Milford's operating budget for recycling was \$112,719 in 1999. Operating expenses exceeded this amount by \$27,691. The over expenditure was due to the increased cost of disposal associated with construction and demolition (C&D). However, the revenues received from recycling exceeded the yearly estimate by over \$38,000. The tipping fees were subsequently adjusted to reflect the increased cost of C&D materials. The table below reflects the fixed assets owned by the town.

Table IV-3

Description	Acquisition Date	Estimated Life	Original Cost	Replacement
Recycling Building	1980	Approx. 45 years	unknown	unknown
Recycling Building	1980	Approx. 45 years	unknown	unknown
Tractor w/48" forks	1992	Approx. 15 years	\$23,000	Approx. 30,000
Ford New Holland Backhoe L785	1995	Approx. 15 years	\$54,847	\$65,000
Philadelphia Tramrail/Baler/Compactor 5,000	1980	Approx. 25 years	\$5,000	Approx. \$8-10,000
Reznor Used Oil Heater	1999	Approx. 10 years	\$5,000	\$5,000
(2) Two Box Trailers 45'	1982	Approx. 30 years	\$6,200	Approx. \$7,000
Aluminum Conveyor/Magnet Seperator	1980	unknown	\$12,363	unknown
Inside Sorting Line Dayton Motor	1980	Approx.30 years Motor replaced	\$6,000	unknown
Outside Sorting Feed Canyon	1980	Approx. 30 years	\$5,000	unknown

The capital budget for recycling was \$13,500. The Solid Waste Transfer Station and Recycling Center Manager cited the following problems and issues that affect the operation of the facility:

- Did not expand with population increases
- Needs added storage capability
- Tipping floor needs to be replaced and reorganized
- Need an additional horizontal baler
- Former open burning dump/landfill site

REGIONAL RECYCLING PLAN — October 2000

CHAPTER IV: Recycling Facilities and Capital Costs

City of Nashua

Population: 83,900

The City of Nashua’s capital budget for recycling is incorporated into the operating budget. The FY1999 budget was \$457,000 with bonding potential for specific expenditures. It was immediately apparent to the City of Nashua that even with the new expansion of the recycling center and the addition of a baler, approximately \$3.4 million is still needed for equipment upgrades to increase baling and storage capacity. Like most operations of this size, litter continues to be a problem. The following chart illustrates the City’s fixed assets as of FY2000.

Table IV-4

Description	Acquisition Date	Estimated Life	Original Cost	Replacement
Recycling building	Expanded 1999	Approx. 45 years	unknown	unknown
Baler	2000	Approx. 15 years	\$41,500	Approx. \$43,000
Recycling trucks	1988	< 10 years	Approx. \$50,000	Approx. \$85,000
Recycling trucks	1989	< 10 years	Approx. \$50,000	Approx. \$85,000
Recycling trucks	1990	< 10 years	Approx. \$50,000	Approx. \$85,000
(3)Recycling trucks	1999	< 10 years	Approx.\$79,000	Approx. \$85,000
JVC loader	2000	Approx. 15 years	\$51,000	\$51,000
CAT loader	1999	Approx. 15 years	\$370,000	\$372,000

REGIONAL RECYCLING PLAN — October 2000

CHAPTER IV: Recycling Facilities and Capital Costs

Town of Windham

Population: 10,598

The original bond for the construction of the recycling center in 1989 was 1.3 million and the town paid its last payment this year. The total solid waste budget is \$525,840 with an estimated \$250,000 used for recycling operations. The major hindrance of the Windham facility is the lack of acreage to expand their recycling facility. The town is steadily growing, and storage and operational space, especially for loading docks, is at a premium.

Table IV-5

Description	Acquisition Date	Estimated Life	Original Cost	Replacement
Recycling building 75 X 150	1990	Approx. 45 years	\$1.3 million	\$1.5 million
Baler	1993	Approx. 15 years	\$10,000	\$20,000-25,000
(2) Wauling floor trailers	1989	Approx. 15 years	Included in building cost	
Wauling floor trailers	1999	Approx. 15 years		
Mack tractor	1990	Approx. 15 years	Unknown	
Ford skid steer	1993	Approx. 15 years	\$15,000	\$20,000-25,000
JBC loader	1999	Approx. 15 years	\$50,000	\$52,000
Plastic grinder	1989	Approx. 15 years	Included in building cost	

REGIONAL RECYCLING PLAN — October 2000

CHAPTER IV: Recycling Facilities and Capital Costs

Outside the Nashua Region Solid Waste Management District

Town of Pelham, New Hampshire

Population: 11,034

The operating budget and the capital budget for recycling was \$20,582 in 1999. The Capital Improvement Plan Committee has ranked a solid waste solution as “urgent” due to the age and frequency of equipment problems with the two incinerators acquired in 1977. A \$310,000 warrant article was approved in the spring of 2000 to change the facility to a transfer station. The cost of replacing the incinerator with scrubbers was well researched and it was determined that it is more cost effective to compact the garbage and truck it to a landfill. The bidding process for dismantling the incinerators and adding an addition for trash compactors will begin in September. The recycling center has requested \$275,000 for next year to purchase a baler and add storage space. This may include a tipping floor in the future. Currently there is \$16,000 in the capital reserve fund for recycling equipment and \$48,000 in the recycling building fund.

Table IV-6

Description	Acquisition Date	Estimated Life	Original Cost	Replacement
Recycling building 40 X 80	1977	Approx. 45 years	Unknown	250,000
Recycling building 24 X 60	1977	Approx. 45 years	Unknown	40,000
New Holland skid steer	1999	Approx. 15 years	17,000	20,000
Bobcat skid steer	1993	Approx. 15 years	20,000	23,000
Glass crusher	1999	Approx. 20 years	8,500	10,000
Can separator	1995	Approx. 15 years	6,000	7,5000
(2) Incinerators	1977	Approx. 20 years	Unknown	1.5 million w/scrubbers

REGIONAL RECYCLING PLAN — October 2000

CHAPTER IV: Recycling Facilities and Capital Costs

Town of Walpole, New Hampshire

Population: 3,359

The operating budget for recycling is included in the entire solid waste budget of \$147,000. The capital budget is \$2,000 for the year 2000. The recycling center in Walpole has some severe storage problems. The center could easily double in size and double in efficiency. The following list is the current needs for the facility.

- Two roll-off 30-yard dumpsters — approximately \$2,000 per unit
- One enclosed compactor roll-off — approximately \$4,000
- One 1 ton flatbed truck (4x4) and plow — approximately \$8,000-\$14,000
- One storage shed 45 X 50 with a minimum height of 14 feet — approximately \$30,000
- One wood chipper 12 feet — approximately \$15,000-\$22,000

Table IV-7

Description	Acquisition Date	Estimated Life	Original Cost	Replacement
Recycling building	1993	Approx. 45 years	\$67,000	\$90,000-95,000
Philadelphia down stroke baler	1991	Approx. 15 years	\$5,000	\$10,000-15,000
Bobcat skid steer	1991	Approx. 15 years	\$15,000	\$20,000-25,000
Accurate compactor	1998	Approx. 15 years	\$6,000	\$10,000
Horizontal Balemaster baler	unknown	Unknown	Unknown	\$15,000-20,000
Ford truck	unknown	Unknown	Unknown	\$20,000-25,000

REGIONAL RECYCLING PLAN — October 2000

CHAPTER IV: Recycling Facilities and Capital Costs

Other New Hampshire Communities

Table IV-8

Other New Hampshire Communities — Equipment for Recycling

Community	Population	Year Built	Buildings	Equipment
Keene	23,090	1994	100'x90' 28'x20'	2 horizontal balers, forklift, waste oil furnace, 3 glass crushers, trailer box
Marlborough Roxbury	2,059 257	1992	40'x40' 28'x28'	2 vertical balers, forklift, 2 roll off containers, 3 crushers
Peterborough Sharon	5,686 333	1999	112'x50'	2 horizontal balers, 2 vertical balers, forklift, waste oil furnace, trailers boxes
Greenfield	1,517	1997	150'x12'	Bucket loader, truck for hauling

Chittendon Solid Waste District - Burlington, Vermont

Population: Approximately 40,000

The capital budget for recycling at the materials recovery facility (MRF) is \$800,000 for FY01. The operating budget for the MRF is \$1,120,000 for FY01 (July 00-June 01) of this \$85,000 is slated recycling promotion. The Chittendon Solid Waste District processes approximately 22,000 tons of recyclable materials a year.

Currently the facility has a two stream enclosed sorting systems for fibers and containers. The District is considering the installation of mechanical sorting equipment for fibers and a possible single stream (commingled fibers and containers) at an estimated cost of \$800,000. During poor markets the facility has difficulty with finding labor to sort fibers into the various fiber categories. The only siting issue that the MRF has is the lack of access to rail for shipping processed materials.

Table IV-9

Description	Acquisition Date	Estimated Life	Original Cost	Replacement
Materials Recovery Facility	1993	Approx. 45 years	Approximately \$1,000,000	Unknown
2 stream enclosed sorting system	1993	Approx. 20 years	Included in price above	\$15,000
Two Ram baler	1993	Approx. 15 years	Same as above	\$10,000



In summary, many of the smaller communities around the State have more equipment than most of the District communities with twice the population. For instance, the recycling center that serves the towns of Marlborough (2,059) and Roxbury (257) is similar in size to Brookline (3,526) and Mont Vernon (2,027) and has two balers and three glass crushers. Peterborough (5,686)/Sharon (257) is half the size of Amherst (10,564) and Windham (10,598) and owns two horizontal balers and two vertical balers. The City of Burlington, Vermont (40,000) is half the size as the City of Nashua (83,900) and operates a material recovery system. Although Milford and Merrimack could use an additional baler, the towns are keeping pace with the population and materials recovered. As mentioned earlier, Milford has met the 40% state goal of material diversion. This could be attributed to adequate equipment for sorting and packaging materials for the best market price available and mandatory recycling regulations.

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Chapter V

Advertising, Marketing, and Public Relations

The Nashua Regional Planning Commission (NRPC) coordinates the advertising, marketing, and public relations for the Nashua Region Solid Waste Management District. NRPC has used a variety of advertising techniques to publicize the Household Hazardous Waste (HHW)/Small Quantity Generator (SQG) program since its inception. The success of the program can be attributed to regular publicity, satellite collections, and a consistent day and time for collections. In addition to the types of media listed below, educational displays have been used at Earth Day celebrations, Merrimack Village Water District education events, Nashua River Harvest Festival, and Nashua's Annual Trash Bash. The town of Pelham sent flyers through the school system to announce the satellite collection. In Milford, the satellite collection information was included in a special Earth Day supplement to the Milford Cabinet.

Table V-1
Household Hazardous Waste/Small Quantity Generator Advertising

Type of Media	Press Releases	Refrigerator Flyers	General HHW Information
Town Libraries and Town Halls		X	X
Transfer Stations and Recycling Centers		X	X
City of Nashua Wastewater Bills		X	
Real Estate and Mortgage Companies		X	X
NRPC and Town Websites		X	X
City of Nashua Fire Marshall Inspections		X	X
Bedford-Merrimack Bulletin	X		
The Brookliner	X		
Hollis Times	X		
Hollis-Brookline Journal	X	X	
Hudson-Litchfield News	X	X	
Merrimack News Connection	X		
Merrimack Journal	X		
Stateline X-press	X	X	
Telegraph Publishing Company	X	X	
The Broadcaster	X		
The Cabinet	X	X	
The Union Leader	X		
Windham Independent	X		

Table V-1 (continued)

Household Hazardous Waste/Small Quantity Generator Advertising

Type of Media	Press Releases	Refrigerator Flyers	General HHW Information
TV 13/33 and Nashua Cable 16	X		
Windham Community TV	X		
WFEA - Radio	X		
WGIR - Radio	X		
WHOB - Radio	X		
WMUR - TV	X		
WMVU-Radio	X		
WNDS - TV	X		
WNHQ - Radio	X		
WSMN - Radio	X		
WZID - Radio	X		

The District prepares a one-page publicity sheet that is added to locally delivered newspapers, and other places listed above for a district-wide literature drop in the spring each year. This fact sheet stresses source reduction of HHW, and provides information on collection events. In addition, press releases appear before every collection. According to surveys completed at each HHW event, the flyer inserts and press releases in the newspaper were the highest ranking source of information for local residents participating in the HHW collections. Flyers picked up at public places, signage at the transfer station, television/radio announcements, and word of mouth ranked in descending order of effectiveness as marketing tools.

The Waste Watch Center (now Center for Environmental Communications), a non-profit organization involved in education on matters of waste management, under a grant from the US Environmental Protection Agency has developed a range of outreach and publicity materials. The materials are targeted to help educate small quantity generators about the program. Other groups or organizations that have been involved in promotion include public water distributors, the League of Women Voters, public and private schools, conservation commissions, the Hudson Young Women's League, and scout troops.

The City of Nashua has a focused advertising campaign to encourage recycling, and works with a variety of other organizations to promote the program. Partnerships have included area hospitals, schools, the City of Nashua Recycling Committee, and the Nashua Garden Club. The Annual Trash Bash events organized by the Solid Waste Department and the Nashua Recycling Committee are held at the recycling center each spring to promote recycling and responsible waste management.

REGIONAL RECYCLING PLAN — October 2000

CHAPTER V: Advertising, Marketing, and Public Relations

The Mayor’s Beautify Nashua Project was implemented in 1998 and, as a result of positive community response, has been used as a focal point for other community activities including expansion of the curbside recycling program, and neighborhood cleanup projects.

Although the marketing strategies discussed have contributed significantly to increased public awareness and participation in recycling and waste reduction programs, the role of operators and personnel at recycling centers and transfer stations is a key factor in the success of these programs.

The Northeast Resource and Recovery Association (NRRA) presented The Alvin Munnis Recycling Award to a Solid Waste employee in the town of Merrimack, and, a Merrimack employee was presented NRRA’s Recycler of the Year Award in 1998. Also in 1998, Merrimack hosted the NRRA regional meeting of recycling facility operators. All of these factors demonstrate a steady increase in the success of these programs.

Table V-2

Current Advertising for Recycling

Town	Budget	Solid or Recycling Committee	Brochures	Other Partners	Signs	Welcome to Town Packet
Amherst	None	X	X		X	X
Brookline	None		X	Channel 17	X	
Hollis	None	X	X		X	
Mont Vernon	None		X		X	X
Hudson	None		X		X	
Merrimack	None	X	X		X	
Milford	\$350		X	X	X	
Nashua	\$1500	X	X	X	X	X
Windham	None		X		X	



CHAPTER VI

IMPLEMENTATION ALTERNATIVES AND ISSUES

The alternatives presented in this chapter attempt to demonstrate the relationship between differing recycling methods and other disposal techniques. This section also includes a description of alternate disposal techniques that do not involve municipal involvement such as legislative initiatives and private sector actions. Specific sections in this chapter cover the waste reduction goal of New Hampshire, regional recycling alternatives; mandatory versus voluntary recycling; public education; the relationship between recycling and energy; the issue of a statewide bottle bill; pay-as-you-throw programs, composting and local, state and federal regulatory barriers. It should be underscored that no single recycling program can be uniformly applied to all communities. Each must weigh the positive and negative aspects of recycling and determine the level of recycling activity desired in order to develop a plan. Recycling should be an integral component of a solid waste solution.

WASTE REDUCTION GOAL

The general court declares that the goal of the State, for the period 1999-2000 is to achieve a 40 percent minimum weight reduction in the solid waste stream on a per capita basis. Weight reduction shall be measured with respect to changes in the total waste stream generated. The goal of weight reduction may be achieved through source reduction, recycling, reuse, and composting, or any combination of such methods, with the goal of not disposing of recyclable material in a lined landfill with a leachate collection system. Ash resulting from waste-to-energy technologies (discussed in a later section) or other incineration shall not be subject to further weight reduction. Recycling, reuse, and composting efforts existing as of 1990 shall be considered as counting towards the 40 percent weight reduction goal.

Recycling has been at the forefront of growth in solid waste management, and over the last six years the concept has evolved into a standard business process for commercial and municipal ventures whereby generation, disposal and manufacturing are clearly intertwined and incorporated into day-to-day activities. This is in part due to communities using proven collection method that have been discussed thus far. This is also due in part to recycling market development. In 1997, the state's waste reduction rate was 27%, which is an increase from 21% in 1994, and the per capita generation rate is 2.9 lbs/person/day. It was estimated that if the state remains on this present course, an approximate 31% rate would be achieved by the year 2000. Therefore, implementation of new strategies is needed to achieve the nine-percent necessary to meet the 40 percent goal for the year 2000.



A summary of policy options that can be adopted by local governments to promote solid waste reduction is listed in the report *Nashua Solid Waste System: An Analysis of the Options, Volume 1*, prepared for the City of Nashua by the Tellus Institute in Boston, May 1992. These include:

- Disposal Bans
- Disposal Fee Adjustments
- Flow Control Ordinances
- Litter Taxes
- Procurement Policies
- Product-to-Package Ratios

A full description of each is listed in the report.

REGIONAL RECYCLING ALTERNATIVES

A preliminary evaluation of recycling operations yields the following basic alternatives for consideration in the Nashua region. Sub-alternatives under all three approaches are resident delivery of recyclables versus curbside hauler pick-up and delivery discussed in this chapter. No matter which alternative is selected, complementary waste reduction strategies such as composting, and commercial and industrial recycling, should be employed to the fullest extent possible. Public education is also an element central to the success of all recycling programs.

1. Individual community/regional recycling programs with full separation of materials. The materials collected would be marketed directly by the individual communities.

Under this approach residences and businesses would be responsible for full separation of solid wastes on an individual basis. Critical to the success of such a program would be labor and equipment to prepare marketable products.

2. Individual community/regional recycling programs with on-site separation of materials and delivery of separated material to a centralized District distribution facility.

This approach is basically the same as approach #1 except that separated materials are transported to a central regional storage/marketing facility. Not only is less processing equipment/labor needed at each collection site but communities benefit from cooperative marketing of materials. Additional analysis would be necessary to see whether increased efficiency offsets the cost of hauling materials to a regional facility and the additional labor costs incurred.

3. Simple separation at each community, transportation of recyclables to regional material recovery facility.



In this scenario residences and businesses would be responsible for “simple” separation into three categories: 1) rubbish; 2) all glass, cans and plastic; 3) paper. Simple roll-on/roll-off containers or dumpsters at each community would insure minimal storage, sorting or processing before transportation to a central materials recovery facility (MRF). At the MRF, materials are sorted, processed and marketed. The MRF has the option of baling mixed paper or sorting to several market grades of paper. In the latter, capital and operating costs increase but so does market potential.

This method enables participants to “commingle” their recyclables, or mix all glass, cans, and plastics into one bin. Commingling has been found to increase participation and the volumes recycled. At the MRF, a system of conveyer belts, magnetic separation and manual labor separates the materials and prepares them for their individual markets. While capital expenditures are increased, so are participation rates. MRF is at the heart of the regional systems proposed in Massachusetts and Connecticut. . There is a general consensus among transfer station operators and recycling center personnel that the population in the District could support a MRF. The success of a facility is dependent upon dedicated individuals to push the project forward. The facility in Keene is the result of careful planning and promotion by a dedicated group in that region.

RESIDENTIAL RECOVERY TECHNIQUES

There are four main methods of collecting recyclable materials from the various residential sources in the Nashua region. An effective regional recycling program would need to be responsive to single family homes, multi-family buildings and both urban and rural residents. Although there will naturally be some overlap between the different techniques, experience indicates that certain segments of the population will be reached through one method while others will not. For example, some people will not bother with a curbside collection even if it is well publicized and convenient. For others, the minimal financial benefit of a recycling buy-back center might be all the motivation they need to participate. The level of separation inherent in each method can vary considerably. Each community should carefully consider its own character, the predominant types and density of its residential land uses, and current solid waste disposal practices on exploring the suitability of each of these techniques.

Curbside Collection

Curbside collection is considered the most convenient method of recycling for residents. Pick up of curbside recyclables usually occurs on the same day as trash collection adding motivation to recycle.

Integrating curbside collection and recycling has met with varies degrees of success in programs across the country. To be most effective, curbside recycling is usually dependent on financial commitment from governmental authorities, capital expenditures relating to collection equipment and cooperation from commercial haulers. There are essentially three methods of curbside collection.



- **Source Separated**, in which the homeowner places recyclables, separated by type, at the curb and the collection crew deposits them into separated compartments on the truck;
- **Curbsort**, in which the homeowner places mixed recyclables at the curb and the collection crew sorts them into separated compartments on the truck; and
- **Commingled**, in which the homeowner places mixed recyclables at the curb and the collection crew hauls away unseparated.

A major impact on collection efficiency and collection cost is affected by how materials get out of houses and are prepared for collection. In a number of recycling programs, especially those that benefit from state subsidies, special recycling storage containers have been developed for home use. The containers are either bins made from recycled plastics or textile bags which, depending on the available funding and collection program characteristics allow residents to separate newspaper, glass, metals and plastics.

The purpose of the containers is to increase the long-term willingness to recycle by decreasing the inconvenience of recycling and making source separation a habit. The containers, often color coded to separate materials, should be lightweight, stackable and with adequate handles and drainage holes.

Additional expenditures associated with curbside collection recycling may result from the need to purchase specialized recycling vehicles or from changes made to existing garbage trucks to accommodate recycling. There are a number of specialized multiple bay recycling vehicles in use in the U.S. and Canada which offer high collection efficiencies, low capital costs and low operation costs when compared to traditional garbage trucks.

Many recyclable materials are landfilled due to the reluctance of haulers (commercial or public) to separate materials. Especially for commercial haulers, the economic benefits to reduce the amount of recyclable in the landfill are marginal. Full separation by commercial haulers is generally considered difficult or unfeasible but separation of certain targeted materials may be more easily attainable. Some commercial haulers, however, have become involved in the ownership or operation of private recycling centers.

Various approaches are being used across the country to encourage haulers to work closely with their customers to ensure maximum source separation of recyclable materials. Some facilities offer a discount or free use of a transfer station provided a certain amount of recyclables are donated. In other cases, authorities ban the disposal of significant amounts of certain materials such as corrugated cardboard or ban the dumping of any loads, which contain significant percentages of such materials. Recycling participation has also been encouraged by variable collection rates where generators are charged for collection, allowing haulers to pass on their disposal costs. Under this system, collection fees are devised on an incremental basis. Some areas with automated collection systems weigh each garbage can as it is deposited in the truck with the customer billed accordingly. Others establish standard can sizes and customers are billed accordingly to the size can they choose. Sometimes, second can rates are set artificially high.



Currently, 38 New Hampshire municipalities fund curbside recycling for all or some portion of their residents (a total of 436,301, 39%, of New Hampshire's population). In the Nashua Region Solid Waste District, Hudson and Nashua are the only communities with curbside recycling. Hudson commingles everything and BFI transports the materials to the MRF in Hooksett, New Hampshire. Nashua sorts at curbside. Nashua is in the process of evaluating this system and looking at alternatives such as separating at Four Hills. Many residents in other municipalities have the opportunity to have curbside recycling if they fund it themselves. The convenience factor clearly increases participation rates.

Resident Drop-Off

Drop-off recycling centers are ideally suited to serve residents who do not receive curbside service and who are already accustomed to bringing their trash to local disposal sites. At drop-off collection and transfer facilities recycling can generally be separated into more categories than is possible with curbside collection. Where disposal fees are charged, recyclables should be exempted or variable fees should be considered.

If not enforced by a mandatory recycling ordinance, drop-off centers commonly fall prey to the convenience factor whereby those closest to the center tend to recycle while others do not. However, transfer station operators all agree that once residents are used to recycling, they will continue to do so.

Drop-off collection at local disposal facilities may also be supplemented by secondary drop-offs for a specific purpose such as collection of beverage containers in a factory, offices or schools. Drop-off facilities at malls or in the parking lots of banks have also met with some success in targeting limited specific recyclables. Buy-back soda can dispensers are also being tested in some areas.

Multi-Family Dwelling Collection

In most recycling programs, collection of recyclables from multi-family dwellings is at a significantly lower rate than from single family residences. Multi-family programs require a different design and implementation strategy due to differences of the population and the physical setup.

Most often multi-family recycling programs utilize drop-off depots and storage containers to allow apartment/condo residents to deliver materials in a convenient manner – near the parking lot, in a common area near laundry facilities or dumpsters, etc. Cooperation with the management of a building would be critical to efficient storage and collection. Resident volunteer coordinators may be useful for on-site supervision.

In general, residents in multi-family buildings are reputed to be less inclined to recycle due to their greater mobility and the lack of space in apartments for storage of recyclables. Provision of an on-site facility for apartment/condo dwellers would go a long way in meeting their needs while generating large volumes of material relative to the expense of collection.

Buy-Back Centers

In some instances buy-back centers have offered cash payments for particularly valuable materials such as aluminum or plentiful materials such as newspaper. Ideally, such a facility would be in a convenient location and purchase a full range of materials, which make economic sense for the operator. The buy-back method is also well suited to encouraging paper and aluminum can drives.

COMMERCIAL AND INDUSTRIAL RECYCLING

Commercial and industrial recycling of specific materials can be a major element of a recycling program. Because commercial and industrial enterprises tend to generate large volumes of specific material, these items can be removed from the waste stream directly at the source. In areas such as Nashua, where large concentrations of commercial and industrial uses exist, the quantities of a specific type of waste product are often sufficient to justify collection by a materials dealer or recovery firm. In this manner, such wastes do not enter the overall waste stream and the municipality incurs no disposal costs. Waste generated by commercial and industrial establishments is also often valued for their high level of purity.

The primary focus of commercial and industrial recycling is for paper products. Surveys have shown that up to 70% of the waste generated by office buildings is made up of paper. Waste paper generated from office buildings also tends to be mostly high quality office paper, which can be readily recycled into new paper and other products. Commercial establishments such as retail centers also generate substantial amounts of paper in the form of cardboard. Larger establishments in the Nashua area already recycle cardboard through private contractors. As with office paper, cardboard has been recycled for a number of years and has long established markets and processing specifications.

A less commonly recycled material is plastic scrap generated as an industrial by product. As discussed in Chapter IV, plastic manufacturers are extremely sensitive to contaminants in recovered plastics. Many firms will not accept recovered plastic from the general waste stream. As with paper, many manufacturers already arrange for plastic scrap to be recycled through private means. While a number of commercial and industrial establishments already participate in the recycling of one or more materials, other potentially recyclable materials are not normally recovered. Large retail outlets, malls and urban centers, for example, may collectively generate large quantities of glass, packaging materials and other items that could be recovered in ways similar to plastics and paper. Restaurants, in particular, are large generators of glass, cans, and plastic containers.

A voluntary recycling program for commercial wastes will contribute to the overall reduction of the waste stream while recovering large quantities of relatively homogeneous, quality materials. For recycling initiatives of this nature to remain successful, however, a steady market for the material would have to exist. Employers must weigh the benefits of recycling recovered materials against the time and labor involved in separating, storing and marketing these resources. Informational programs are also necessary to make commercial and industrial establishments aware of potential markets and of cooperative approaches to recycling which may improve the marketability of specific materials.

MANDATORY versus VOLUNTARY

Communities must weigh the pros and cons of both mandatory and voluntary recycling programs. The success of any recycling effort hinges on cooperation, understanding and commitment by residents and local officials. Research indicates that programs that are mandatory consistently achieve higher participation rates. In order to implement a mandatory recycling program, a town has to pass a local ordinance, which require residents to recycle certain materials. In some cases, the ordinance is strictly enforced-in others, it is an encouragement. The Souhegan Regional Landfill District recommended adopting a mandatory recycling program to its member towns. The Town of Hollis voted not to support this effort citing the difficulty in enforcement. It should be noted that an ordinance could specify which items must be recycled and a fee schedule for fines. The final step is usually the revoking of the privilege to use the facility. The recycling centers contacted stressed that the problems have been very minimal. The communities in the Nashua District have not had to go beyond a verbal warning since the adoption of mandatory recycling. Currently, seven towns in the District have voluntary recycling programs. The two that have mandatory programs are Milford and Windham. It should be stressed that mandatory ordinances that are not part of a total package including public education and convenience to residents cannot be expected to reach these participation rates.

As many communities have found, the significant financial and labor outlays which accompany the start-up of a recycling program necessitate passage of a mandatory ordinance to insure that volumes of recyclables will be maintained over the long run and the community's investments will be protected.

EDUCATION/PUBLIC AWARENESS

The success of any recycling program will be dependent on a variety of factors including markets and collection techniques but the key to long term success is a high and sustained level of participation. Education must go hand in hand with recycling. Commitment to recycling requires people to change their habits and in order to maintain levels of participation people must believe in recycling. An on going quality public information and education program is critical to produce an informed support base and to make recycling a household word. Nor should it be assumed that mandatory ordinances could take the place of public education. Any recycling effort that does not integrate public outreach will be plagued by unpredicted levels of participation and possibly doomed to failure. Outreach programs geared toward residents, consumers, students and businesses would help participants to understand the problem and identify solutions. Some specific programs are discussed in a report, *Nashua Solid Waste System: An Analysis of the Options, Volume 1*, prepared for the City of Nashua by the Tellus Institute in Boston, May 1992. Local media brochures, fliers, and town meetings should be utilized to explain the benefits of recycling, how it will be implemented locally and provide status reports on facility operations.

Many New Hampshire schools have superior recycling programs. The City of Nashua has a recycling program in the entire school system. Individual schools in the rest of the District also participate. The key is starting education early so it instilled at an early age and having a dedicated recycling coordinator in every facility.

PAY-AS-YOU-THROW TRASH DISPOSAL

Pay-as-you-throw (PAYT) programs provide a direct economic incentive for residents to reduce the amount of waste they generate because households are only charged for the amount of waste they throw away—in the same way that they are charged for electricity, gas, and other utilities. Nearly 2,000 communities across the country have begun using this program. However, no communities in the District use this approach.

PAYT programs in New Hampshire work on a per container basis: households pay for each bag of waste they generate. In all but one program, residents can recycle for free. As a result, residents are motivated to not only increase the amount they recycle, but also think about ways to generate less waste in the first place.

For community residents, one of the most important advantages of PAYT may be the fairness and greater control over costs that it offers. Under PAYT, everyone pays only for what they throw away and, consequently, they are indirectly rewarded for recycling. This is a big issue in Merrimack at the moment. The commercial haulers are charged to dump and the residents are not. Commercial businesses argue that they pay taxes too. A PAYT program would actually work very well in Merrimack. New procedures will have to be initiated with closure of the landfill in 2002 so the initiation of the PAYT Program could coincide with the closure. The town has a high recycling rate for residents but not for commercial businesses. The commercial dumping has actually brought the recycling rate for the recycling center as a whole down. This would be the most economical and fair approach to solid waste and recycling for everyone. The national average is 10 percent waste reduction but the increased recycling on the part of the commercial sector and reluctant residents should increase the overall-recycling rate around 15 percent according to the facility supervisor.

The City of Nashua may also be a good candidate for the PAYT Program because of the number of apartment buildings. There are 23 complexes with 25 or more units for approximately 2,400 people. Although it is more difficult to sort and store this represents a population the size of Mont Vernon. The collection system would not change; the residents would just need to be educated on the locations where the specialized PAYT bags can be purchased. The capital saved could be used for equipment and storage upgrades needed for recycling at the Four Hills Landfill.

The town of Peterborough established a study committee to review the benefits and downfalls of the program in 1998. A series of Public Hearings were held to gather input and at Town Meeting in 1999, voters decided to use the program. The committee researched the type and size of bags that would be used and convenient locations where the bags could be purchased. The Town has been recycling since 1977, so the concept was not new. In the first two months trash tonnage was down 20 tons each month.

The City of Portland, Maine switched to PAYT in 1999 and realized an average recycling rate of 70%. Communities that are considering this program should also write or amend a Solid Waste Ordinance to include the specifics of the PAYT Program. The City does not have mandatory recycling but has a comprehensive ordinance that includes the following:



- Must use an official bag either 15 or 30 pounds
- Weight limit is 30 pounds
- Services available
- Enforcement procedures
- Codes Department enforces

Nation-wide, municipalities that have adopted PAYT programs have reported a 10 percent greater reduction in solid waste generation. This, in turn, leads to less frequent pick-ups of municipal solid waste and, in most cases, increased participation rates in recycling programs.

Illegal dumping of trash may pose a problem due to resident's unwillingness to pay for each container of waste they generate. Lower income residents could possibly have a concern of how much they will have to pay per bag. In this case, coupon or voucher programs could help to defray expenses.

Currently, the NH Governor's Recycling Program, with funds from the Environmental Protection Agency-New England, has developed a simple computer program called *PriceSetter*. The program is designed to assist municipal communities with either a drop off or curbside waste collection program to calculate a "Price Per Unit" for a volume-based (bag, sticker, etc.) PAYT program. The program targets communities that have a population under 50, 000.

Using data a community already has on hand, this software will provide the user with the ability to increase or decrease solid waste variables, such as tipping fees, hauling fees, or waste reduction rates and, consequently, produce various PAYT price estimating scenarios over a period of five years.

PriceSetter will prompt the user for municipal specific information throughout the program. A "How To" Guide, as well as, the website, www.pricsetter.org, will have detailed instructions and numerous examples. The software is expected to be out by fall, 2000.

COMPOSTING

Composting is based on a natural process of decomposition by thousands of tiny microorganisms that live in the soil. The primary decomposing organism is bacteria, along with fungi, worms and beetles. They feed on organic waste materials such as leaves and left over food. As a result of the breakdown of these materials is compost or humus, a dark, nutrient rich soil fertilizer. Composting is an easy and efficient way of recycling organic material back into the soil.

Composting reduces the amount of material that is usually destined to landfill sites. Kitchen and yard trimmings comprise 30 percent of residential solid waste. Composting leaves, pine needles, grass, and certain food leftovers, in addition to recycling newspapers, glass and plastic can cut the waste stream almost in half.



Some residents may not choose composting as an extension of recycling because of the smell associated with decomposing waste. Also, residents may view a compost pile not aesthetically pleasing in their backyard. There are many types of containers on the market now that conceal the contents and cut down on the amount of space needed for composting. The Garden Club in Nashua in conjunction with the recycling center sold containers at cost to residents. The campaign was very successful and expected to continue in the future since compost is not available from the city.

LOCAL, STATE AND FEDERAL REGULATORY BARRIERS

There are almost always barriers when attempting to develop a program that is suitable for all participants. One local barrier may be reluctance by local officials to initiate programs that may be perceived as expensive. For example, the Town of Hollis decided that requiring mandatory recycling would be unenforceable without acquiring extensive labor costs.

One other significant barrier is the economics of collection and marketing of materials. Nashua currently has curbside collection. The method is effective; however, it is associated with high costs. In order to encourage higher participation, easier methods of recycling need to be established. Do to so, labor costs must be considered. Drop off is less costly, but more space and sorting equipment within the facility is then needed.

The marketing of recycled products is also a barrier. All plastics could be recycled, but there are certain types that are more marketable. Fluctuating markets may require longer storage of materials to cover the transportation cost and realize a profit. This leaves less storage area for more profitable products.

CONCLUSION

No matter which alternative selected, strategies such as the ones illustrated in this chapter should be employed to the fullest extent possible. These include:

- Individual community/regional recycling programs with full separation of materials. The materials collected would be marketed directly by the individual communities.
- Individual community/regional recycling programs with on-site separation of materials and delivery of separated material to a centralized District distribution facility.
- Simple separation at each community, transportation of recyclables to regional material recovery facility.
- Curbside collection that is source separated, sorted on the curb, or commingled.



- Multi-Family dwelling collection
- Buy-back centers
- Increased commercial and industrial recycling
- Initiate mandatory recycling
- Increased public awareness
- Pay-As-You-Throw trash disposal
- Increased composting

The success of any recycling program will be dependent on a variety of factors, including markets and collection techniques, but the key to long term success is a high and sustained level of participation.

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Chapter VII

Conclusions and Recommendations

The New Hampshire state goal for weight reduction in the solid waste stream is 40 percent by the year 2000 (RSA 149-M:2). This means that the State must divert and reduce 40 percent of the municipal solid waste (MSW) from landfills and incinerators. During the last two years, significant strides have been made by New Hampshire communities to increase the recycling rate from 21 percent in 1994, to 27 percent in 1997. According to the DES waste Management Bureau the State is currently achieving an approximate diversion rate of 29 percent. This is below 1998 "Solid Waste Report to the Legislature", projections that the State should achieve a solid waste reduction of approximately 31 percent by the year 2000.

To assist in reaching the 40 percent recycling rate, the DES, along with the Northeast Resource Recovery Association, the Governor's Recycling Program, and the New Hampshire Business and Industry Association (Wastecap Program), provide training and technical assistance. These organizations provide workshops, conferences, newsletters, site visits, and training for municipalities and businesses to increase awareness and knowledge of recycling markets and increase efficiency of recycling centers and transfer stations. In addition, DES's Solid Waste Operator Training Program provides specific information for increasing individual recycling rates. Training includes, but is not limited to, diversionary activities such as composting, and best management practices to preserve market value relative to contamination and waste storage issues.

The New Hampshire the Beautiful, Inc. is a non-profit Charitable Trust sponsored primarily by the soft drink and beverage industry to increase recycling instead of initiating a bottle bill. The Trust has an annual budget of \$50,000-\$60,000 for purchasing recycling equipment. There is a required 50 percent match by the community. Preference is given to communities that are able to share and /or maximize the efficiency of the equipment.

There are a number of measures proposed or underway in the State to address any shortfall diversion which may occur in the year 2000 such as developing the Pay-As-You-Throw (PAYT) Program, streamlined solid waste rules, recycling market development, improved data collection, residential and commercial composting, and surcharges on waste tonnage on both in-state and out of state sources. The remainder of this chapter will focus on specific recommendations for communities in the Nashua Region Solid Waste Management District.

Recommendations for the Entire District

- Arrange to have a site review by personnel from DES, the Governor's Recycling Program, and NRRRA to maximize efficiency, storage potential and effective signage at transfer stations and recycling centers. New Hampshire the Beautiful, Inc. offers free, professionally produced signs for solid waste facilities and provides free technical advice.
- Site operators and administrators should be encouraged to seek technical assistance from the organizations listed above to determine what type of equipment would increase recycling. This would include what is economically feasible, based on tonnage, storage, and size for each community.
- Obtain a copy of the Governor's Recycling Program software for the "Pay as You Throw" program to be released in the fall of 2000. The free software may be used by communities to determine a price to market trash disposal bags to residents to recover all or a portion of solid waste disposal costs. This Program has demonstrated recycling increases and reduced disposal costs. A study group should be formed and public hearings conducted to receive community input on the Program. A warrant article would need to be prepared for Town Meeting.
- Research the files to make sure all equipment is insured for replacement value. The town of Littleton recently had a fire at the recycling center and discovered that between \$40,000 and \$60,000 worth of equipment was not covered by insurance.
- All Solid Waste employees should attend DES's Solid Waste Operator Training Program to become familiar with the Universal Waste Rules now in effect but not officially adopted. Transportation of any universal waste and household hazardous waste is required to take place in an official vehicle operated by DES trained personnel.
- The District should take advantage of State contracts for fluorescent bulbs, Ni-cad batteries (free), and anti-freeze now considered Universal Waste and can be accepted at transfer stations and recycling centers. These programs will decrease disposal costs. Entirely fill the containers provided since the cost is based on the container.
- Increase community involvement in District meetings and decision-making processes. A representative of a waste or recycling committee, and the transfer station manager, should attend all of the District meetings.
- Involve Parks and Recreation, and Conservation Commissions in recycling on public property.
- Towns that have DPW trash pickup at ballfields, parks, and beaches, etc. should use recycling containers that are clearly marked, such as the PET for aluminum.

- Each community should consider developing a publication containing recycling guidelines, vendor locations, and information, in conjunction with the Solid Waste and/or Recycling Committee, and the business sector. Merrimack has developed a guideline that could serve as a model for other communities in the District. Information should be maintained and updated annually.
- Better signage and storage for household battery disposal is needed in most communities. Create displays of recyclable batteries (enclosed in plexiglass) to inform the public regarding proper recycling practices for specific battery types.
- All communities should track waste oil amounts collected, and use the DES Oil Recycling Program to assess the viability of used oil burners at town facilities. The District could have centralized collections to serve a centralized used oil-burning installation.
- Expand the compost program created by the City of Nashua and the Nashua Garden Club to the rest of the District. Community garden clubs could coordinate the sale of the bins to residents. The bins are available at cost for \$35.00

Recommendations for the Souhegan Region Landfill District

- Should consider purchasing the portable glass crusher available from New Hampshire the Beautiful, Inc for approximately \$5,000-6,000. Crushed clear glass commands a better market price than commingled containers. Mixed crushed glass can also be used for backfill of pipes and culverts. This would save money spent on gravel for construction projects. Crushed glass has proved to be an excellent substrate for sidewalks to prevent frost heave. Preference is given to regional districts such as the Souhegan District with an estimated population of 23,052.
- Should consider separating aluminum cans from co-mingled materials in Amherst and Hollis on a trial basis. Put the dumpster next to the commingled dumpster as a reminder that the community is collecting aluminum. This will cut disposal costs and produce income for the towns. Aluminum is currently \$1,000 a ton. The individual towns should consider purchases or equipment upgrades with the revenue generated from the sale of aluminum. Public hearings and warrant articles would need to be prepared in time for Town Meetings in March 2001 if the revenue is not going to general town funds. If there is sufficient volume, the District should consider purchasing a flattener with the revenue from the sale of aluminum and include Brookline and Mont Vernon in separating aluminum.
- The transfer station in Hollis has the space for precast concrete dividers to store separated recyclables or crushed glass. This would create additional space now occupied by commingled containers.

Recommendations for the Town of Merrimack

- Seriously consider initiating the Pay-As-You-Throw Program to coincide with the closure of the landfill. The revenue generated could help defray the cost of purchasing compactors and tipping charges. The residents will have to be educated on the new procedures at the transfer station and recycling center. The transition is much smoother if done all at once according to many towns that have changed procedures and site upgrades. This program motivates residents and commercial haulers to increase the amount they recycle, but also think about ways to generate less waste.
- New Hampshire the Beautiful, Inc. has a grant available for 50% of the total cost of equipment. The trend for communities of this size and larger is to use several balers to avoid storing loose materials. Materials can be placed directly into the baler and avoid having to load the materials manually. This saves time and money in the long run. Horizontal balers process more material and range between \$25,000-30,000. The estimated life is 10-15 years for a vertical baler and 15-20 years for a horizontal baler but the cost of a major overhaul every 7 years should be in the capital improvement plan. Grant preference is given to larger towns like Merrimack that can use the equipment to its full capacity.
- Update the recycling booklet created by the Solid Waste Committee in the early 90's. This should be updated annually.

Recommendations for the Town of Milford

- New Hampshire the Beautiful, Inc. has a stationary glass crusher available for approximately \$4,500. Crushed glass can be used highway projects such as back-filling pipes or as a substrate for sidewalks to prevent frost heave. A better market price is available for crushed aggregate glass. Preference is give to larger towns that could use the equipment to its full capacity.
- New Hampshire the Beautiful, Inc. has a grant available for 50% of the total cost of equipment. Should consider including a new baler into the capital improvement plan. The estimated life is 10-15 years for a vertical baler and 15-20 years for a horizontal baler but the cost of a major overhaul every 7 years should be in the capital improvement plan. Down stroke vertical balers range between \$10,000-15,000 new. A Horizontal baler is recommended due to the amount of material processed. A new baler ranges from \$25,000 to \$30,000. Grant preference is given to larger towns that can use the equipment to its full capacity.

Recommendations for the Town of Hudson

- Consider initiating a used oil program with a grant from Department of Environmental Services (DES). The DES issues gift grants (not matching grants) in the amount up to \$2,500 for the purpose of establishing or improving a used oil collection center. This program includes a \$10,000 fund to pay for disposal of contaminated used oil. Residential used automotive oil could be collected at the old Highway facility in conjunction with the monthly bulk collection. This facility is staffed on collection days and securely locked at all other times. The staff could inspect the oil prior to filling the tank to avoid contamination. Another option is to install a used oil burner at the new highway facility.

Grant monies can be used for the following:

- Spill containment and spill kits/sorbents
- Contamination test kits
- Used oil burners
- Filter crushers and transfer pumps
- A protective shed, funnels, fill gauges
- Promotional and educational materials

The grant money can be used for the following estimated costs for building an outdoor collection center at the old landfill:

500 gallon double-walled fiberglass tank	\$1,200.00
Steel pipe	\$ 100.00
Tank gauge	\$ 75.00
Cement for secondary containment	\$ 200.00
Lumber and roofing material	\$ 350.00
Weatherproofing stain	\$ 75.00
Oil sampling kits	<u>\$ 100.00</u>
Total	\$2,100.00

- Consider initiating a composting program at the old landfill to cut down disposal costs with Browning Ferris Industries. This material could be used for landscaping by the highway department and residents. A separate collection for diversion of food wastes from the MSW for composting could be negotiated in the next contract.

- Run videos such as Massachusetts Department of Environmental Protection's "Home Composting; Turning Your Spoils to Soil" and the New Hampshire Governor's Recycling Program/University of New Hampshire's "How to Compost" on local cable access channels.
- Use cable to advertise composting workshops given by the Natural Resources and Conservation Service, garden clubs, Beaver Brook Association, etc. Publicize locations where residents can purchase composting bins at nominal cost.
- Use local cable access channels to advertise the hours of operation and specific materials accepted at the monthly bulk collections.

Recommendations for the City of Nashua

- New Hampshire the Beautiful, Inc. has a stationary glass crusher available for 50% of the total cost of manufacturing for a town wishing to use crushed glass for highway projects or to receive a better market price for aggregate glass. Preference is give to larger towns that could use the equipment to its full capacity.
- New Hampshire the Beautiful, Inc. has a grant available for 50% of the total cost of equipment. The trend for communities of this size and larger is to use several balers to avoid storing loose materials. Materials can be placed directly into the baler and avoid having to load the materials manually. This saves time and money in the long run. Horizontal balers process more material and range between \$25,000-30,000. The estimated life is 10-15 years for a vertical baler and 15-20 years for a horizontal baler but the cost of a major overhaul every 7 years should be in the capital improvement plan. Grant preference is given to larger communities like Nashua that can use the equipment to its full capacity.

Recommendations for the Town of Windham

- New Hampshire the Beautiful, Inc. has a stationary glass crusher available for approximately \$4,500. Crushed glass can be used highway projects such as back-filling pipes or as a substrate for sidewalks to prevent frost heave. A better market price is available for crushed aggregate glass. Preference is give to larger towns that could use the equipment to its full capacity.



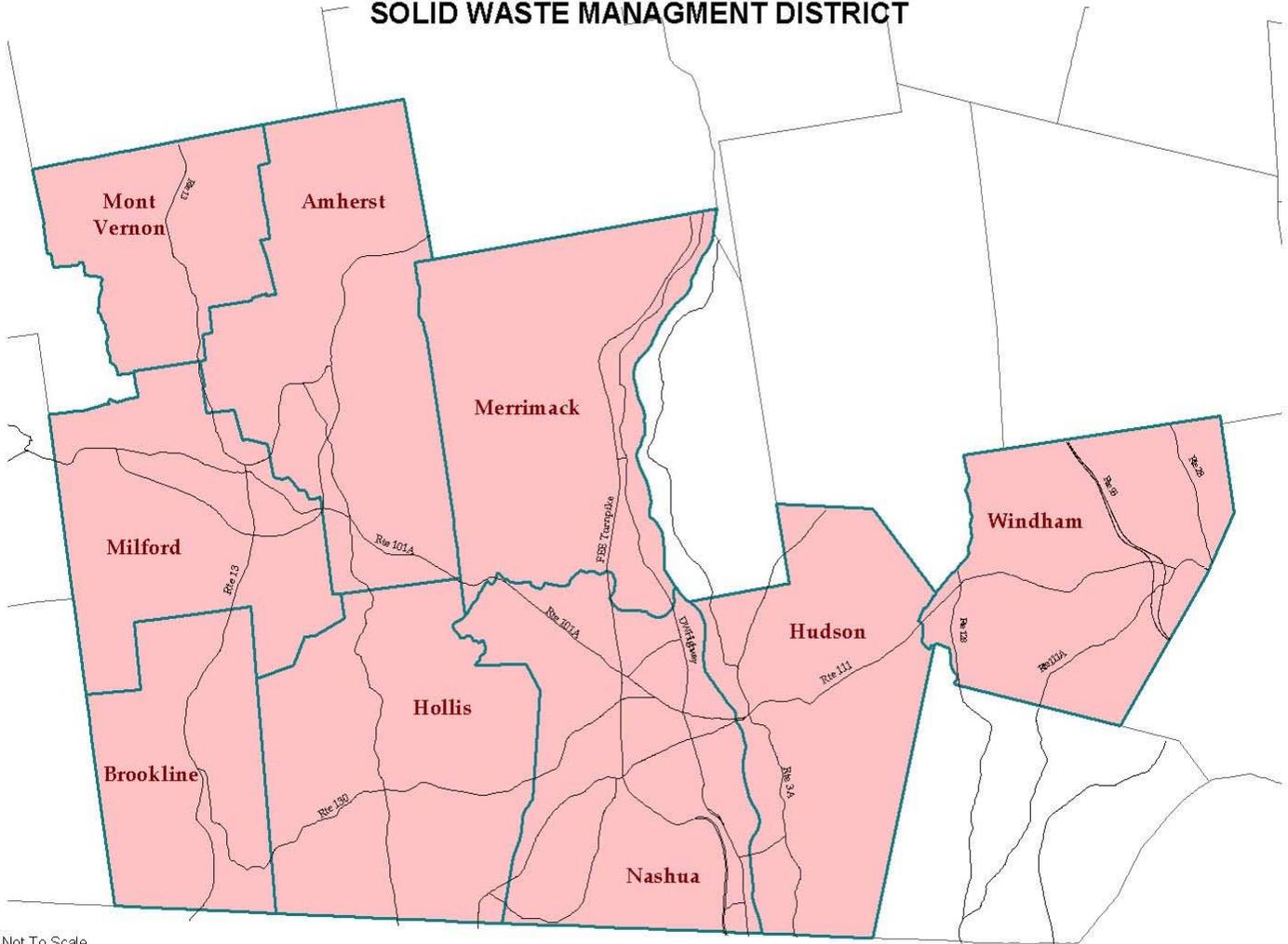
NASHUA REGIONAL PLANNING COMMISSION

REGIONAL RECYCLING PLAN — October 2000

APPENDIX

APPENDIX

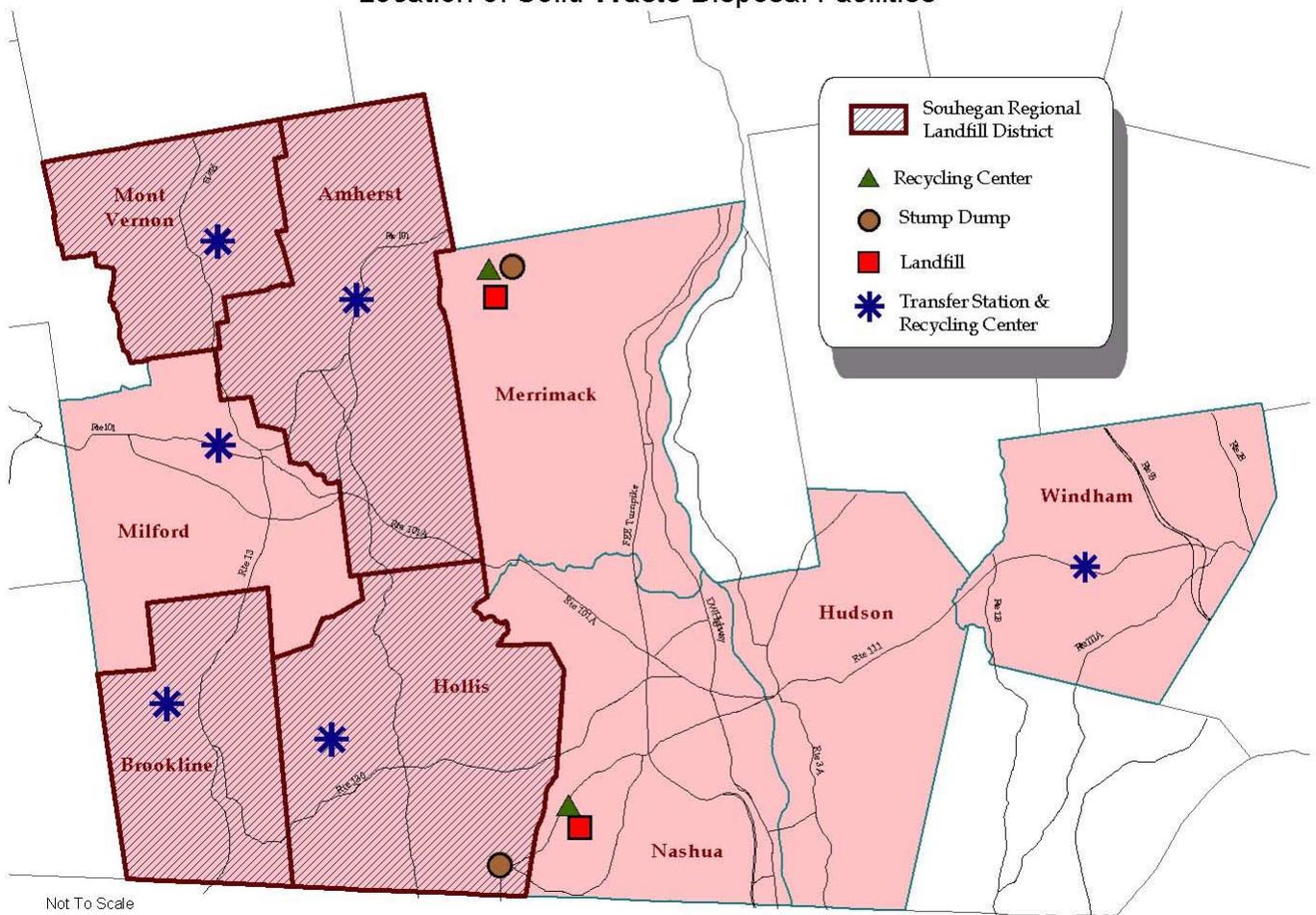
NASHUA REGIONAL
SOLID WASTE MANAGEMENT DISTRICT



Not To Scale
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APPENDIX

NASHUA REGIONAL SOLID WASTE MANAGEMENT DISTRICT
Location of Solid Waste Disposal Facilities



Not To Scale
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Town of Amherst
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Amherst NH 03031

Judith Jones
14 Thorntons Ferry, I
Amherst NH 03031

Jack Kunkle
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Amherst NH 03031

Russell Heinselmann
Town of Brookline
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Brookline NH 03033

Rich Bobich, Chairman
Souhegan Region Landfill District
19 Pepperell Road
Brookline NH 03033

Arthur LeBlanc
Town of Hollis
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Hollis NH 03049

Kevin Burns
Hudson Highway Department
2 Constitution Drive
Hudson NH 03051

Paul Sharon, Town Administrator
Town of Hudson
12 School Street
Hudson NH 03051

Warren Duprat
Litchfield Solid Waste Division
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Litchfield NH 03052

Earle Chesley, DPW Director
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Town of Milford
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Tammy Scott
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