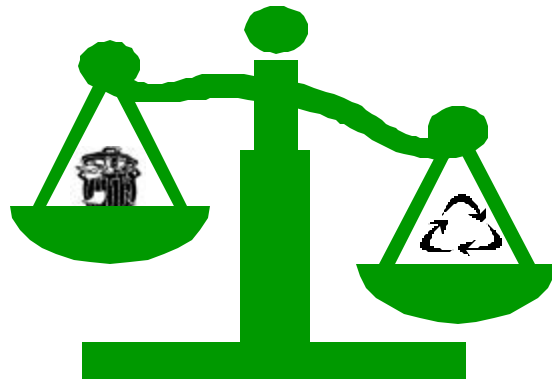


STATE OF CONNECTICUT

State Solid Waste Management Plan Amended December 2006

Gina McCarthy, Commissioner



Changing the Balance



State of Connecticut
Department of Environmental Protection
79 Elm Street
Hartford, Connecticut 06106-5127
www.ct.gov/dep

Pursuant to Connecticut General Statutes Section 22a-228 and Section 22a-228-1(b) of the Regulations of Connecticut State Agencies (RCSA), the State Solid Waste Management Plan has been amended. Pursuant to RCSA Section 22a-228-1(b)(8), notice of this amendment was provided on December 20, 2006. The effective date of the Amended State Solid Waste Management Plan shall be December 20, 2006.



Gina McCarthy
Commissioner
Connecticut Department of Environmental Protection

Dated: December 20, 2006

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**STATE OF CONNECTICUT
SOLID WASTE MANAGEMENT PLAN,
Amended December 2006**

Table of Contents

EXECUTIVE SUMMARY.....	ES-1
CHAPTER 1 INTRODUCTION	1-1
1.1 Purpose of the Plan	1-1
1.2 Statutory and Regulatory Authority for this Plan	1-1
1.3 The Adoption Process	1-1
1.4 Solid Waste Management Plan Consistency Requirements	1-2
1.5 Solid Waste Planning Framework	1-2
1.6 Variables Potentially Impacting Solid Waste Management	1-6
1.7 Plan Contents	1-7
CHAPTER 2 CURRENT CONDITIONS AND PRACTICES: CONNECTICUT AT A CROSS ROADS.....	2-1
2.1 Overview	2-1
2.2 Solid Waste Generation and Management Practices in Connecticut	2-2
2.3 Waste Projections	2-16
2.4 Key Factors Affecting Solid Waste Management in Connecticut	2-18
2.5 Addressing Key Issues That Will Determine Connecticut's Future Directions.....	2-20
CHAPTER 3 FROM WASTE MANAGEMENT TO RESOURCE MANAGEMENT: A LONG-RANGE VISION FOR CONNECTICUT	3-1
3.1 Vision Statement	3-1
3.2 Guiding Principles.....	3-2
3.3 Goals	3-4
CHAPTER 4 MOVING TOWARDS CONNECTICUT'S VISION: OBJECTIVES AND STRATEGIES	4-1
4.1 Overview	4-1
4.2 Projected Connecticut Solid Waste Generation and Disposal: the Framework for the Plan.....	4-3
4.3 Objectives And Strategies	4-6

4.3.1 Objective 1 - Source Reduction..... 4-7
4.3.2 Objective 2 – Recycling and Composting 4-16
4.3.3 Objective 3 – Management of Solid Waste Requiring
Disposal 4-37
4.3.4 Objective 4 – Management of Special Wastes and Other
Types of Wastes 4-49
4.3.5 Objective 5 – Education and Outreach 4-77
4.3.6 Objective 6 – Program Planning, Evaluation and
Measurement 4-82
4.3.7 Objective 7 – Permitting and Enforcement..... 4-91
4.3.8 Objective 8 – Funding 4-97

CHAPTER 5 IMPLEMENTATION CONSIDERATIONS..... 5-1

5.1 Introduction..... 5-1
5.2 Roles and Responsibilities for Plan Implementation..... 5-1
5.3 Public or Private Control of Waste Disposal Facilities 5-9
5.4 Priorities, Estimated Costs, and Timeframes 5-11

LIST OF APPENDICES

APPENDIX A DEFINITIONS AND ACRONYMS
APPENDIX B DATA SUMMARY, VALIDATION, AND ASSESSMENT
APPENDIX C STAKEHOLDER AND PUBLIC INPUT PROCESS
APPENDIX D CURRENT MSW WASTE DIVERSION PRACTICES
APPENDIX E OPTIONS TO INCREASE WASTE DIVERSION
APPENDIX F SOLID WASTE DISPOSAL OVERVIEW
APPENDIX G COST ANALYSIS OF OUT-OF-STATE DISPOSAL OPTIONS
**APPENDIX H THREE AREAS OF OPPORTUNITY IN SPECIAL WASTE
MANAGEMENT**
**APPENDIX I ENVIRONMENTAL IMPACT OF DISPOSAL
OPTIONS**
**APPENDIX J PROJECTIONS OF SOLID WASTE GENERATION AND
DISPOSAL**
APPENDIX K MSW RRF STATUS OF OWNERSHIP

ACKNOWLEDGEMENTS

This Plan is printed on recycled paper.

EXECUTIVE SUMMARY

Introduction

The Connecticut Department of Environmental Protection (the Department or CT DEP) has amended the State Solid Waste Management Plan in accordance with Section 22a-228 of the Connecticut General Statutes (CGS). It replaces the State Solid Waste Management Plan that was adopted in 1991. CGS Section 22a-229 requires that *...after adoption of a state-wide solid waste management plan pursuant to section 22a-228, any action taken by a person, municipality, or regional authority that is governed by this chapter shall be consistent with such plan.* Since the adoption of the 1991 Plan, solid waste management has changed dramatically from mainly a state and local issue to one that is increasingly a regional, national, and global issue.

This new Plan will now serve as the basis for Connecticut's solid waste management planning and decision making for the period fiscal year 2005 through FY2024. The Plan addresses a wide range of solid wastes, focusing primarily on municipal solid waste (or MSW, what is commonly considered household and commercial trash) and debris resulting from construction and/or demolition activities (C&D waste). Though some other special wastes are addressed, hazardous wastes are not covered. The Plan examines the existing state of solid waste management in Connecticut, identifies the problems that exist and the barriers to solving those problems, sets out a vision and goals and presents strategies to help achieve those goals and realize the vision. Within the immediate five-year period, Connecticut will focus on implementing the higher priority strategies listed in the Plan.

In developing this Plan, the Department worked extensively with the public and the specially created CT DEP Solid Waste Management Plan External Stakeholders Working Group. The External Stakeholders Working group included representatives from municipal and government associations, regional solid waste management authorities, the solid waste management industry, the recycling sector, community and environmental groups, and business and waste generating industries. Implementing the Plan will involve all the citizens of Connecticut to address the solid waste issues facing the state and will require not only changes in personal and business practices, but also legislative changes and increases in funding at the state, regional, and local levels to support new and expanded solid waste management programs.

Vision Statement and Goals

Connecticut's long-range vision for solid waste management is to:

- Significantly transform our system into one based on resource management through collective responsibility for the production, use, and end-of-life management of products and materials in the state;

- Shift from a *throwaway society* towards a system that reduces the generation and toxicity of trash and treats wastes as valuable raw materials and energy resources, rather than as useless garbage or trash; and
- Manage wastes through a more holistic and comprehensive approach than today's system, resulting in the conservation of natural resources and the creation of less waste and less pollution, while supplying valuable raw materials to boost manufacturing economies.

The goals of the State Solid Waste Management Plan are:

- Goal 1: Significantly reduce the amount of Connecticut generated solid waste requiring disposal through increased source reduction, reuse, recycling, and composting.
- Goal 2: Manage the solid waste that ultimately must be disposed in an efficient, equitable, and environmentally protective manner, consistent with the statutory solid waste hierarchy.
- Goal 3: Adopt stable, long-term funding mechanisms that provide sufficient revenue for state, regional, and local programs while providing incentives for increased waste reduction and diversion.

Current Status Of Solid Waste Management

Through State legislation, Connecticut has formally adopted an integrated waste management hierarchy as a guiding framework for solid waste management efforts. Connecticut's system adheres to this hierarchy by emphasizing source reduction, recycling, composting, and energy recovery from solid waste, while relying on landfill disposal as a last resort.

MSW

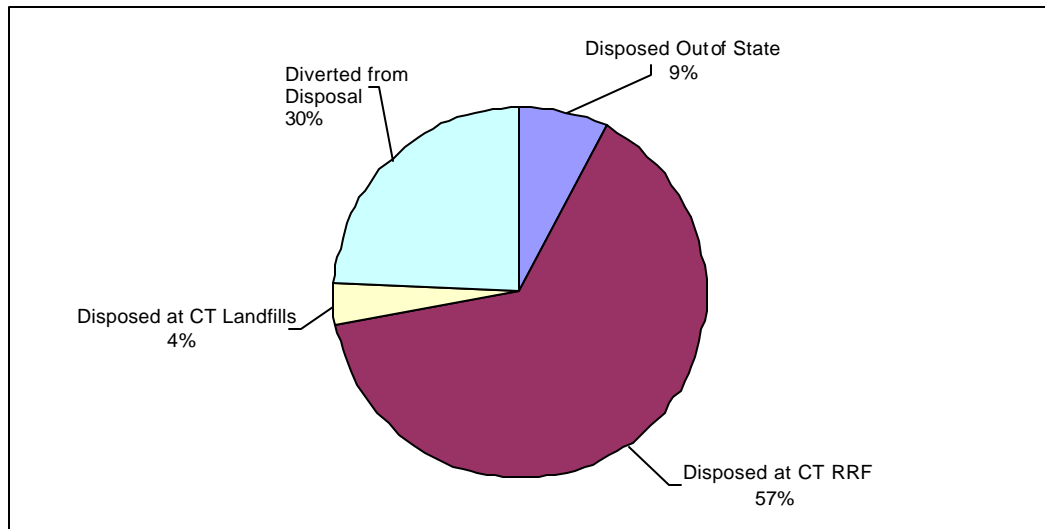
As shown in ES Figure 1, it was projected that in FY2005 approximately thirty percent of the municipal solid waste (MSW) generated was recycled; fifty-seven percent was burned at six regional MSW Resource Recovery Facilities (RRFs); nine percent was disposed out-of-state; and four percent was disposed at in-state landfills. Connecticut is more reliant on waste-to-energy facilities than any other state in the country. This reliance on RRFs results in a significant reduction in the volume of waste ultimately needing disposal at a landfill.

Over the past decade, Connecticut has become more reliant on out-of-state disposal options for MSW (mostly at out-of-state landfills). Since FY1994, out-of-state disposal of Connecticut-generated MSW has increased from approximately 27,000 tons/year to 327,000 tons/year in FY2004. This raises issues regarding inconsistency with the statutory hierarchy, and increased risk due to disposal cost fluctuations and availability.

ES Figure 1

Management of Connecticut MSW, FY 2005; MSW Generated is Estimated at 3,805,000 tons.

(Estimated by R.W. Beck based on FY2003 & FY2004 Data Reported to the CT DEP and Estimates of Non-reported Recyclables)



Through recycling efforts in Connecticut, MSW recycling rates have increased from less than five percent before recycling became mandatory in 1991 to almost thirty percent of the MSW generated in FY2005. This estimate includes non-reported recyclables such as bottle bill material and additional commercial recycling. Composting of yard wastes (leaves and brush) and grass cycling have been successful in Connecticut at both diverting waste from disposal and yielding useful end products. However, composting of other organic materials has been less successful. Consequently, composting of source separated organics remains significantly underutilized in Connecticut. Although recycling and composting have been successful in Connecticut, recycling rates have stagnated over the last ten years. At the same time, the population and per capita waste generation rates have increased. As a result, if waste reduction and recycling efforts are not reinvigorated and if more waste is not diverted from disposal, Connecticut will face an increasing need for disposal capacity at a time when available land is in shorter supply, construction and operating costs are higher, and the public is less willing to accept additional waste disposal facilities.

RRF Ash Residue

The six MSW RRFs in the State generate an average of approximately 551,000 tons per year of ash residue. Two landfills in the State are permitted to accept and dispose of RRF ash residue. The Connecticut Resources Recovery Authority (CRRA) ash landfill in Hartford is estimated to reach capacity and close in October 2008. The Wheelabrator ash landfill in Putnam is estimated to reach capacity and close by FY2018. This is based on a number of assumptions detailed in the Plan, including the following: no new RRF capacity will be built in Connecticut, all Connecticut RRFs will continue to operate, and the Bristol RRF will start sending its ash residue to the Putnam ash landfill after June 2008, when its current contract with a New York state landfill expires.

Construction and Demolition (C&D) Waste/Oversized MSW

Currently, most of the Connecticut C&D waste/oversized MSW is disposed, with only about seven percent (not including clean fill) reported as being recycled. C&D waste recycling occurs at a much higher level in many other states. Connecticut's low recycling rate, coupled with a severe lack of disposal capacity in Connecticut for C&D related waste, results in most of Connecticut's C&D waste/oversized MSW being disposed of at out-of-state landfills. In FY2004, in-state C&D volume reduction facilities (VRFs) and transfer stations (TSs) reported sending approximately 909,000 tons of Connecticut generated C&D waste/oversized MSW to out-of-state landfills for disposal. All but one of the twenty-four remaining active Connecticut bulky waste landfills are municipally-owned, and most serve only their communities. Many are expected to close soon.

Special Waste

A special waste category of increasing concern is electronic waste. Our reliance on computers and other electronic devices, along with the continuing advances in technology, have created a huge increase in the volume of these materials requiring disposal. Efforts have been undertaken to develop a consistent national approach to this issue, but no consensus has been reached. As a result, recycling of electronic waste in this state has been limited to those few manufacturers willing to take back old products and to those few municipalities and authorities willing to conduct costly collection programs. In addition to electronic wastes, the Plan discusses other types of special waste. These include land clearing debris, household hazardous wastes, animal mortalities, road wastes, contaminated soils, dredge materials, sewage sludge, water treatment residual solids, disaster debris, waste treated wood, waste sharps and waste pharmaceuticals.

Projections for MSW, MSW RRF Ash Residue, and C&D Waste

This Plan sets a target to achieve a fifty-eight percent MSW disposal diversion rate by FY2024. Solid waste planning needs to provide strategies for achieving targets and goals and include contingency plans in the event that targets are not met. To provide some of the information needed to develop this Plan, projections were made for the twenty year period FY2005 through FY2024 to help predict the amount of: (1) Connecticut MSW, C&D waste/oversized MSW, and RRF ash residue generated, disposed, and diverted from disposal; (2) the in-state disposal capacity for those wastes; and (3) the in-state disposal capacity shortfall for those wastes. The projections developed are based on a number of factors including: solid waste data reported to the CT DEP; estimates of data not captured by the reporting system; and the development and use of a regression analysis based on Connecticut's population and gross state product. These analyses resulted in the assumption of a 1.6 percent annual increase for some components of the solid waste stream. The assumptions used in making these projections can be found in Chapter Four – Tables 4-1, 4-2, and

4-3, with a more full discussion in Appendix J. Projections were made for four broad scenarios.

MSW Projections Scenarios

Connecticut's *MSW in-state disposal capacity* is determined by the in-state landfill capacity and the in-state RRF capacity. The *MSW in-state disposal capacity shortfall* is the MSW disposed subtracted from the in-state disposal capacity.

Scenario 1. The current MSW diversion from disposal rate, 30 percent, remains the same and would result in increasing annual in-state disposal capacity shortfalls reaching 1.5 million tons by FY2024.

Scenario 2. The current MSW diversion rate increases to 40 percent (goal prescribed by state statute) by FY2015 and remains at 40 percent through FY2024. A 40 percent MSW disposal diversion rate would still result in increasing annual in-state disposal capacity shortfall for MSW of 931,000 tons by FY2024.

Scenario 3. The current MSW diversion rate increases to 49 percent by FY2024 thereby maintaining a consistent tonnage of MSW requiring disposal from FY2005 through FY2024. A 49 percent MSW disposal diversion rate would only slightly increase the current annual in-state disposal capacity shortfall and would be 471,000 tons by FY2024.

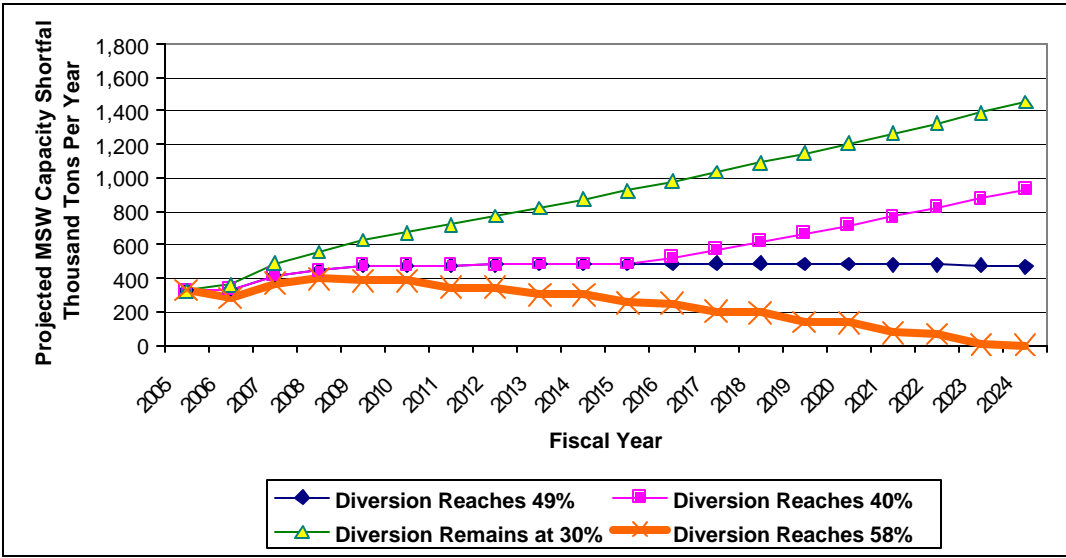
Scenario 4. The Plan's target of a 58 percent MSW disposal diversion rate is achieved by FY2024 and the projected in-state disposal capacity shortfall is eliminated by FY2024.

Unless Connecticut can successfully divert more waste from disposal, the in-state disposal capacity shortfall for MSW will grow as depicted in ES Figure 2 which shows the projections of in-state MSW disposal capacity shortfall under the four scenarios described above.

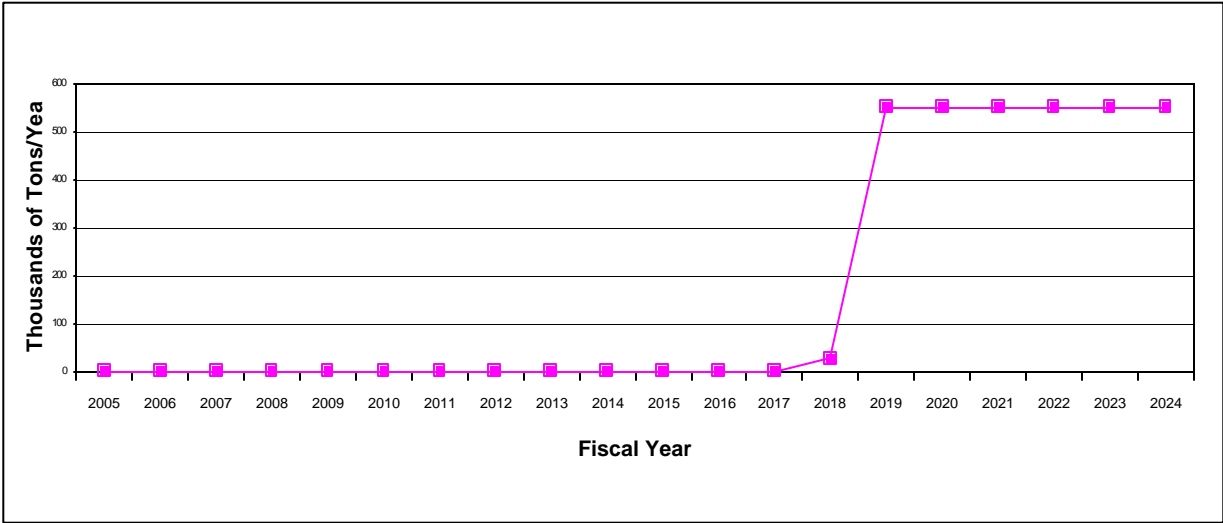
MSW RRF Ash Residue Projection Scenarios

Based on a number of assumptions as detailed in the Plan, it is projected that in-state disposal capacity for MSW RRF ash residue will be sufficient to meet the needs of all the state's RRF ash residue generated through the end of FY2018. Projections of generation of Connecticut MSW RRF ash residue requiring disposal and in-state disposal capacity were made based on the following: no new MSW RRF capacity will be built in-state during the planning period; the amount of MSW processed at Connecticut RRFs remains constant; and the amount of RRF ash residue requiring disposal remains constant. Figure 3 shows the projections of in-state MSW RRF ash residue disposal capacity shortfall for the period FY2005 through FY2024.

ES - Figure 2
Projections of In-State MSW Disposal Capacity Shortfall Under Various Waste Diversion Assumptions for the Period FY2005 through FY2024.



ES - Figure 3
Projections of In-State MSW RRF Ash Residue Disposal Capacity Shortfall for the Period FY2005 through FY2024



C&D waste/oversized MSW Projection Scenarios

Based on the available data regarding the generation of C&D waste/oversized MSW, it is difficult to set a specific goal for reducing the amount of this type of waste requiring disposal. Nonetheless, an effort will be made to maximize the diversion of this waste from disposal. The projections for the amount of C&D waste generated was based on reported data and assumed a 1.6 percent annual increase in the amount of such waste generated. Listed below are three scenarios.

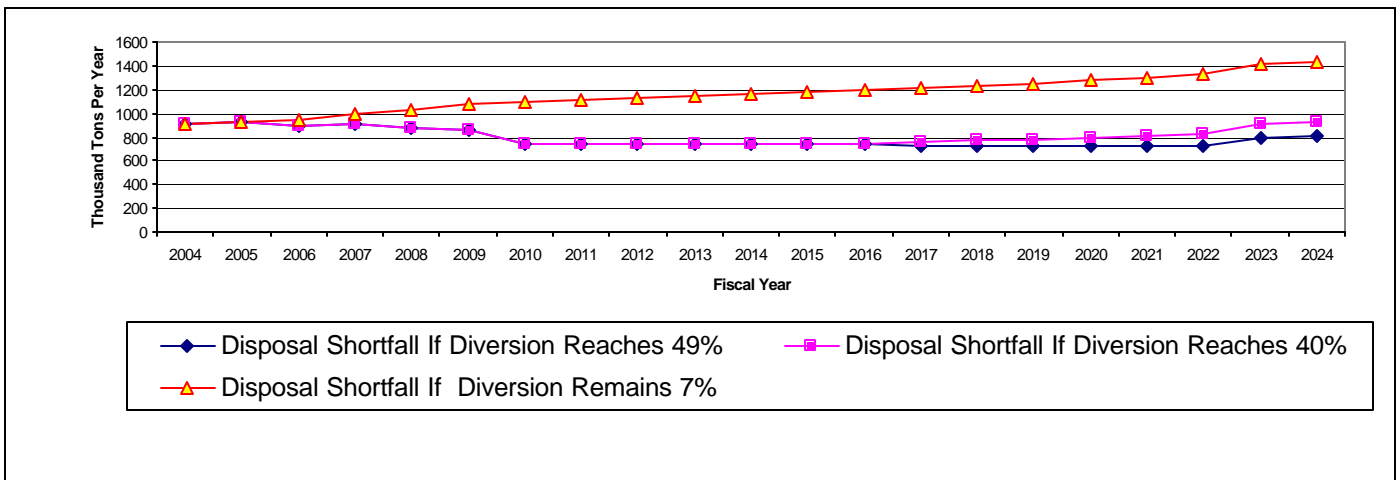
Scenario 1. The current diversion from disposal rate, seven percent, for C&D waste/oversized MSW remains the same through FY2024. This would result in increasing annual in-state disposal capacity shortfalls through FY2024 for C&D waste/oversized MSW and would be 1.4 million tons by FY2024.

Scenario 2. The current C&D waste/oversized MSW disposal diversion rates increases to 40 percent by FY2015 and remains at 40 percent through FY2024. A 40 percent disposal diversion rate by FY2024 is projected to slightly decrease and then increase the level of C&D waste/oversized MSW annual disposal capacity shortfall so that by FY2024 the disposal capacity shortfall would be similar to current levels.

Scenario 3. The current C&D waste/oversized MSW diversion rate increases to 48 percent by FY2024 and would result in a slight decrease in the annual in-state disposal capacity shortfall for this waste by FY2024.

Unless Connecticut can successfully divert more waste from disposal, the in-state disposal capacity shortfall for C&D waste/oversized MSW will grow as depicted in ES Figure 4 which shows the projection for in-state C&D waste/oversized MSW disposal capacity shortfall.

ES Figure 4.
Projections of In-State C&D Waste/Oversized MSW Disposal Capacity Shortfall Under Various Waste Diversion Assumptions for the Period FY2005 through FY2024.



Key Factors Affecting Solid Waste Management in Connecticut

The context for solid waste management in Connecticut has changed substantially since the last statewide solid waste management plan was adopted in 1991. The following are among the key issues that will shape solid waste management in coming years:

- If Connecticut doesn't substantially increase the rate of MSW disposal diversion, it is projected to have an increasing shortfall of MSW in-state disposal capacity.
- Currently there is increasing out-of-state capacity for solid waste disposal at competitive prices.
- Solid waste is a commodity subject to interstate commerce laws.
- Bonds that financed the construction of the MSW RRFs will be paid off, and municipal contracts to supply MSW to Connecticut's RRF facilities will expire over the next two to fourteen years. Over this same time period, disposal capacity at four of the six MSW RRFs may shift from public to private ownership.
- Recycling and solid waste management services are increasingly privately run and market-driven.
- Connecticut's waste diversion infrastructure is stagnant and State and municipal funding is inadequate to support and achieve increased source reduction, reuse, recycling, and composting.
- Nationally, recycling of non-traditional material streams has grown significantly.
- National and global recycling markets have grown substantially.
- Other states and communities have demonstrated an ability to achieve higher waste diversion rates than Connecticut has achieved to date.
- There is a growing interest in product stewardship and producer responsibility policies.

Major Recommendations

MSW Disposal Diversion Rate

The Plan has established a target of 58 percent MSW disposal diversion by FY2024. To help identify and assess the strategies needed to meet this target rate, the Department will conduct a waste characterization study; continue to monitor the State's disposal diversion rates and conduct a comprehensive analysis of that rate at the mid-point of this planning period, i.e. by FY2016, for the purpose of determining the success to date and future expectations in achieving the desired results; and encourage and promote research, consider and evaluate new technologies, and assess and eliminate institutional barriers in order to establish such activities in-state.

Source Reduction, Recycling, Composting

The recommendations regarding source reduction, recycling, and composting represent the centerpiece of this Plan. After rapid growth in the early to mid 1990s, Connecticut's recycling efforts have become stagnant and are in need of reinvigoration. This Plan sets forth objectives and strategies to be implemented so as to reduce our per capita disposal rate from 0.8 tons/person/year in FY2005 to 0.6 tons/person/year in FY2024. This is to be accomplished by adopting a fifty-eight percent MSW disposal diversion rate by FY2024. This rate is consistent with the Connecticut Climate Change Action Plan 2005 recommendation that called for an increase in recycling and source reduction of municipal solid waste to achieve significant greenhouse gas reductions. While much of the burden of accomplishing this will fall on the Department, a greater amount will necessarily be borne by municipalities and businesses. Significant increases in funding will be needed to support these efforts.

The State needs to take advantage of increasing demand for recycled material, especially in overseas markets, by increasing the amount of marketable material recovered for recycling. The State must also facilitate the development of a more robust recycling business infrastructure in Connecticut for almost all materials including paper, metals, electronics, and compostable organics. In particular, significant results can be achieved through increased efforts to compost source separated commercial and institutional food wastes, as is being done in other states. In order to reduce the amount and toxicity of waste being generated, Connecticut must focus more effort on packaging. The State will continue to work with the Toxics in Packaging Clearinghouse to enforce existing laws and to encourage producers to reduce the amount and toxicity of packaging being used.

Disposal Capacity

There is not enough disposal capacity in-state to handle all the Connecticut solid waste requiring disposal. This is true for the major components of the solid waste stream: MSW and C&D waste. The adopted 1991 State Solid Waste Management Plan and the proposed 1999 Plan were based on the premise that the state should have sufficient in-state capacity for recycling, processing and disposal to manage all Connecticut MSW and ash residue generated by Connecticut resources recovery facilities. This Plan continues to recognize that self-sufficiency in managing our solid waste represents good public policy for Connecticut for many reasons, including the ability to better control costs and other risks related to solid waste disposal. This Plan emphasizes that a significant reduction in the amount of waste disposed must be achieved as the primary means of attaining self-sufficiency.

Public or Private Ownership and Control

Another key issue is whether the RRF capacity in Connecticut and the RRF ash residue landfill capacity in Connecticut will be owned and controlled by public or private entities. Bonds that financed the construction of the RRFs will be paid off

over the next two to fourteen years and contracts for disposal at the RRFs will expire over that same time. Further, the Hartford landfill, where CRRA sends the ash generated at the Hartford RRF, will be closing in two years, leaving one (privately owned) RRF ash residue landfill in Connecticut. These events will lead to a major shift in control of the majority of the MSW and RRF ash residue disposal capacity in the state from public to private entities. Private owners will be free to enter into contracts with out-of-state generators for some of the existing capacity that today is contracted to and/or used by Connecticut's municipalities. While this Plan does not advocate for or against private ownership, it does urge the state's decision-makers to take note of the issue, fully debate it, and make the prudent decisions necessary to ensure that the interests of Connecticut's citizens and businesses are protected.

Planning, Evaluation, and Measurement

This Plan replaces the last Plan adopted by the Department fifteen years ago in 1991. That is clearly too much time between plan revisions. Therefore, one of the recommendations of this Plan is that the Department regularly identify the critical solid waste issues facing the state and make appropriate revisions to this Plan. In order to ensure that these efforts are comprehensive and reflect diverse views, the Department will form a standing Solid Waste Management Advisory Committee, with representation from the public and private sectors. Finally, rather than expecting 169 towns to prepare their own solid waste management plans as envisioned by existing law, the Department should ensure that its planning efforts thoroughly evaluate and reflect municipal accomplishments, needs, and trends. Collecting data is critical to perform these evaluations. To facilitate this, changes must be made to existing municipal reporting requirements so they are less burdensome and more meaningful.

Permitting and Enforcement

During the public process, many urged the Department to streamline its permitting processes, especially for those activities that support the goals of this Plan, such as increased recycling and composting. The Department agrees with these suggestions, and this Plan makes several recommendations for improving the permitting process. Some of the most significant recommendations are as follows:

- make review of the applications for recycling, composting, and other beneficial facilities a high priority for the permit program;
- develop fact sheets, model permits, and other helpful materials for prospective permit applicants;
- form a review team whose primary responsibility will be to review applications for beneficial activities;
- require permitting or some other regulation of waste haulers, consistent with the Governor's Task Force Report recommendations that are carried forward; and
- evaluate opportunities to reduce permitting requirements for the beneficial reuse of certain waste materials.

It is recognized that the Department must make enforcement of solid waste laws a high priority, and the Plan includes recommendations for accomplishing this task. In addition, recognizing that most of the potential for improvement in recycling rates exists in the municipalities, recommendations are made to increase the level of enforcement at the local level, using existing authorities. The Department will work with municipalities to identify barriers to accomplishing this and will partner with municipalities to take appropriate enforcement actions.

Funding

This Plan charts an aggressive course for meeting the challenges of managing Connecticut's solid waste over the twenty year planning period. Action is recommended through the implementation of seventy-five strategies over the next several years to deal with these difficult issues. As with many other important programs, addressing these needs will require significant support in the form of funding at the local, state, and regional level.

One of the most difficult, but clear, challenges that face decision-makers and the citizens of Connecticut is to find the resources for these programs when other critical needs are competing for the same limited public dollars. As the public, legislators, and other officials make decisions on which strategies will be implemented, appropriate sources of funding must be identified. The following are the specific potential funding sources identified in this Plan:

- capture some or all of the unclaimed bottle and can deposits (escheats);
- expand the Solid Waste Assessment to all disposed solid waste, including all MSW, C&D debris, and oversized MSW, whether disposed in-state or out-of-state;
- increase the Solid Waste Assessment beyond the present \$1.50 per ton;
- direct enforcement penalties to a special account for distribution to municipalities and regional authorities aimed at recycling; and
- bond funds for infrastructure to support demonstration projects and/or development of publicly controlled recycling facilities.

Without adequate funding, many of the critical needs identified in this Plan will not be met. It is up to all citizens of Connecticut to fully debate these issues and make the decisions necessary to properly manage the solid waste that we generate.

Statutory and Regulatory Changes Needed

Many of the changes needed to meet the goals of this Plan cannot be implemented without action by the legislature to change Connecticut's solid waste statutes, and possibly other areas of the law such as those affecting taxes and revenue. The following are some of the more significant recommendations identified in this Plan that will require statutory and/or regulatory change:

- establish a recycling program for electronics;

- increase funding sources, and increase the authority to pass adequate funding along to municipalities and regional entities;
- prohibit the disposal of unprocessed construction and demolition waste;
- add plastics #1 and #2 and magazines to the list of mandated recyclables;
- create incentives to encourage businesses to create or expand activities that will move the state forward in meeting its waste diversion goals;
- amend the permit program;
- expand the bottle bill to include plastic water bottles, and increase the deposit to ten cents;
- require liners for all new C&D/oversized MSW/bulky waste landfills; and
- comprehensively align and update solid waste management laws.

Critical Issues for Decision Makers

The issues raised in this Plan present significant challenges to Connecticut's citizens, businesses, and government leaders. Many critical decisions must be made over the next several years in order to successfully meet those challenges. The most critical issues or decisions, and those who will need to help address them, are outlined below:

State Legislators

- Find ways to help fund the actions outlined in this Plan, and support those needing additional resources including state agencies, regional authorities, and municipalities.
- Evaluate the role of CRRA given the changing conditions in the state with regards to the MSW RRFs and the changing and complex nature of managing the solid waste stream.
- Expand authority allowing state agencies, regional authorities, and municipalities to more effectively manage and regulate solid wastes.
- Help define what role government entities should play in directly managing and/or controlling the solid waste management infrastructure.
- Expand recycling mandates.
- Establish incentives to encourage expansion and creation of new recycling and composting infrastructure.
- Continue to support environmentally preferable purchasing by state government, including Connecticut's state colleges and universities.

Department of Environmental Protection

- Serve as a model for other governmental entities, businesses, and citizens to enhance source reduction, composting, recycling, and buying environmentally preferable products.
- Maximize resources to support and maintain solid waste education, assistance, recycling, permitting, and enforcement.
- Establish a standing Solid Waste Management Advisory Committee.
- Establish permitting of beneficial activities as a high priority for the Agency.
- Continually monitor solid waste issues nationally, regionally, and locally and help guide Connecticut to manage its solid waste in response to those issues in a manner that best protects the environment and human health.

Other State Agencies

- Provide support to research, develop, and market recycling processes and products.
- Adopt purchasing practices that create less waste and buy environmentally preferable products.
- Increase source reduction and recycling efforts in agency operations.

Local Officials and Regional Waste Authorities

- Continue to play an active role in the proper and efficient management of solid waste in their communities.
- Expand recycling/source reduction programs and efforts.
- Increase enforcement of local recycling ordinances.
- Enact or amend ordinances to reflect new State programs.
- Change purchasing practices to create less waste and purchase environmentally preferable products.

Businesses

- Provide cost effective and efficient solid waste management opportunities.
- Increase efforts to recycle and source reduce the solid waste generated.
- Establish new businesses to expand recycling and composting infrastructure.
- Change purchasing practices to create less waste and buy environmentally preferable products.
- Adopt a product stewardship ethic.

Citizens

- Change practices to create less waste.
- Purchase environmentally preferable products.
- Increase recycling efforts.
- Compost food waste and other organics.

Summary

The efforts made over the next five to ten years will largely determine the success or failure of the State in meeting the challenges set out in this Plan. Connecticut's existing approach to solid waste management has served its citizens well. However, the solid waste field has continued to evolve to the point where new approaches and greater effort will be needed to meet the challenges. Future discussions and actions will determine the State's success in significantly reducing our per capita disposal rate, reliance on Resource Recovery Facilities, the potential need for new disposal facilities, the role of landfills, and how much Connecticut will pay for these programs. Most importantly, they will determine whether or not Connecticut's citizens and businesses will make a greater commitment to source reduction, recycling, and composting. This Plan is only a starting point. The on-going, hard work of a diverse set of stakeholders will be needed for Connecticut to achieve its Solid Waste Management Vision.

Chapter 1

INTRODUCTION

1.1 Purpose of the Plan

The mission of the Department of Environmental Protection (the Department or CT DEP) is to conserve, improve, and protect the natural resources and environment of the State of Connecticut. This is to be done in a way that encourages the social and economic development of Connecticut while preserving the natural environment and the life forms it supports in a delicate, interrelated and complex balance, so that the State may fulfill its responsibility as trustee of the environment for present and future generations.

As part of this responsibility, the Department has adopted this State Solid Waste Management Plan, dated December 2006 (the Plan). The Plan addresses the management of solid waste (not including non-residential hazardous waste) generated in Connecticut for the period fiscal year (FY) 2005 through FY2024. The Department will use this Plan as a basis for directing its solid waste programs, and other interrelated programs affecting the management of solid waste; for guiding changes in state policy, legislation and programs; for promoting and assisting public and private activities; and for evaluating permit applications.

1.2 Statutory and Regulatory Authority for this Plan

Section 22a-228 of the Connecticut General Statutes (CGS) requires that the Department adopt a state-wide solid waste management plan which establishes specific goals for source reduction, bulky waste recycling, and composting; adheres to the statutory solid waste management hierarchy; assesses landfill capacity needed in the state for residue from resources recovery facilities and for bulky waste; and outlines specific strategies for source reduction. This Plan represents an amendment of the *State of Connecticut Adopted State Solid Waste Management Plan, dated February 1991* and has been adopted in accordance with procedures prescribed in Section 22a-228-1 of the Regulations of Connecticut State Agencies (RCSA) for amending and adopting a state-wide solid waste management plan. This Plan supersedes the 1991 Plan.

1.3 The Adoption Process

Working with both Internal and External Stakeholder Committees and supported by the services of R. W. Beck, Inc., the Department completed the development of a draft Proposed Amendment to the State Solid Waste Management Plan in late 2005 for initial public comment. The Department released a Proposed Plan in July 2006 and held regional public meetings and public hearings in the summer of 2006. In

November 2006, a Hearing Officer's Report was prepared and submitted to the Commissioner of the CT DEP on the hearings and testimony submitted on the Proposed Plan for her consideration and approval. Based on the Commissioner's approval, the Plan was revised accordingly and adopted by the Commissioner in December 2006.

An External Stakeholders Committee was established to assist in this process. It consisted of representatives from municipalities, regional solid waste authorities, non-governmental organizations, solid waste management companies, environmental and community organizations, and major waste generating industries. An Internal Committee was established and consisted of representatives from the Bureaus of Air, Waste, and Water and the Office of the Commissioner (Office of Planning and Program Development, Communications, Environmental Justice, and Long Island Sound Programs). The members of the External Stakeholders Committee provided their individual and collective expertise and perspectives, but they were not asked to endorse this Plan. All meetings of the External Stakeholders Committee were open to members of the public, who were also afforded the opportunity to make comments. External Stakeholders Committee meeting notes and announcements of meetings, public notice of other meetings, the draft Plan, and other relevant Plan information were posted and updated regularly on the CT DEP website. Appendix C summarizes the public input process in greater detail.

1.4 Solid Waste Management Plan Consistency Requirements

CGS Section 22a-229 requires that *...after the adoption of a statewide solid waste management plan pursuant to section 22a-228, any action taken by a person, municipality, or regional authority that is governed by this chapter (Chapter 446d, Solid Waste Management) shall be consistent with such plan.* The Department therefore reviews all solid waste permit applications for consistency with the Plan.

1.5 Solid Waste Planning Framework

1.5.1 Twenty Year Planning Horizon

This Plan addresses solid waste management in Connecticut for the period FY2005 through FY2024. Projections concerning disposal needs are provided for the twenty-year planning period. These long-term projections are useful in showing the predicted trend of waste generation and management needs for the future and will be refined through future planning efforts. However, the Department will prioritize activities focused on the goals of this Plan that will be carried out over a shorter term, the next four to five years. The ability of the State to meet the aggressive goals of this Plan will largely be determined by the success or failure of the efforts made over that period.

1.5.2 Solid Waste Management Hierarchy

The overall goal of this Plan is to safely and effectively meet the solid waste management needs of Connecticut by reducing the amount of waste generated and disposed of, thereby minimizing the impacts of waste management and product manufacture on the environment. This goal will be attained by managing solid waste according to the following hierarchy of preferred management methods established by CGS Section 22a-228(b):

- 1) source reduction;
- 2) recycling;
- 3) composting of yard waste or vegetable matter;
- 4) bulky waste recycling;
- 5) resources recovery facilities (RRF) or waste-to-energy plants; and
- 6) incineration and landfilling.

First, the generation of solid waste should be avoided to the greatest extent possible through source reduction. Source reduction prevents the creation of waste that would otherwise have been generated. Waste that cannot be eliminated by source reduction should be recycled, and organic materials should be recycled or composted. Finally, the remaining waste that cannot be feasibly or safely reduced, recycled, or composted, should be directed to RRFs for disposal and recovery of energy value or to other waste-to-energy plants for energy recovery. Landfill disposal should be reserved for only those wastes that are not suitable for source reduction, recycling, composting, or RRF or other waste-to-energy plants. Municipal solid waste (MSW) incineration without energy recovery no longer exists in Connecticut.

1.5.3 Provision of In-State Capacity for Connecticut's Solid Waste

The *Determination of Need* provision in CGS Section 22a-208d requires the Department to determine that: (1) a need exists in the state for additional waste processing or disposal capacity before granting a construction or expansion permit for a resources recovery facility, mixed MSW composting facility, mixed MSW disposal area, or resource recovery facility ash residue disposal area; and that (2) such a facility will not result in substantial excess disposal capacity in Connecticut. It should be noted that the statute makes reference to mixed MSW composting. However, to date, the Department does not view this process as an acceptable method for managing MSW. In 1996, the General Assembly amended CGS Section 22a-228(b) to eliminate composting of mixed MSW from the solid waste management hierarchy.

Since the adoption of the 1991 State Solid Waste Management Plan, much has changed. During the late 1980s through the 1990s, Connecticut implemented the strategies of the 1991 Plan and developed a strong infrastructure for recycling and disposal (RRFs and RRF ash residue landfills). However, growth in our infrastructure to deal with waste diversion has waned. There has also been change with respect to

how MSW is managed in-state, regionally, and on a national level. The 1991 Plan dealt solely with the solid waste needs of Connecticut and planned for sufficient in-state MSW disposal capacity for Connecticut generated MSW. Until fairly recently, Connecticut facilities have been able to provide capacity for all Connecticut generated MSW which needed to be disposed. However, there has been a trend nationally for greater amounts of solid waste to flow across state borders. There has also been a trend for Connecticut to export more of its MSW, construction and demolition (C&D) waste, and oversized MSW to out-of-state disposal facilities.

Many stakeholders have argued in support of self-sufficiency for waste disposal. That is, there should be adequate disposal capacity in the state for waste generated in the state that needs disposal. It is recognized that this position represents good public policy for Connecticut for many reasons. In particular, the state can better control costs and other risks related to solid waste disposal. This Plan encourages such a policy of self-sufficiency, and the CT DEP will use its authority as much as possible to adhere to this approach.

While it is good public policy to manage the majority of Connecticut's waste within its own borders, we do not control all the market forces that influence the development and location of new waste management facilities. Therefore, absent a mandate to create additional state-sponsored waste management infrastructure, the Department must continue to monitor the disposal capacity situation and advise decision makers of any significant changes to the overall solid waste management system that create greater uncertainty or increased risk.

To move Connecticut toward self-sufficiency, this Plan calls for achieving a 58 percent MSW disposal diversion rate by FY2024; if achieved, it is projected that by FY2024 there would be no in-state MSW disposal capacity shortfall. Although the Department needs more data and information and will need to develop greater expertise regarding emerging waste reduction and waste management technologies in order to determine how best to achieve the 58 percent disposal diversion rate, certain steps can be undertaken to start obtaining that information and start moving towards greater waste reduction. By adopting a 58 percent disposal diversion rate, the state continues its strong commitment to the environment. In support of this target, the CT DEP will conduct a waste characterization study; continue to monitor the state's disposal diversion rates and conduct a comprehensive analyses of the disposal diversion rate by FY2016; and encourage and promote research, consider and evaluate new technologies, and assess and eliminate institutional barriers in order to establish such activities in-state. The Plan reinforces this by establishing an over-arching commitment to significantly reduce the amount of Connecticut-generated solid waste requiring disposal through increased source reduction, reuse, recycling and composting as the foremost method for solid waste management in Connecticut.

However, the state is still projected to have significant in-state disposal capacity shortfalls for construction and demolition waste/oversized MSW, and, by the end of FY2018, to have exhausted the in-state disposal capacity for MSW resource recovery facility ash residue. The state must also have contingency plans should the 58 percent MSW disposal diversion not be achieved. For these reasons, the state must closely monitor disposal diversion rates, disposal rates, and in-state disposal capacity as well

as the status of out-of-state disposal options as part of an on-going planning cycle. It must also be prepared to deal with disposal capacity issues.

Small amounts of solid waste are imported into Connecticut for disposal. However, flow control rulings limit the state's control over solid waste imports and exports. Therefore, this Plan's discussion of solid waste disposal capacity deals solely with the disposal capacity needs for solid waste generated in Connecticut and makes no provision for capacity to handle MSW generated beyond the state's borders.

Some special wastes (biomedical waste, asbestos) have unique processing and disposal requirements, not all of which can be accommodated in Connecticut. Whereas, the state should strive to develop infrastructure and disposal systems to handle its special waste, this Plan acknowledges that not all of the types and quantities of Connecticut-generated special waste, can be processed and disposed of in-state for the foreseeable future. Regional solutions for managing this type of waste may be a preferred option.

1.5.4 Responsibility for Solid Waste Management in Connecticut

In Connecticut, the management of solid waste is shared by many: the CT DEP, the Connecticut Resources Recovery Authority (CRRA), municipalities, regional or municipal resources recovery authorities, regional resource recovery and recycling operating committees, and private enterprise. The Department's responsibilities, described in CGS Chapter 446d, include statewide solid waste planning, technical assistance, permitting, and enforcement. The CRRA has traditionally provided services including the development and operation of facilities such as transfer stations, recycling facilities, RRFs, and other solid waste disposal facilities (CGS Chapter 446e), and has also provided for education regarding recycling through its trash museums in Hartford and Stratford. Each municipality is required to make provisions for the safe and sanitary disposal of all solid wastes generated within its boundaries (CGS 22a-220) and to make provisions for the separation, collection, processing, and marketing of designated recyclables generated within its boundaries (CGS Section 22a-220(f)). Municipalities may create municipal or regional resource recovery authorities to plan for regional solid waste management or to develop solid waste facilities (CGS Section 7-237aa). Municipalities and regions have also developed recycling programs, and, in some cases, operate landfills and transfer stations (CGS Section 22a-220). Private entities collect waste and may own and operate recycling facilities, volume reduction facilities, transfer stations, and disposal facilities.

1.5.5 Environmental Equity

The policy of the CT DEP is that no segment of the population should bear a disproportionate share of the risks or consequences of environmental pollution. The Department is committed to being responsive to addressing these concerns. The CT DEP's Environmental Equity Policy states that the Department will enhance communication with and improve environmental education opportunities for all persons, including minority and lower income communities. Further, the CT DEP will

encourage community participation in the Department's ongoing operations and program development, including but not limited to inclusion on the Department's advisory boards and commissions and regulatory review panels, and participation in planning and permitting activities. The CT DEP will continue to pursue these efforts with respect to solid waste management and to strive to educate all populations about source reduction, recycling, composting, and appropriate handling and disposal of all solid waste and household hazardous wastes.

1.6 Variables Potentially Impacting Solid Waste Management

Detailed below are some of the factors that will likely affect Connecticut's solid waste management system over time. Although the Department has little statutory control over these factors, they could impact the strategies as identified in this Plan. It is therefore very important that the Plan be reviewed and updated regularly.

- Over the next two to fourteen years, the MSW RRF contracts will expire and the bonds that financed them will be retired. Also, transfer of control of most RRFs processing capacity from the public to the private sector may potentially occur. Capacity at the Mid-CT RRF would remain under CRRA control. A more detailed discussion of this issue is found in Chapter 5 and Appendix K.
- Mergers and acquisitions in the private waste management industry can change the economics of Connecticut's solid waste management system by impacting collection and tipping fees. Such consolidation may also encourage out-of-state disposal if there are economies of scale associated with hauling out-of-state and tipping fees are lower in other states.
- New technologies will likely expand the management options for solid waste. Such technologies could provide alternatives to disposal of certain categories of waste and might include waste to energy facilities that are less polluting such as the conversion of clean wood wastes into fuel through gasification or the beneficial use of wastes in products. The Department will support new technologies that use and manage wastes in a manner that is less harmful to human health and the environment than existing technologies currently in use.
- EPA reports, *Characterization of Municipal Solid Waste in the US: 1998 Update* and the more recently released *Municipal Solid Waste in the United States: 2005 Facts and Figures Executive Summary* and other studies indicate that there is a statistically significant positive relationship between economic activity, consumption, and waste generation. Consequently, waste generation projections for the state will likely need to be adjusted as the economy grows or contracts.
- Broad cultural changes are also likely to impact waste generation and management. For example, there has been an increase in the amount of computers and other electronic equipment in the waste stream as computer technologies have advanced. The increased use of computers and e-mail in home settings may increase the amount of high-grade office paper in the residential waste stream and

a projected increase in on-line shopping would result in higher quantities of corrugated and packaging materials in the waste stream. The Department will conduct its own waste characterization studies, as well as monitor other waste characterization and composition studies, and analyze the impact of these changes on solid waste management needs in Connecticut.

1.7 Plan Contents

After this Introduction, the Plan includes the following:

- Chapter Two summarizes Connecticut's current conditions and practices, waste projections and identifies key issues that will determine the State's future directions.
- Chapter Three presents Connecticut's long range vision to treat solid waste as a valuable resource, and includes principles and goals that will be used as a guide to the State's efforts in managing solid waste.
- Chapter Four presents an outline for action, including specific objectives and strategies for eight critical areas:
 1. source reduction;
 2. recycling and composting;
 3. management of solid waste requiring disposal;
 4. management of special wastes and other types of solid waste;
 5. education and outreach;
 6. program planning, evaluation, and measurement;
 7. permitting and enforcement; and
 8. funding.
- Chapter Five outlines implementation approaches to the Plan and begins with a discussion on roles and responsibilities by both the public and private sectors and ends with a comprehensive listing of the strategies. For each of the strategies, the following is identified: the type of action needed; the assigned priority; new costs; time frames; and lead and/or key partners for implementation (i.e. government, private sector, others).

The Appendices to this Plan were prepared to provide detailed backup information that was considered during the preparation of the Plan. These appendices include the following:

- A. Definitions and Acronyms;
- B. Data Summary, Validation, and Assessment;
- C. Stakeholder and Public Input Process;
- D. Current MSW Waste Diversion Practices;

- E. Options to Increase Waste Diversion;
- F. Solid Waste Disposal Overview;
- G. Cost Analyses of Out-of-State Disposal Options;
- H. Three Areas of Opportunity in Special Waste Management;
- I. Environmental Impact of Disposal Options
- J. Projections of Solid Waste Generation and Disposal.
- K. MSW RRF - Status of Ownership.

Additional information related to the development and adoption of the Plan, public input process and general solid waste management information is available on the CT DEP's Internet web site at www.ct.gov/dep

Chapter 2

CURRENT CONDITIONS AND PRACTICES: CONNECTICUT AT A CROSS ROADS

2.1 Overview

Connecticut enjoys a comprehensive and highly effective integrated solid waste management system, including widespread municipal solid waste recycling services, regional resources recycling facilities and, for bulky wastes, a system of volume reduction facilities and limited capacity bulky waste landfills. This system effectively met the state's needs through much of the 1990s. However, the system has not grown to keep pace with increasing waste generation, and Connecticut is now exporting growing quantities of solid waste to other states for disposal. To stem this trend, the state must substantially reinvigorate source reduction, recycling, and composting while simultaneously identifying acceptable disposal capacity, especially for bulky wastes. Environmental effects, economics, and principles of environmental justice must be taken into account when assessing various solid waste management options. Successfully increasing recycling and source reduction will yield many benefits including job creation, conservation of natural resources, reduced energy use, reduced greenhouse gas emissions, reduced air and water pollution, reduced water use, and conservation of disposal capacity. It will also require significant new investment, legislation and policy changes affecting all consumers, businesses and lead government agencies with a stake in waste management. How decision makers choose to respond will determine the future of materials management in Connecticut for many years to come.

The sections below describe Connecticut's solid waste management challenges in greater detail, providing a broad overview of solid waste generation and management practices, Connecticut's integrated solid waste management infrastructure, key factors affecting solid waste management in Connecticut, and the key issues this Plan addresses that will guide the next era of solid waste management in Connecticut.

The basis of the Plan is a series of solid waste projections prepared by the CT DEP's consultant (R. W. Beck, Inc.) and were based on assumptions about future disposal capacity, historic solid waste data (FY1992 through FY2004) reported to and compiled by the CT DEP, and estimates of additional recycling tonnage from a CRRA report by Franklin Associates released in 2000. The compiled CT DEP data included: FY2003 MSW generation and recycling data, FY2004 MSW disposal data, and FY2004 bulky waste recycling and disposal data. In addition, new information was provided to the Department during the public hearing process concerning the Proposed Plan in 2006. Additional detailed information on current practices is provided in the appendices.

2.2 Solid Waste Generation and Management Practices in Connecticut

2.2.1 Types of Solid Waste

The legal definitions, taken from both the Connecticut General Statutes (“CGS”) and the Regulations of Connecticut State Agencies (“RCSA”), of the major categories of solid waste are listed below. This Plan focuses largely on the management of two types of solid wastes: municipal solid waste and bulky wastes. Several other categories of “special” solid wastes are also addressed but in less detail.

Types of Solid Waste

Solid waste means unwanted or discarded solid, liquid, semisolid or contained gaseous material including, but not limited to, demolition debris, material burned or otherwise processed at a resources recovery facility or incinerator, material processed at a recycling facility and sludges or other residue from a water pollution abatement facility, water supply treatment plant or air pollution control facility. (CGS Section 22a-207(3))

Municipal solid waste means solid waste from residential, commercial and industrial sources, excluding solid waste consisting of significant quantities of hazardous wastes as defined in section 22a-115, land clearing debris, biomedical waste, sewage sludge and scrap metal. (CGS Section 22a-207(23))

Special waste means the following wastes, so long as they are not hazardous waste pursuant to CGS Section 22a-115 or radioactive material subject to CGS Section 22a-148: 1) water treatment, sewage treatment or industrial sludges, liquid, solids and contained gases, fly ash and casting sands or slag, contaminated dredge spoils; 2) scrap tires; 3) bulky waste as defined in this section; 4) asbestos; 5) residue; and 6) biomedical waste (RCSA Section 22a-209-1).

Bulky waste means land clearing debris and waste resulting directly from demolition activities other than clean fill. (RCSA Section 22a-209-1)

2.2.2 The Integrated Solid Waste Management Hierarchy

Like the U.S. EPA and most states, Connecticut has formally adopted the integrated waste management hierarchy as a guiding framework for solid waste management efforts. Connecticut’s system adheres to this hierarchy by emphasizing source reduction, recycling, composting, and energy recovery from solid waste, while relying on landfills as a last resort. Table 2-1 summarizes the hierarchy as stated in Connecticut statute, how it is applied in Connecticut, and the current status of each management approach.

**CURRENT CONDITIONS AND PRACTICES:
CONNECTICUT AT A CROSS ROADS**

**Table 2-1
Connecticut's Application of the Integrated Waste Management Hierarchy**

The Integrated Waste Management Hierarchy	Examples of Application in Connecticut	Status
Source Reduction	Some reuse programs. State toxicity reduction laws (toxics in packaging, mercury reduction). Limited activity related to Construction and Demolition debris(C&D) or bulky waste source reduction.	Limited effort to reduce waste generated. Difficult to measure and promote.
Recycling not including composting	Municipal and hauler-provided recycling services for mandated recyclables (plus some additional materials). Nine recycling regions (some no longer active); numerous recycling processing facilities – some associated with recycling regions. Deposit system for carbonated beverage containers and lead acid storage batteries.	It is estimated that in FY2003 about 823,000 tons of MSW was recycled, of which 624,000 tons was paper. These amounts include estimates for material not captured in CT's recycling reporting system and do not include yard waste composted (see yard waste estimates presented below). Recycling rate remains constant since 1997.
Composting of Yard Waste or Vegetable Matter	100-yard waste composting facilities statewide, including 80 municipal, 14 private (non-farm) and 6 private (on-farm) facilities. Municipal/regional promotion of on-site organics management.	About 233,000 tons of yard waste composted in FY2003, plus small quantities of food waste. About 49,000 tons organics estimated to have been home composted and/or grass-cycled in FY2003. No growth trend.
C&D/oversized MSW Recycling (not including most land clearing or other clean wood). Clean fill is not regulated as a solid waste in CT	Based on reports submitted to the CT DEP approximately seven percent of the material is recycled. There are limited examples of source reduction and reuse (through reconstruction centers) and some LEED projects have recycled or reused C&D waste. Most inert clean fill is reused. Twenty CT C&D volume-reduction facilities (VRFs) process this type of waste, most of the C&D waste processed through the VRFs is land filled out-of-state.	Data is incomplete, an estimated seven percent recycled in FY2004 (about 78,000 tons mostly scrap metal and some clean wood). Amount recycled probably stable. This does not include the clean fill component of C&D waste – most of which is probably reused. EPA estimates that clean fill represents 40-50% of building related C&D waste.

**CURRENT CONDITIONS AND PRACTICES:
CONNECTICUT AT A CROSS ROADS**

**Table 2-1
Connecticut's Application of the Integrated Waste Management Hierarchy**

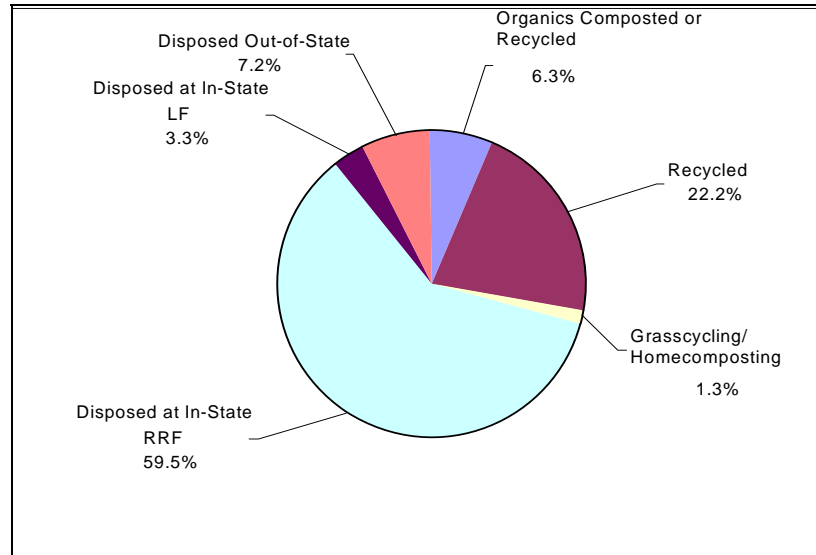
The Integrated Waste Management Hierarchy	Examples of Application in Connecticut	Status
Resources Recovery Facilities (RRF) or Waste-to-Energy Plants	6 Municipal Solid Waste (MSW) RRFs Over the five-year period FY2000 through FY2004, those RRFs burned an average of 2,209,444 tons/year. Most MSW that is not recycled or source reduced is burned at CT RRFs with energy recovery.	RRFs capacity fixed with most facilities expected to operate for another 20 years. Four have the potential of reverting from public to private ownership.
Incineration and Landfilling	Only 2 active MSW landfills remain with very limited capacity. The MSW taken by one of those landfills is mostly RRF non-processibles and processing fines. 24 active bulky waste landfills (all but 1 municipally owned).	About 121,000 tons of CT MSW land filled in CT in FY2003; about 153,000 tons in FY2004. Of the 138,767 tons of C&D/oversized MSW disposed in CT, about 130,000 tons was land filled in CT and about 8,800 tons was incinerated in RRFs CT in FY2004. About 909,000 tons bulky waste was exported for landfill in other states.

2.2.3 Management of Municipal Solid Waste

As summarized in Figure 2-1, in FY2003 approximately 3.7 million tons of MSW were generated, and the estimated statewide MSW diversion rate was about 30 percent (1.1 million tons includes estimated as well as reported amounts), having held essentially steady since 1997. Approximately 63 percent of the total CT MSW generated in FY2003 was disposed in-state (2.3 million tons). The vast majority of this disposed MSW, about 2.2 million tons, was managed in the state's six resources recovery facilities, generating electricity as a by-product. In part because of a shortfall in in-state disposal capacity, the remaining seven percent of FY2003 generated CT MSW were reported exported for disposal in other states (269,000 tons); in FY2004, that amounted to 327,000 tons reported as being exported. However, there was approximately 70,000 tons of MSW from out-of-state disposed at Connecticut RRFs and landfills. Statistics on MSW management are in some cases approximate, and all of these estimates are based on the best available data. MSW source reduction, recycling, composting and disposal are summarized in Chapter Four along with proposed strategies, and are also analyzed in depth in the appendices.

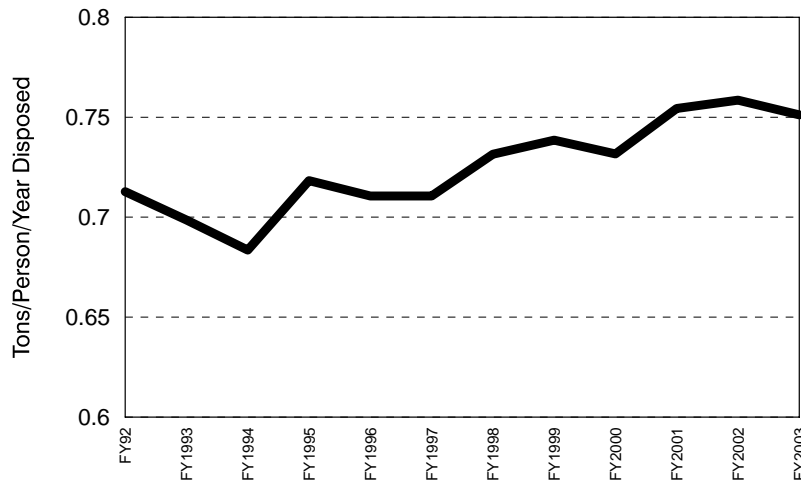
According to CT DEP data, per capita MSW disposal rates have increased from 0.71 tons/person/year in 1992 to 0.75 tons/person/year in FY2003 (see Figure 2-2). The FY2005 per capita MSW disposal rate in Connecticut was estimated at 0.80 TPY.

Figure 2-1
Municipal Solid Waste Management in FY2003 Based on Reports Submitted to CT DEP and Estimates of Additional Recycling Not Captured in those Reports
 (Total Generation = 3.7 million tons per year)



Source: FY2003 Solid Waste and Recycling Reports Submitted to CT DEP and Estimates of Additional Recycling by R.W. Beck

Figure 2-2
CT MSW Disposed – Tons/Person/Year
 FY 1992 – FY 2003



Source: CT DEP– Based on CT Solid Waste Facility Reports Submitted to the DEP and CT Department of Public Health Population Estimates

MSW Source Reduction

Source reduction, while at the top of the State’s hierarchy, is the most challenging management strategy. Because it is so difficult to quantify, CT DEP does not, for the most part, attempt to quantify waste reduced through source reduction efforts. Several municipalities encourage on-site management of organics wastes (e.g., home

composting and grass cycling), and the CT DEP estimates indicate that in FY2003 these efforts reduced the amount of MSW that needed to be managed off-site by about 49,000 tons; however, the waste was still generated. The Connecticut ban on the disposal of grass clippings and the mandate requiring leaves to be composted further encourages source reduction of these materials. In general, source reduction efforts are limited. There are eleven Connecticut municipalities that have pay-by-the-bag (pay-as-you-throw or PAYT) pricing for garbage services that provides an incentive for source reduction. As more municipalities adopt automated trash pick-up, the number of municipalities with PAYT pricing may increase as well, since service charges for larger containers are usually higher than for smaller containers. However it is unknown whether the price differentials offered for automated trash pick-up are high enough and/or flexible enough to provide residents with an incentive to reduce waste disposal. Some businesses and consumers practice source reduction activities such as utilizing waste exchanges, swaps, and consignment shops; repairing rather than disposing; double sided copying; using cloth bags; reusing products; and using reusable transport packaging. The extent to which these activities are practiced is not known. However, they are not believed to be widespread. Nationally, manufacturers have taken steps to reduce the weight of their packaging and products.

In addition to reducing waste quantity, source reduction also seeks to reduce the toxicity of the waste stream through redesign of products and packaging and changes in purchasing and other practices. In 1990, the General Assembly adopted the Toxics in Packaging Act, subsequently codified as CGS Section 22a-255g-m. This statute prohibits the intentional use of four specific heavy metals (cadmium, hexavalent chromium, lead and mercury) in packaging, including packaged products, sold or offered for promotional purposes in Connecticut. The State is a member of the Toxics in Packaging Clearing House (originally housed in the Coalition of Northeastern Governors and now housed at the Northeast Recycling Coalition, referred to as NERC) that supports and coordinates the implementation of the Model Toxics in Packaging Legislation that has been adopted in 19 states. In 1992, Connecticut became one of the first states to pass a law restricting the level of mercury in alkaline batteries (CGS Section 22a-256d). In 2002, Connecticut adopted comprehensive mercury reduction legislation that was codified as CGS Sections 22a-612 through 22a-625. The legislation establishes a program to eliminate non-essential uses of mercury in consumer, household and commercial products. The law covers a broad range of topics such as manufacturer's notification, specific product bans, sale restrictions, mercury-containing lamp management, labeling requirements, manufacturer's collection plans, and mercury products handling and disposal requirements.

MSW Recycling and Composting

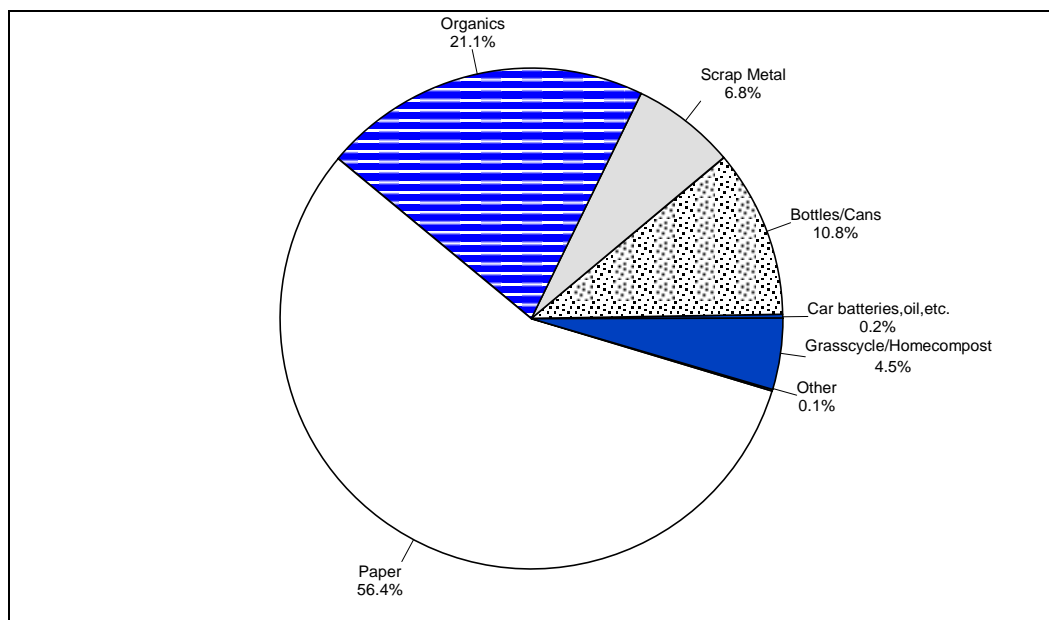
As presented in Figure 2-3, about 1.1 million tons were estimated recycled and composted (including material home composted and grasscycled) in FY2003, with paper representing about 56 percent of the material estimated recycled or composted. Connecticut State Recycling Law designated list of materials to be recycled include:

- glass and metal food containers,

CURRENT CONDITIONS AND PRACTICES: CONNECTICUT AT A CROSS ROADS

- scrap metal,
- high grade white office paper from non-residential sources,
- old newspapers,
- waste oil,
- leaves,
- lead acid storage and Ni-Cd rechargeable batteries,
- grass, and
- corrugated cardboard.

Figure 2-3
Connecticut Estimated MSW Recycling Rates in FY2003
(Total MSW Recycled Estimated at 1.1 million tons; includes estimates for non-reported MSW recyclables)



Source: CT DEP and Estimates by R.W. Beck

All generators are required to recycle these items (except high grade white office paper which is required to be recycled only by non-residential sectors). Many municipalities collect additional materials such as magazines, residential mixed paper, and plastic containers. The infrastructure for aggregating and collecting the mandated recyclables varies from town to town and can include collection by municipalities, by private haulers, or a combination of the two, and municipal drop-off options (i.e. self haul). The collected materials are either sent directly to end markets or are processed at Connecticut recycling processing facilities or composting facilities, both municipal and privately owned, which market the materials after preparing them to market specifications, or send them to other recycling facilities for further processing.

Municipal composting sites often give away the compost to residents. After rapid growth in the early to mid 1990s, Connecticut's recycling system, like those in many other states, is now stagnant and in need of reinvigoration. Advantages of Connecticut's recycling system include the fact that almost all communities have access to some level of recycling services, and either belonged, or had the potential to join or form, regional organizations to assist with marketing and processing of recyclables, though regional support has waned in recent years. Reasons for the stalled growth include a lack of funding for municipal programs, insufficient incentives for commercial recycling, reduced awareness and interest by consumers and businesses, and a lack of funding and staff support at the municipal, regional, and state levels that has stalled efforts to promote and expand programs, and enforce existing requirements.

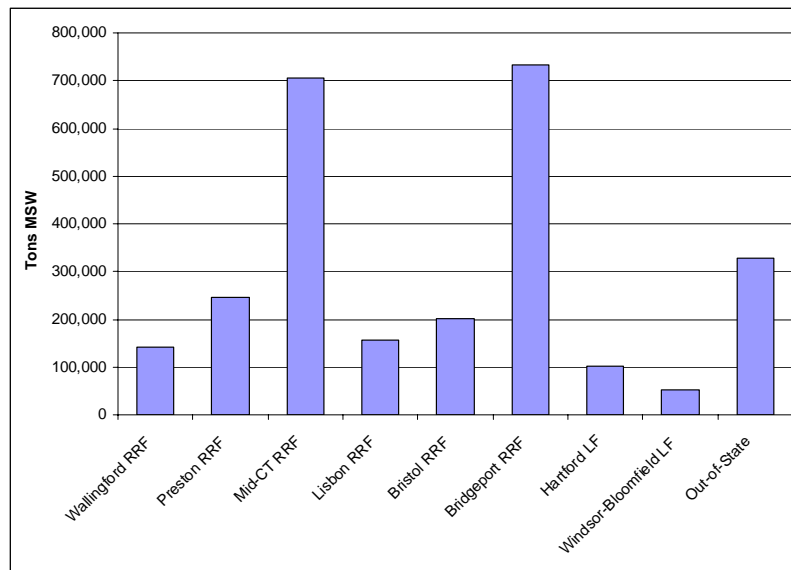
MSW Resource Recovery

The State's primary MSW disposal management approach is energy recovery through six MSW resources recovery facilities which burned an average of 2,209,444 tons/year with over the five year period FY2000 through FY2004, have a combined maximum permitted design capacity of approximately 2.6 million tons per year, and provide contracted disposal for approximately 140 out of 169 municipalities in the state. The remaining municipalities may dispose of their solid waste at these RRFs based on spot market conditions or transport their waste out-of-state for disposal. In FY2003, approximately 60 percent (2.2 million tons) of all MSW generated in Connecticut was burned in these facilities; see Figure 2-1. This is the highest percentage of resources recovery disposal capacity of any state in the nation. These facilities have at least 20 years of remaining useful life assuming normal maintenance and ongoing upgrading of environmental control technologies. Within the next ten-year timeframe, ownership and control of four of the MSW RRFs may transfer from the public to the private sector, including the Bridgeport RRF (2008); Wallingford RRF (2010); Bristol RRF (2014); and Southeast/Preston RRF (2015). Figure 2-4 shows the disposal of Connecticut-generated MSW at in-state RRFs and landfills and out-of-state disposal facilities for the period FY 2004. A more detailed discussion of this issue is found in Sections 5.2 and 5.3 and Appendix K of this Plan.

MSW Landfilling

Only about three percent (121,000 tons) of the total amount of Connecticut generated MSW was landfilled in-state in FY2003. There are only two landfills permitted to accept MSW. One is controlled by CRRA, the other is owned by a municipality. CRRA controls the Hartford Landfill under a long-term lease with the City of Hartford and uses it primarily for refuse derived fuel (RDF) process residue, as well as by-pass and other MSW not able to be processed in RRFs. Approximately 101,000 tons of MSW (83,579 tons not including the oversized MSW) was disposed at the Hartford Landfill in FY2003. The Hartford landfill was to cease accepting MSW in FY2006 but CRRA submitted a revised closure plan to the CT DEP for approval. As of December 2006, it is under technical review by the Department.

Figure 2-4
MSW Disposed in Connecticut FY 2004



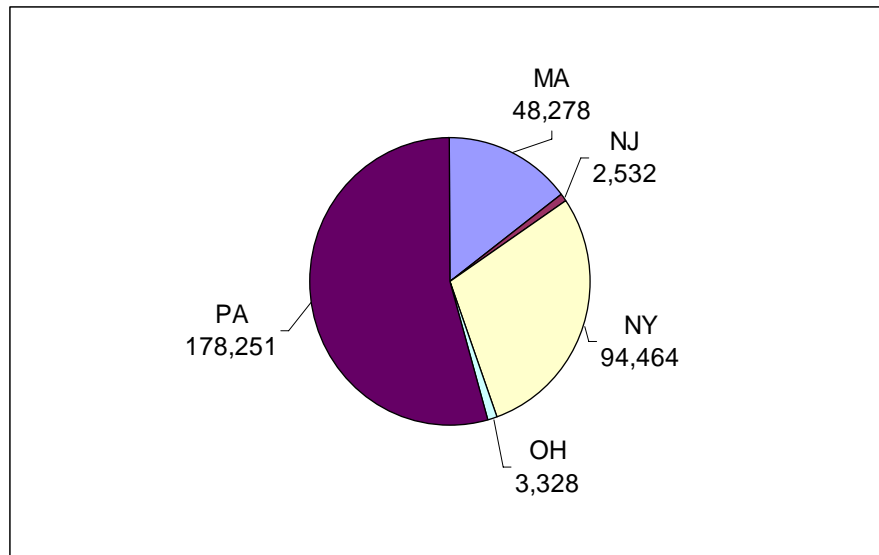
Source: CT DEP

The only other landfill permitted by the CT DEP to accept MSW is the Windsor-Bloomfield Sanitary Landfill owned by the Town of Windsor. The Department estimates that the Windsor-Bloomfield landfill had approximately 400,000 cubic yards of capacity remaining as of mid-2005, and it is scheduled to close at the end of 2007. Approximately 27,000 tons of MSW was disposed at the Windsor-Bloomfield Landfill in FY2003. In FY2004, they buried almost twice as much, or 51,000 tons of MSW.

MSW Landfilling Imports and Exports

With minimal MSW landfill capacity, an essentially fixed in-state MSW RRF capacity, and a stagnant recycling rate, out-of-state disposal facilities serve as the only option for MSW requiring disposal beyond the existing in-state MSW disposal capacity at this time. However, a significant change in ownership of disposal capacity at the CT RRFs, within the next ten years, from public to private sector control, may alter this waste flow balance. Thus, while down slightly from a peak in FY2002, the out-of-state disposal of MSW has increased tenfold from approximately 27,000 tons in FY1994 to approximately 327,000 tons in FY2004. Individual out-of-state disposal facilities and annual MSW tonnage received from Connecticut in FY2004 are summarized in Figure 2-5. Some states also send waste into Connecticut, however, the quantity has decreased over time. In FY2004, Connecticut imported about 52,000 tons of waste, mostly from Massachusetts, with small amounts from Rhode Island, New York, and New Jersey. The state was a net exporter of MSW, with approximately 275,250 net tons exported in FY2004. This amount is based on reports submitted to the CT DEP by Connecticut solid waste facilities. Out-of-state facilities are not required to report to the CT DEP.

Figure 2-5
MSW (tons) Exported for Disposal in FY2004



Source: CT DEP

2.2.4 RRF Ash Residue

The six MSW RRFs in the state generated an average of approximately 551,000 tons per year of ash residue, not including metal separated from the ash and recycled, over the five-year period FY2000-FY2004. Two landfills in the state are permitted to accept and dispose of ash residue. The ash monofill section of the Hartford Landfill currently only accepts ash residue from the Mid-Connecticut RRF (about 174,000 in FY2004) and is estimated to reach capacity and close in October 2008. The Putnam Ash Landfill accepted about 343,000 tons of ash from four Connecticut RRFs in FY2004 and, as of the end of 2004, had remaining capacity to accommodate approximately 6.7 million tons of ash residue, enough to dispose of ash from all six RRFs through FY2018 (assuming that the Bristol RRF sends its ash residue to the Putnam Ash Landfill after FY2009 when the contract with Seneca Meadows Landfill in Waterloo, NY expires).

2.2.5 Bulky Waste Management

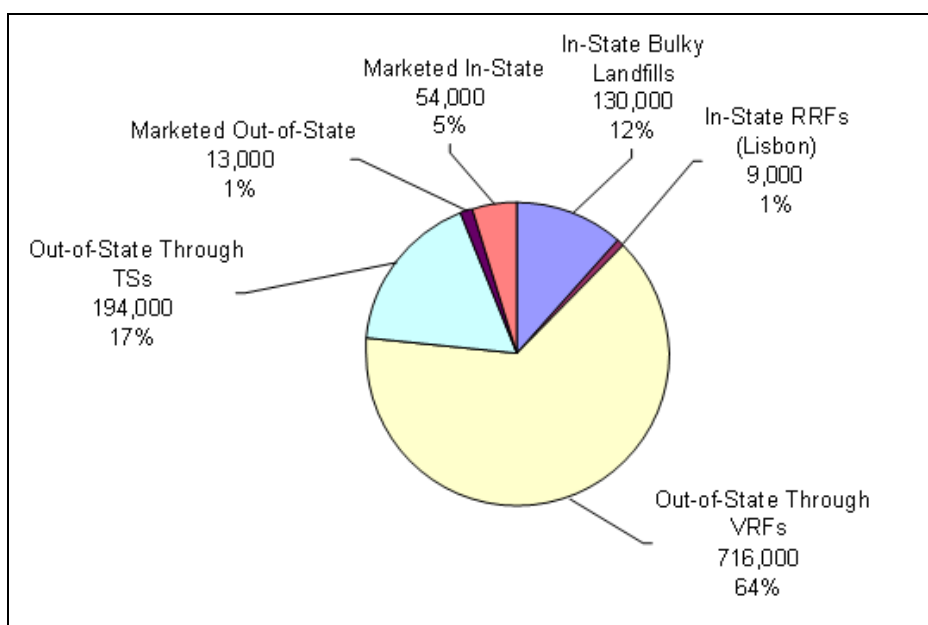
Connecticut statutes define bulky waste as demolition waste (other than clean fill) and land clearing debris. However, in practice, oversized MSW wastes such as mattresses and furniture are commonly handled along with construction and demolition wastes, and consequently in this Plan are termed “C&D waste/oversized MSW”.

As shown in Figure 2-6, about 1.1 million tons of Connecticut C&D waste/oversized MSW were reported processed, transferred through, or disposed at Connecticut solid waste facilities in FY2004. About 830,000 tons were processed by sixteen of the state’s C&D volume reduction facilities (VRFs) and over 85 percent of the C&D

CURRENT CONDITIONS AND PRACTICES: CONNECTICUT AT A CROSS ROADS

waste processed waste by those facilities was disposed in out-of-state landfills; about 194,000 tons of bulky waste (actually C&D waste/oversized MSW) were reported transferred to out-of-state disposal facilities through CT solid waste transfer stations (mostly through multi-town regional transfer stations). Single or two town municipal transfer stations also received and transferred C&D/oversized MSW; nine of those municipal transfer stations reported sending that waste to out-of-state disposal facilities. The vast majority of bulky waste taken to transfer stations is sent to landfills, although a small amount may go to VRFs for further processing and recycling. Approximately 139,000 tons (directly from generators, from Connecticut transfer stations, and from volume reduction facilities) were buried in Connecticut landfills and burned at CT RRFs; however, most of the C&D waste/oversized MSW generated in FY2004 was disposed out-of-state.

Figure 2-6
Final Disposition of CT C&D/Oversized MSW
FY 2004 (Total Generation = 1.1 million tons)



Source: Solid Waste Facility Reports submitted to CT DEP; data is rounded; data does not include the 10,000 tons of C&D metal recycled and wood reused by the CT DOT (based on FY2003 DOT report)

Bulky Waste Diversion

Recycling of C&D waste /oversized MSW is estimated to be only about seven percent, or 77,000 tons (including tons reported reused or recycled by the CT DOT). However, this does not include most of the clean fill which is part of this waste stream and which is generally reused or recycled. As of August 2005, there were approximately twenty permitted C&D volume reduction facilities (VRFs) in Connecticut. All but one of these facilities are privately owned. They have a combined permitted capacity of approximately 11,000 tons per day, or 2.7 million tons per year. VRFs sort

construction and demolition waste, process it for recycling and reduce the volume of waste to enable more cost-effective transport to landfills, primarily out-of-state. Materials recovered for reuse and recycling may include brick and block, clean fill, ferrous metal, corrugated cardboard, and clean untreated wood. VRFs also produce chipped demolition wood that may be suitable for combustion (hog fuel). Demolition activities may produce several types of materials bonded together or contaminated with hazardous materials, such as asbestos or lead paint. Some residue from VRF processing may contain a concentration of highly contaminated materials and when this is the case, the material should be disposed at lined landfills but that is not occurring in-state at the present time.

Bulky wastes, especially the construction and demolition portion, may contain significant quantities of materials that contribute to the overall toxicity. These materials include wood which may have been pressure treated, coated with lead-based paint, adhesives, pesticides or other substances defined as hazardous under CGS Section 22a-115(1). In addition, demolition activities may result in the inclusion of old appliances containing CFCs, fluorescent light fixtures containing mercury, as well as mercury found in thermostats and flame sensors, old electronics appliances, lead acid batteries, and roofing materials in the waste to be disposed. The most effective way to reduce toxicity to an appreciable extent is through separation of potentially toxic materials at the source. For demolition projects, the CT DEP encourages an assessment of whether there are materials that contain lead or other hazardous components in the structure to be demolished and disposed. To that end, in 1994 the CT DEP published the document entitled *Guidance for the Management and Disposal of Lead-Contaminated Materials Generated in the Lead Abatement, Renovation, and Demolition Industries*.

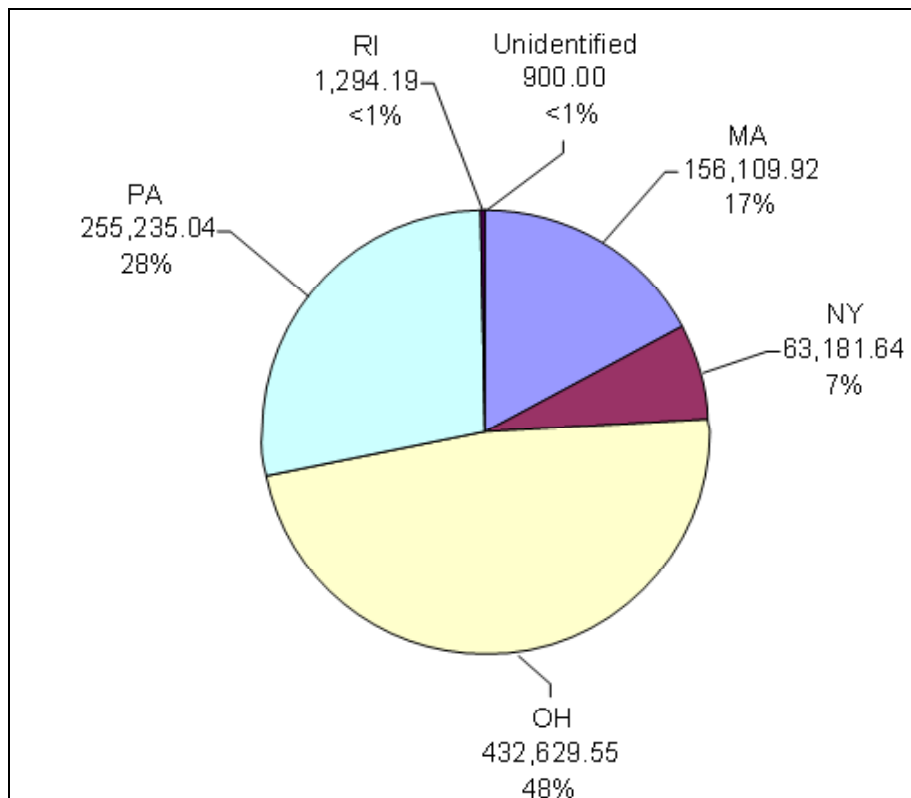
Bulky Waste Disposal

Bulky waste is generally not accepted at Connecticut's RRFs; however, some materials may be disposed in Connecticut bulky waste landfills or some RRFs. Untreated wood chips recovered from C&D waste received at a C&D VRF located in Waterford were reportedly sent to the Lisbon RRF and burned in FY2004 and FY2005 (8,800 tons in FY2004; 10,300 tons in FY2005). In addition, the MidCT RRF reported receiving and burning a small amount of wood chips; the source of this material was not reported (836 tons in FY2004; 5,295 tons in FY2005). In FY2004, about 93 percent of Connecticut C&D waste/oversized MSW was disposed in landfills and at one RRF. Of this amount, only about twelve percent was disposed in Connecticut and about 81 percent was transported to landfills in Massachusetts, Ohio, New York, Pennsylvania, and Rhode Island. There are 24 active landfills in-state that accept bulky waste and/or C&D waste/oversized MSW. These landfills are not lined. Only one of these is privately owned and operated. Most of the remaining landfills are small, municipally owned landfills serving only their communities, and are expected to close soon (with the exception of the Glastonbury landfill). The only regional landfills currently burying C&D waste/oversized MSW are the Hartford, Manchester, and Windsor-Bloomfield landfills.

Import and Export of Bulky Wastes

Transfer stations and VRFs reported sending approximately 909,000 tons of Connecticut bulky waste to 35 out-of-state landfills in five states in FY2004. As shown in Figure 2-7, bulky waste was transported to Ohio (forty-eight percent of the total), Pennsylvania (twenty-eight percent), Massachusetts (seventeen percent), New York (seven percent), and Rhode Island (less than one percent). There was very limited amount of bulky waste imported into the state and disposed at Connecticut disposal facilities (only about 400 tons in FY2004). However, there was about 7,000 tons of out-of-state bulky waste reported received at Connecticut transfer stations and subsequently transferred to out-of-state disposal facilities.

Figure 2-7
Summary of CT-Generated Bulky Waste Reported Disposed Out-of-State
FY 2004 by CT Transfer Stations and CT C&D VRFs



Source: CT DEP

2.2.6 Management of Other Types of Special Wastes

While this Plan focuses largely on MSW and bulky wastes, it also discusses several other types of special wastes. Some are briefly discussed below and a more full discussion can be found in Chapter Four.

Household Hazardous Waste (HHW)

HHW is generally defined as a household waste that is toxic, flammable, reactive or corrosive and includes oil-based paints, thinners, pool chemicals, pesticides, mercury fever thermometers, and gasoline that are generated by residences or small businesses in small quantities, and often collected and managed along with MSW. Connecticut's HHW program is well established. There are four permanent HHW collection facilities and special collection events are held in various locations throughout the state. Collections are held generally in the spring and fall each year but there are no collection opportunities during the cold weather months which creates a problem for residents moving or cleaning out a house during this time period. Additionally, CT DEP has held special events to collect mercury-containing devices or elemental mercury. CT DEP is in receipt of reports but has not yet performed statistical analyses on the volume of HHW removed from the MSW stream.

Dredge Materials

Dredged materials refer to material removed from both inland and marine waters. The main challenge with inland dredged materials is associated with the removal of dams on rivers and the management of the often-contaminated sediment from water-bodies behind the dams. This material must be managed in a similar way to contaminated soils. The potential volume of marine dredged materials is much more significant than the volume of inland waters dredged materials. Marine dredged materials result from dredging operations to deepen harbors and navigation channels and anchorages. In June 2005, EPA issued a final rule that concerns ocean disposal and the designation of dredged material disposal at sites known as Central and Western Long Island Sound Disposal Areas. This final rule requires that a regional dredged material management plan (DMMP) for Long Island Sound, which includes a comprehensive study of disposal alternatives, must be prepared by June 2013. This final rule applies to all federal projects and/or projects greater than 25,000 cubic yards. According to the CT DEP, approximately 1.125 million tons of dredge material is generated in Connecticut each year from dredging operations in Long Island Sound. Currently, there is not a treatment facility in Connecticut designed to treat dredged materials with the goal of reusing the material.

Street Sweepings

In 2005, the CT DEP produced a guidance document on the management, reuse, and disposal of street sweepings and catch basin clean-outs. Street sweepings disposal options include disposal in a MSW solid waste disposal facility, typically a landfill. However, since current landfill space is quite limited, this is not a realistic option. Since street sweepings are often collected well after the threat of freezing temperatures, their physical properties are typically altered enough that they are no longer useful for road applications. Currently, the most prevalent scenario is that the street sweepings are stockpiled, creating a management problem for the municipalities. Statistics on the quantity of street sweepings generated and how they are managed are not available.

Catch Basing Cleanings

Catch basin cleanings are usually wetter, have a higher organic content, and generally have higher levels of pollutants than street sweepings. Catch basin cleanings are also more likely to have been affected by spills and polluted runoff than street sweepings. The catch basin cleanings (solids) may be dried and disposed in a sanitary landfill or used as landfill cover. As in the case of street sweepings, there is very limited in-state opportunity for their use as landfill cover. They are often stockpiled, sometimes with street sweepings, adding to the management difficulties with street sweepings. Statistics on catch basin cleanings are not available.

Sewage Sludge

Sewage sludge is generated by the 111 wastewater treatment plants located in Connecticut. Most sewage sludge is de-watered on-site resulting in a generation of approximately 118,000 dry tons de-watered cake per year. Sewage sludge is handled by incineration, composted on-site, or is shipped out-of-state for disposal. At this time, state regulations do not allow for beneficial reuse of this type of ash residue.

Contaminated Soils

Contaminated soils are typically generated as a result of fuel and chemical spills, leaking oil tanks, and industrial accidents. Contaminants may include any substance that has the potential to pollute air or water. Owners of property containing contaminated soils generally retain a private contractor to clean up the site. Soil contamination varies in degree and is typically handled through one or more of the following options available to responsible parties in Connecticut for managing contaminated soils: deliver it to an out-of-state facility; dispose of it at an in-state landfill; deliver it to an in-state treatment facility; or reuse it in accordance with the state's Remediation Standard Regulations.

Animal Mortalities

Animal mortalities are typically managed by CT DOT or municipal road crews and are generally managed by dragging the animal off the road and burying it. In some states, animal mortalities are routinely composted with other organics. This does not appear to be a common practice in Connecticut. Large-scale animal mortalities from illness are often managed through RRFs. The animals are euthanized and disposed as special wastes for a higher tipping fee at a resources recovery facility.

Land Clearing Debris

Currently, in Connecticut, land clearing debris is managed as follows: (1) chipped or ground and then used for mulch or as a component in compost by municipalities and private recycling facilities; (2) milled for lumber or processed into firewood, though generally land clearing debris is unsuitable for either product; (3) left on site to decay; (4) illegally buried on site; (5) burned legally on-site pursuant to CGS Section 22a-174(f) or RCSA 22a-174-17; (6) dumped illegally on remote sites; (7) chipped and

sent out-of-state for use in boiler-fuel applications; (8) buried in in-state bulky waste landfills; and (9) burned at in-state RRFs. Very little land clearing debris is currently handled via the last three methods.

2.3 Waste Projections

Over the next twenty years, a variety of factors will influence the amount of Connecticut solid waste generated and disposed. These factors include population growth, Connecticut's per capita waste generation rate, the economy, and the success, or lack thereof, of waste diversion programs. In updating Connecticut's Solid Waste Management Plan, a set of assumptions was used to develop several scenarios of how waste would be managed for the next 20 years. The scenarios have been developed for MSW, ash residue from MSW RRFs, and C&D waste/oversized MSW. These assumptions and scenarios are described below, along with the resulting projections.

2.3.1 Assumptions and Scenarios

In developing the waste projections regarding the amount of solid waste generated and the amount diverted from disposal, R. W. Beck, Inc. utilized a combination of solid waste data reported to the CT DEP, estimates of data not captured by the reporting system, and the development and use of a regression analysis based on Connecticut's population and the gross state product, resulting in assumptions of a 1.6 percent annual increase for some components of the solid waste stream. In developing projections regarding in-state disposal capacity, R.W. Beck, Inc. utilized data reflecting current Connecticut solid waste facility disposal capacity and assumptions regarding the potential operating life of those facilities. Testimony provided during the public hearing process indicated that one of the core assumptions regarding the closing of the Wallingford RRF in FY2009 was not accurate, and that the Wallingford RRF would be staying in operation after FY2009. This necessitated the Department's recalculation of projected in-state MSW disposal capacity shortfalls; see Appendix J.

In updating Connecticut's Solid Waste Management Plan, four broad scenarios were considered to address the projected MSW in-state disposal capacity shortfall.

1. The most aggressive MSW scenario considered was one in which the diversion from disposal rate would be sufficient to eliminate the projected in-state disposal capacity shortfall by FY2024. That rate would equate to achieving a 58 percent MSW diversion from disposal rate by FY2024.
2. Another, but still aggressive, scenario would ensure that the amount of MSW annually requiring disposal would remain constant from FY2005 to FY2024. This would require the development of a waste disposal diversion program that would increase the current MSW disposal diversion rate from 30 percent to 49 percent by FY2024. Connecticut's in-state disposal capacity shortfall would be 471,000 tons in FY2024.
3. A more moderate scenario would require a waste disposal diversion program that would increase the current MSW disposal diversion rate from 30 percent

to 40 percent. Connecticut's in-state disposal capacity shortfall would be 931,000 tons in FY2024.

4. The last scenario considered was one that would result in the state maintaining its current 30 percent diversion rate for MSW. Connecticut's in-state disposal capacity shortfall would be 1,454,000 tons in FY2024.

A similar level of effort was made to develop scenarios for C&D waste/oversized MSW. Scenarios were developed at forty-eight percent, forty percent, and seven percent disposal diversion rates. However, since data regarding the generation of this type of waste is incomplete and the ability to recycle this material is limited at this time, it is difficult to set a specific target goal for reducing the amount of such waste requiring disposal. However, under all scenarios, steps will be taken to maximize the amount of C&D waste/oversized MSW diverted from disposal.

2.3.2 MSW Projections

Based on: (1) the scenarios listed above, (2) the projection that Connecticut would generate 5,233,000 tons of MSW in FY2024, and (3) the assumption that no new MSW disposal will be developed in Connecticut, the following outcomes would result.

- With a 58 percent diversion rate achieved in FY2024, approximately 3,035,000 tons of MSW would be diverted from disposal, leaving 2,198,000 tons of MSW to be disposed in FY2024. Using the in-state disposal capacity projected for FY2024, this would result in a zero in-state capacity shortfall.
- With a 49 percent diversion rate achieved in FY2024, approximately 2,553,000 tons of MSW would be diverted from disposal, leaving 2,680,000 tons of MSW to be disposed. This would result in an in-state disposal capacity shortfall in FY2024 of 471,000 tons of MSW.
- If the waste diversion rate reached 40 percent by FY2024, approximately 2,093,000 tons of MSW would be diverted from disposal, leaving 3,140,000 tons of MSW to be disposed. This would result in an in-state MSW disposal capacity shortfall in FY2024 of 931,000 tons of MSW.
- If the waste diversion rate remained level at 30 percent through FY2024, approximately 1,570,000 tons of waste would be diverted from disposal, leaving 3,663,000 tons of MSW to be disposed. This would result in an in-state disposal capacity shortfall in FY2024 of 1,454,000 tons of MSW.

2.3.3 MSW RRF Ash Residue Projections

With no new in-state MSW RRF capacity being developed, and assuming full usage of existing capacity, approximately 551,000 tons/year of MSW RRF ash residue would require disposal through to FY2024. If no new ash landfills were established between now and FY2024, there would be no disposal capacity available for this ash beginning

at the end of FY2018. At that time, it would all therefore have to be disposed out-of-state.

2.3.4 C&D Projections

If Connecticut increased its C&D/oversized MSW diversion rate from the current 7 percent to an aggressive 48 percent in FY2024, the disposal capacity shortfall for this waste stream would decrease from the current 940,000 tons to 801,000 tons in FY2024.

If the C&D/oversized MSW diversion rate were capped at 40 percent, the disposal capacity shortfall would be 925,000 tons in 2024.

If the C&D/oversized MSW diversion rate remained level at 7 percent over the next 20 years, the disposal capacity shortfall would be 1,436,000 tons by 2024.

2.4 Key Factors Affecting Solid Waste Management in Connecticut

The context for solid waste management in Connecticut has changed substantially since the last statewide solid waste management plan was adopted in 1991. Among the key issues that will shape solid waste management in coming years are the following:

- **Connecticut is projected to have an increasing in-state disposal capacity shortfall for both MSW and C&D waste/oversized MSW.**

The in-state MSW disposal capacity shortfall could be eliminated entirely by FY2024 if Connecticut achieves a 58 percent diversion rate by that date. If Connecticut's C&D waste/oversized MSW disposal from diversion rate remains at its current level, the existing C&D waste/oversized MSW in-state disposal capacity shortfall is expected to increase substantially by FY2024. Connecticut needs to substantially reduce the amount of C&D/oversized MSW requiring disposal in the coming years. However, because data regarding solid waste being delivered to in-state waste facilities is reported as "mixed C&D" waste or bulky waste and is not broken down by waste streams, it is difficult to estimate the portion of each that can be potentially recovered or source reduced to reduce the amount of such waste requiring disposal.

- **Supply contracts for Connecticut's RRF facilities are beginning to expire.**

Most of the contracts requiring municipal agencies to deliver determined quantities of waste to resources recovery facilities, in exchange for certainty of disposal capacity, will be expiring over the next ten-year period. At the same time, other factors affecting Connecticut RRFs (public versus private control of disposal capacity, bonds being paid, price RRFs receive for the energy they generate, etc.) will come into play. This will affect the pricing of disposal services in the state, open up new opportunities for contractual agreements by Connecticut towns and create uncertainty for the state's six resources recovery facilities. Expiration of these contracts, and private ownership

of the RRFs, would also mean that those RRFs will have a greater ability to accept out-of-state waste. This would also further limit Connecticut's ability to enforce recycling requirements.

■ **There is increasing out-of-state capacity for solid waste disposal.**

A large amount of capacity is currently available for MSW and bulky waste disposal in other states in the mid-Atlantic and Midwest regions, as described in Appendix F. The amount is anticipated to grow in coming years, notwithstanding possible restrictions on some facilities, especially those accepting bulky wastes.

■ **Solid waste is a commodity.**

The Supreme Court has ruled that solid waste is a commodity subject to interstate commerce laws. This means that government agencies may not restrict the flow of solid waste across state borders and has further enhanced the regional market for disposal capacity. The U.S. Supreme Court has agreed to review a significant solid waste flow control case, *United Haulers Association Inc. v. Oneida-Herkimer Solid Waste Management Authority*, No. 05-1345. The outcome of this case will be of great interest to many stakeholders.

■ **Recycling and solid waste management services are increasingly privately run and market driven.**

Increasingly, solid waste management services are being privatized. Moreover, across the nation there is increasing interest in maximizing the overall cost and performance efficiencies of integrated waste management systems, and this often leads to innovative approaches to providing market-based incentives that can increase recycling and other diversion efforts. Municipalities can provide such incentives through contracting terms, ordinances, and pricing policies and municipally owned waste and recycling facilities.

■ **Connecticut's waste diversion infrastructure is stagnant and needs an influx of resources.**

In contrast to the rapid growth of the early 1990s, Connecticut's efforts to promote and maximize source reduction, recycling, and composting have declined, and the waste disposal diversion infrastructure has not grown appreciably in the last eight years. Many stakeholders agree there is a need for aggressive new efforts to kick-start new recycling, especially for C&D, food waste and electronics for which recycling rates are very low.

■ **Nationally, recycling of non-traditional material streams has grown significantly.**

Nationwide, recycling programs are increasingly targeting so-called non-traditional recyclables such as some types of C&D wastes (e.g., asphalt roofing shingles, gypsum board), food wastes, tires, industrial wastes and other special wastes. Connecticut's infrastructure has yet to move aggressively into many of these new arenas.

■ **National and global recycling markets have grown substantially.**

National and global economics are much more attractive for investment in recycling infrastructure. For many traditional recyclables such as most paper grades, aluminum, PET and HDPE plastics, high color-sorted glass and others, companies that use recycled materials as feedstock are in need of greater amounts of post consumer material. In contrast to the early 1990s, these firms are now allies of recycling enthusiasts and are searching for opportunities to reinvigorate recycling programs to increase the quantity and quality of recovered material supplies. Substantial growth in export markets, especially to China, is further increasing the demand.

- **Demonstration that effective recycling programs has resulted in high waste diversion rates in other states and communities.**

While there is no uniform method of measuring and reporting waste diversion rates, making it difficult to truly compare these rates between states, some states have demonstrated their ability to achieve high waste disposal diversion rates for particular waste streams. For example, California, Massachusetts, and Oregon are all in the high forty percent range, and some communities in California have achieved diversion rates well in excess of fifty percent, and have adopted goals of seventy percent or higher.

- **There is growing interest in product stewardship and producer responsibility policies.**

A growing number of laws in Europe, Canada and Asia require manufacturers to take a degree of financial and/or physical responsibility for achieving recycling and other waste management objectives. In the U.S., state governments, including Connecticut, are increasingly calling for shared responsibility under the framework of product stewardship agreements or laws. Examples of successful programs include industry run programs (financed and administered by industry) in Connecticut to retrieve and recycle lead acid storage batteries, rechargeable batteries, beverage containers, and telephone directories. The states of Washington and Maine have been successful in enacting legislation and programs dealing with the recycling of electronics. However, to date, these efforts in the US are limited and represent only a fraction of producer responsibility program potential.

2.5 Addressing Key Issues That Will Determine Connecticut's Future Directions

This Plan addresses the following key issues that are at the core of Connecticut's solid waste management future.

- **To what extent should Connecticut seek to increase waste diversion through source reduction, recycling and composting? How can Connecticut accomplish this?**

This Plan charts an aggressive course toward increasing Connecticut's current waste diversion levels for MSW from the current level of about 30 percent to 58 percent by FY2024. The reasons for this target are:

1. By adopting a 58% MSW disposal diversion rate, the state would eliminate the projected in-state MSW disposal capacity shortfall by the year 2024.
2. Waste diversion from disposal (through source reduction, reuse, recycling) has tremendous environmental benefits, including reduced greenhouse gas generation, reduced energy and water use; fewer emissions of air and water pollutants; and conservation of natural resources.
3. This target is in line with the state's long-term vision for a shift from waste management to resource management, as discussed in the following chapter.
4. The timing of other states and the U.S. EPA moving aggressively in these areas will allow Connecticut to coordinate with and take advantage of these efforts.

Through increased source reduction, reuse, and recycling, this Plan aims to achieve these objectives in diversion from disposal for key materials, including C&D waste and food waste, and by improving, revitalizing, and building the institutional, funding, planning and other programs needed to ensure long-term growth and continual improvement in Connecticut's waste reduction infrastructure.

■ **To what extent should Connecticut seek to establish sufficient in-state disposal capacity for all MSW and bulky waste generated in the state?**

This Plan reflects Connecticut's preference to maintain sufficient in-state disposal capacity for both MSW and C&D wastes/oversized MSW (bulky wastes). However, the Plan also acknowledges that this is probably not possible, especially for bulky wastes. Connecticut will continue to export solid waste to other states for disposal, and such exports are likely to increase for some time. The degree to which the in-state disposal capacity shortfall would continue would be affected by: the success of efforts to reduce the amount of Connecticut waste requiring disposal; economic, climactic, and other factors affecting the amount of waste generated in Connecticut; changes in in-state disposal capacity; the availability and reliability of the out-of-state disposal options; the acceptability of the environmental and economic risks associated with the use of those facilities; and the upcoming (early 2007) Supreme Court decision on solid waste flow control. At the present time, options do exist for disposal of these wastes out-of-state. While it is good public policy to manage the majority of Connecticut's wastes within its borders to better assure that waste is managed in accordance with the statutorily required hierarchy for waste management, it must be recognized that the state does not control all the market forces that influence the development and location of new waste management facilities.

■ **How can Connecticut ensure that its waste management infrastructure will grow and adapt to changing conditions over time?**

This Plan present a range of strategies to establish long-term, stable funding and to strengthen Connecticut's planning, measurement, and institutional capacity to support and promote integrated solid waste management programs at all levels. These include stronger local and state planning, improved measurement and tracking activities, and establishment of capacity for market development, technical assistance and product stewardship.

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Chapter 3

FROM WASTE MANAGEMENT TO RESOURCE MANAGEMENT: A LONG-RANGE VISION FOR CONNECTICUT

3.1 Vision Statement

Connecticut's long-range vision for solid waste management is to

- significantly transform our system into one based on resource management through shared responsibility of everyone involved in the production, use, and end-of-life management of products and materials in the state;
- shift away from a “throwaway society,” toward a system that promotes a reduction in the generation and toxicity of trash, and that treats wastes as valuable raw materials and energy resources, rather than as useless garbage or trash; and
- manage wastes through a more holistic and comprehensive approach, resulting in the conservation of natural resources and the creation of less waste and less pollution, while supplying valuable raw materials to revitalize economies.

Achieving this vision will require all of Connecticut's citizens to identify and take advantage of opportunities to significantly reduce the amount of waste generated in the state, to increase the amount of recycling and reuse, and to manage the waste that must be ultimately disposed of in an efficient and environmentally protective manner. The role of the State is to implement policies and programs that catalyze all parties to move toward this vision in a manner consistent with the guiding principles listed below. This means promoting action through information, research, education, incentives, partnership building, and financial assistance to municipalities and to regional waste management entities. It also means continuing, and refining over time, the State's environmental regulatory, permitting, and enforcement functions, as well as State purchasing policies and activities. Connecticut must foster responsibility at multiple levels (individual, corporate, government) through a variety of means. The Department will work on national and regional legislative solutions to problems associated with packaging. Product manufacturers will increasingly be expected to consider how their products and packaging will be managed at the end of their useful lives, including the need to design products that incorporate fewer toxic materials and that are reusable, recyclable, or compostable. Manufacturers, other companies in the product supply chain, retailers and their customers will also increasingly be expected to share in funding and implementing reuse and recycling programs. Individuals and organizations will increasingly be expected to make wise purchasing and waste management decisions and to pay the true cost of managing waste, including the costs of their waste generation and disposal practices. Government may, over time, reduce its role in managing some wastes, while those that produce, sell, and use products may

FROM WASTE MANAGEMENT TO RESOURCE MANAGEMENT: A LONG-RANGE VISION FOR CONNECTICUT

assume greater responsibility for managing products, and their associated by-products, at the end of their useful lives.

Failure to achieve this vision will result in the need to build more landfills or resource recovery facilities in Connecticut, or to send significantly more waste to out-of-state landfills, with uncertain costs and consequences. Connecticut's citizens, its lawmakers and its government have many decisions to make to address these issues.

Some necessary changes are already underway. For example, CT DEP's 1999 Proposed Statewide Solid Waste Management Plan, though never formally adopted, identified critical issues and approaches, many of which the CT DEP has been pursuing in recent years. CT DEP has actively sought to increase source reduction and recycling, has launched pilot projects and basic research related to food waste composting, and has worked with other states to promote product stewardship through such organizations as the Northeast Recycling Council, the Northeast Waste Management Officials Association, and the Product Stewardship Institute. Meanwhile, CRRA has systematically sought to identify suitable locations for new landfill disposal capacity, has developed two museums to educate the general public and children about waste management, and, with its partners, is expanding recycling capacity and the range of materials recovered. The Southeastern Connecticut Regional Resources Recovery Authority has a museum that provides an educational experience for the public as well. Municipalities and regions have worked to boost recycling and ensure sound, efficient waste management and recycling systems. Also, in many parts of the state, there are examples of businesses, non-profit organizations, schools, and others who are working to treat wastes as resources and enhance the environment.

3.2 Guiding Principles

The following general principles will guide the implementation of Connecticut's Solid Waste Management Plan:

- **Public Health and Safety.** A fundamental requirement of proper solid waste management is the need to ensure protection of public health and safety. Consideration must be made with regard to eliminating harm to the public health and safety caused by the production, use, and disposal of products and packaging, including harm caused by the collection, transportation, storage, processing, recycling, and disposal of solid waste. Solid waste management facilities, haulers, and others associated with the management and generation of solid waste will continue to be held to strict standards to ensure that public health and safety are protected.
- **Equity and Fairness.** Waste management practices will be implemented in a way so that no segment of the population should bear a disproportionate share of the risks or consequences of environmental pollution. The principles of environmental justice need to be adhered to so that low income and minority populations are not

FROM WASTE MANAGEMENT TO RESOURCE MANAGEMENT: A LONG-RANGE VISION FOR CONNECTICUT

unduly impacted by the environmental effects of solid waste management practices, policies, and programs.

- **Integrated Waste Management Hierarchy.** Solid wastes generated in Connecticut will continue to be managed in accordance with the integrated waste management hierarchy as defined by Connecticut General Statutes 22a-228(b). The hierarchy is as follows: source reduction; recycling; composting of yard waste or vegetable matter; bulky waste recycling; resources recovery or waste-to-energy plants; and incineration and landfilling.
- **Shared Responsibility.** Solid waste management efforts in Connecticut will be guided by the principle of shared responsibility or “product stewardship”. This means that all parties involved in designing, supplying materials, manufacturing, selling, and using a product will share responsibility for environmental impacts at every stage of that product’s life. Local governments and consumers have historically borne the burden of waste management. Yet, they have little control over the materials used in the construction of products and packaging which may influence the amount of waste generated, the toxicity of the product or packaging, and its ultimate ability to be recycled or reused. Because of their central role in the product life-cycle, manufacturers must share the financial and/or physical responsibility for collecting and recycling products at the end of their useful lives. Shared responsibility also involves building partnerships and coalitions to solve specific waste management problems, and Connecticut will work with all stakeholders in an effort to gain mutual understanding and to implement innovative solutions.
- **Economic Efficiency and Environmental Sustainability.** Product manufacturing, consumption, and management of discards can cause numerous environmental impacts. These include (1) depletion of natural resources such as forests and minerals; (2) depletion of habitat associated with these resources; (3) use of energy during resource extraction, materials processing, manufacturing, and in waste management systems; and (4) release of greenhouse gases, and other air and water emissions during these life cycle stages. Waste management systems should be designed to minimize these impacts over the product lifecycle. Systems to collect, to process, to reuse, to recycle, or to dispose of wastes should be designed and operated to minimize cost and maximize effectiveness on a system-wide basis. Furthermore, through reuse and recycling, discarded materials will be processed to market specifications and used as raw material by business enterprises, thereby creating jobs and benefiting the economy. To the extent possible, waste management systems will be designed to harness and take advantage of market forces. This allows programs to be highly resilient and adapt to new circumstances over time, such as changes in markets and technologies. Natural resource extraction and product manufacturing impacts most often occur outside of Connecticut, while waste collection and processing impacts are directly experienced in the state. Therefore, Connecticut’s resource management system will yield environmental benefits within the state and the region.

3.3 Goals

The goals of the State Solid Waste Management Plan are:

Goal 1: Significantly reduce the amount of Connecticut generated solid waste requiring disposal by increasing source reduction, reuse, recycling and composting.

Take actions toward achieving an MSW diversion from disposal rate sufficient to eliminate the projected in-state disposal capacity shortfall by FY2024. That rate would equate to achieving by FY2024:

- A fifty-eight percent MSW diversion from disposal rate;
- A reduction in Connecticut's per capita disposal rate from 0.8 tons/person/year in FY2005 to 0.6 tons/person/year; and
- A tripling of the annual amount of MSW diverted from disposal.

Take actions to significantly reduce the amount of construction and demolition waste/oversized MSW disposed by increasing the current disposal diversion rate through source reduction, reuse, and recycling.

Goal 2: Manage the solid waste that ultimately must be disposed in an efficient, equitable, and environmentally protective manner, consistent with the statutory hierarchy.

Goal 3: Adopt stable, long-term funding mechanisms that provide sufficient revenue for state, regional, and local programs while providing incentives for increased waste reduction and diversion.

With the vision, guiding principles, and goals in place, Connecticut's Solid Waste Management Plan will result in a comprehensive approach to managing the state's solid waste. All of Connecticut's citizens and businesses will play critical roles in achieving these goals.

Chapter 4

MOVING TOWARDS CONNECTICUT'S VISION: OBJECTIVES AND STRATEGIES

4.1 Overview

Moving toward the vision of treating wastes as resources, as described in Chapter Three, will take time and a coordinated commitment by Connecticut residents, businesses, government agencies, waste management and recycling firms, product manufacturers and others. Success will require substantial changes in Connecticut's current solid waste management system.

While Connecticut can be proud of the solid waste management system it has built and the many efforts to further enhance it, continuing to move toward the vision outlined in this Plan requires a systematic reinvigoration of source reduction, recycling and composting efforts, combined with enhancement and expansion of a support network to promote innovation and growth in waste diversion from disposal over the long term. This chapter presents a blueprint for this effort.

To bring Connecticut's vision closer to reality, Connecticut's local and state agencies, citizens, businesses, and industries will need to work towards achieving the following objectives:

1. **Source Reduction** – Catalyze shifts in consumer, business, product manufacturing, and solid waste processing practices that reduce the amount and toxicity of waste generated in Connecticut.
2. **Recycling and Composting** – Move aggressively to strengthen Connecticut's public and private reuse, recycling and composting efforts and infrastructure to increase the quantity and quality of recovered materials and to build resilient, highly efficient and continually improving programs to reduce the amount of solid waste Connecticut disposes, both now and in the future. Therefore, Connecticut needs to maximize recycling and composting for all types of solid waste generated in the state. Throughout the Plan, recycling includes composting and composting efforts refer only to the composting of source-separated organic material.
3. **Management of Solid Waste Requiring Disposal** – Assure that the need for new disposal capacity is minimized, that existing solid waste facilities are used as efficiently as possible, and that the public is fully aware of the potential need for and impacts of disposal options and specific proposals, through a robust public participation process.
4. **Management of Special Wastes and Other Types of Solid Waste** – Maximize source reduction, recycling, and beneficial use of special waste and other types of solid waste in a manner that protects human health and the environment; and also assure that special waste and other types of waste that require disposal are

MOVING TOWARDS CONNECTICUT'S VISION: OBJECTIVES AND STRATEGIES

disposed in compliance with the State's solid waste management hierarchy in facilities that meet all regulatory standards for protection of human health and safety, natural resources and the environment.

5. **Education and Outreach** – Significantly increase awareness and understanding of waste management needs, impacts and the critical social, economic, and environmental issues facing Connecticut, and build support for programs to engage citizens in actions needed to maximize waste reduction and recycling and minimize the need for additional disposal capacity.
6. **Program Planning, Evaluation and Measurement** – Enhance local, state and regional planning, measurement and program evaluation practices to drive continual progress towards achieving Connecticut's waste management goals.
7. **Permitting and Enforcement** - Ensure that permitting and enforcement decisions promote the goals of the Plan and are made in a manner that is fully protective of human health and the environment; promote continuous improvement of the environmental permit application review and decision making process; achieve the highest level of environmental compliance through predictable, timely, and consistent enforcement and effective compliance assistance where appropriate; and improve communication with municipalities, business, industry, and the public on the regulatory process in order to facilitate and improve compliance with environmental requirements.
8. **Funding** – Adopt stable, long-term funding mechanisms that provide sufficient revenue for state, regional and local programs while providing incentives for increased source reduction and recycling.

With this Plan, Connecticut is charting an aggressive and transforming course in the area of solid waste management. Waste that cannot be source reduced, recycled or composted will need to be disposed of in an efficient, equitable, and environmentally protective manner. In order to achieve these goals, it will be necessary to adopt stable, long-term funding mechanisms that provide sufficient revenue to implement this Plan.

New technologies to recover energy in an environmentally sound manner from solid waste which cannot be source reduced, recycled or composted will be explored and assessed. Resources recovery facilities will continue to employ up-to-date technology so as to continue to play a vital role in recovering energy from the remaining waste stream in an efficient and environmentally sound manner. Finally, landfills will be used as a last resort to manage remaining wastes not suitable for materials or energy recovery.

However, the Department recognizes that if the aggressive 58 percent MSW disposal diversion rate is not achieved by FY2024, there will be a shortfall of in-state MSW disposal capacity. The Department also recognizes that there is significant in-state disposal capacity shortfall for construction and demolition waste and oversized MSW and the availability of in-state options is very limited at this time. The State must identify and assess risks and plan prudently for how the State will deal with potential increased future reliance on out-of-state disposal capacity for MSW, construction and demolition waste, and oversized MSW, and must identify the circumstances under

which new in-state disposal capacity would be consistent with this Plan. At the same time, the State must try to assure that additional disposal capacity available to Connecticut waste generators does not create disincentives to the development and utilization of the critical recycling and composting infrastructure that is the centerpiece of this Plan.

4.2 Projected Connecticut Solid Waste Generation and Disposal: the Framework for the Plan

Tables 4-1, 4-2, and 4-3 present projections for the generation and disposal of Connecticut generated solid waste for the planning period FY2005 through FY2024. The projections found in these tables were used to develop the disposal diversion goal for MSW and to predict future needs for disposal capacity for Connecticut generated MSW, RRF ash residue, and construction and demolition (C&D) waste/oversized MSW. More detailed tables can be found in Appendix J.

4.2.1 MSW

Table 4-1 provides projections of Connecticut MSW generation and in-state disposal capacity for the planning period. The amount of MSW generated in Connecticut is projected to increase by approximately 1.4 million tons over the planning period, from 3.8 million tons in FY2005 to 5.2 million tons in FY2024.

Connecticut must meet its 58 percent waste disposal diversion target by FY2024 in order to eliminate a MSW disposal capacity shortfall by FY2024.

Should Connecticut fall short of a 58 percent MSW disposal diversion rate by FY2024, the following projections are made:

- With attainment of a 49 percent diversion rate by FY2024 the annual in-state disposal capacity shortfall in FY2024 would be approximately 471,000 tons. Attainment of this diversion rate would maintain the amount of MSW disposed per year at a constant level for the planning period of twenty years.
- With attainment of a 40 percent diversion rate by FY2024, the annual in-state disposal capacity shortfall in FY2024 would be 931,000 tons.
- If the annual disposal diversion rate remains at 30 percent (the current estimated level) through FY2024 the annual in-state disposal capacity shortfall in FY2024 will be 1.5 million tons.

**MOVING TOWARDS CONNECTICUT'S VISION:
OBJECTIVES AND STRATEGIES**

Table 4-1 Projection of Connecticut MSW and In-State Disposal Capacity based on a 58 Percent Disposal Diversion Rate and No New In-state MSW Disposal Capacity for the period FY2005 – FY2024						
Fiscal Year	MSW Generated (000 tpy) ⁽¹⁾ ⁽²⁾	Percent Diverted ⁽³⁾	MSW Diverted (000 tpy)	MSW Disposed (000 tpy)	In-State Disposal Capacity (000 tpy) ⁽⁴⁾	In-State Capacity Shortfall (000 tpy) ⁽⁵⁾
2005	3,805	30	1,133	2,671	2,344	327
2010 ⁽⁶⁾	4,118	37	1,523	2,594	2,209	385
2015	4,476	45	2,014	2,462	2,209	253
2020	4,879	52	2,537	2,342	2,209	133
2024	5,233	58	3,035	2,198	2,209	0
<p>If Connecticut does not achieve a 58 percent disposal diversion rate by 2024, projections for in-state disposal capacity shortfalls for the year 2024 at the 49 percent, 40 percent, and 30 percent disposal diversion rates are:</p> <ul style="list-style-type: none"> ▪ 49 percent = 471,000 tons in-state disposal capacity shortfall ▪ 40 percent = 931,000 tons in-state disposal capacity shortfall ▪ 30 percent = 1,454,000 tons in-state disposal capacity shortfall 						
<p>Projections were based on the following assumptions:</p> <ol style="list-style-type: none"> 1. TPY is defined as Tons per Year. 2. MSW generation projections based on projections of Connecticut's population from US Census Bureau and on the Gross State Product. 3. The percent of MSW diverted from disposal = the amount of MSW recycled and composted divided by the amount of MSW generated. For FY2005, the 30 percent diversion rate was projected based on FY2003 reported and estimated amounts of material recycled and composted; the estimated amounts included additional commercial recycling (not reported) and estimates of bottle bill material recycled. 4. In-state MSW Disposal Capacity = In-State Landfill Capacity (based on amount of MSW disposed in FY2004) plus In-State Resource Recovery Facility capacity (based on the fiveyear average processed at CT RRFs FY2000-FY2004). Assuming no new disposal capacity added. 5. In-State Disposal Capacity Shortfall = MSW disposed minus In-state Disposal Capacity. 6. Hartford Landfill closes in June 2006; resulting in a reduction of 84,000 tons/year of MSW (process residue) starting in FY2007; Windsor-Bloomfield Landfill closes in December 2007 resulting in a reduction of 26,000 tons/year of MSW disposal capacity starting in FY 2008 and no disposal capacity for this landfill thereafter. For planning purposes, Wallingford RRF is assumed to remain open. In the fall of 2006, CRRA submitted a revised closure plan for the Hartford Landfill to the CT DEP, decision is pending. 						

4.2.2 RRF Ash Residue

Table 4-2 provides projections of the generation of Connecticut RRF ash residue requiring disposal and the in-state disposal capacity, based on a set of assumptions (noted in the table), including that no new MSW RRF capacity will be built in-state. Connecticut's six MSW RRFs generate ash residue that requires disposal in quantities that are between 23 percent to 33 percent (average of 25 percent) of the weight of the waste incinerated; this does not include the metal that is recovered from the ash. Currently, Connecticut's RRFs generated ash residue is disposed in landfills, both in-state and out-of-state. Connecticut has two lined ash landfills. One, the CRRA Hartford RRF ash landfill, will be reaching capacity in late 2008. The other, the Wheelabrator owned Putnam land fill, is projected to have additional capacity through most of FY2018.

**MOVING TOWARDS CONNECTICUT'S VISION:
OBJECTIVES AND STRATEGIES**

**Table 4-2
Projections of Generation of Connecticut RRF Ash Residue Requiring Disposal and In-State Disposal Capacity Assuming No New MSW RRF Capacity Will be Built in Connecticut FY2005 – FY2024**

Fiscal Year	Projected Remaining In-State Ash Disposal Capacity (000 tons) ^{(1) (2)}	MSW Processed at CT RRFs (000 tpy)	RRF Ash Residue Requiring Disposal ^{(3)/} Disposed In-State (000 tpy)	Cumulative Capacity Shortfall (000 tons)
2005 ⁽⁴⁾	7,501	2,209 ⁽⁵⁾	551/506	0
2010 ^{(6) (7)}	4,928	2,209	551/551	0
2015	2,176	2,209	551/551	0
2018	524	2,209	551/524	27
2019 ⁸	0	2,209	551/0	578
2020	0	2,209	551/0	1,129
2024	0	2,209	551/0	3,333

Projections were based on the following assumptions:

1. Assumes current ash disposal capacity decreasing annually with amounts shown.
2. In-state RRF Ash Disposal sites are the Hartford Landfill (CRRA) and the Putnam Ash Landfill (Wheelabrator Putnam, Inc).
3. Assumes ash generation rate reflects average MSW RRF ash generation requiring disposal per year based on the period FY2000-FY2004.
4. Assumes that ash disposal capacity at the Hartford Landfill will be available to dispose of RRF from Mid-CT RRF until October 2008.
5. Based on fiveyear average of waste burned at in-state RRFs for the period (fiscal years) 2000 through 2004.
6. Assumes that Bristol's RRF ash is disposed in-state after its current contract with Seneca Meadows landfill in NY expires in June 2008.
7. For planning purposes, Wallingford RRF is assumed to remain open .
8. The Putnam ash landfill is expected to reach capacity and close by the end of FY2018.

4.2.3 C&D Waste/Oversized MSW

Table 4-3 provides projections of Connecticut generated C&D waste/oversized MSW and in-state disposal capacity, assuming no increase in the diversion from disposal. As a result of Connecticut's limited landfill disposal capacity for C&D waste and oversized MSW and the challenges to source reduce or recycle this waste stream, the state already faces a significant in-state disposal capacity shortfall. It is projected that if Connecticut does nothing to increase source reduction and recycling, the in-state disposal capacity shortfall will grow from 940,000 tons in FY2005 to 1.4 million tons per year by FY2024.

**MOVING TOWARDS CONNECTICUT'S VISION:
OBJECTIVES AND STRATEGIES**

**Table 4-3
Projections of Connecticut C&D Waste/Oversized MSW ⁽¹⁾ Generation ⁽²⁾ and
In-State Disposal Capacity
Assuming No Increase in Diversion from Disposal
FY2005 – FY2024**

Fiscal Year	C&D Waste/ Oversized MSW Processed or Disposed by CT Solid Waste Facilities ⁽³⁾ (000 tpy)	Percent C&D Waste/ Oversized MSW Diverted from Disposal ⁽⁴⁾	C&D/Waste/ Oversized MSW Disposed ⁽⁵⁾ (000 tpy)	Estimated In- State Disposal Capacity ⁽⁶⁾ (000 tpy)	C&D Waste/ Oversized MSW Capacity Shortfall ⁽⁷⁾ (000 tpy)
2005	1,145	7	1,066	126	940
2010 ⁽⁸⁾⁽⁹⁾	1,240	7	1,153	67	1,086
2015	1,342	7	1,248	73	1,175
2020	1,453	7	1,351	79	1,272
2024 ⁽¹⁰⁾	1,548	7	1,440	4	1,436

Projections were based on the following assumptions:

- Oversized MSW is not consistently reported; sometimes it is reported as bulky or C&D waste (included in this table); sometimes it is reported as MSW (included in tables presenting CT MSW figures); CT definitions for bulky waste and MSW contribute to this confusion.
- The figures presented in this table are based on C&D waste and "bulky waste" data reported by CT C&D volume reduction facilities (VRFs), CT transfer stations (TSs), CT Dept. of Transportation and CT landfills (LFs). This table does not include figures regarding clean wood reported recycled by CT recycling facilities or by CT municipalities. Figures reported for FY2004 have been escalated 1.6 percent to arrive at FY2005 estimates.
- C&D waste projections based on FY2004 C&D waste and "bulky waste" data reported to DEP (see footnote #1) and assumes a 1.6 percent annual increase in the amount of such waste generated.
- The 7 percent diversion (recycling) rate is the CT current C&D waste diversion rate as calculated from data submitted to the CT DEP as described in footnote #2. It does not include most of the clean fill generated and recycled or reused.
- Disposed both in-state and out-of-state.
- In-State disposal includes current landfill capacity for FY2005. After FY2005, assume landfills accept 1.6 percent more waste per year.
- C&D Waste Disposal Capacity Shortfall = C&D waste Oversized MSW disposed minus C&D waste/Oversized MSW In-State Disposal Capacity.
- Assumes Hartford Landfill* which is currently receiving 27,000 tons/year of bulky waste and oversized MSW (i.e. in FY2005) closes in 2006. In the fall of 2006, CRRRA submitted to the CT DEP a revised closure plan for the Hartford Landfill, decision pending.
- Assumes Windsor-Bloomfield Landfill receiving 39,000 tons in FY2005 closes December 2008, resulting in a reduction of 20,000 tons of disposal capacity in FY2009 and an additional reduction of 20,000 tons of disposal capacity in FY2010.
- Assumes the Manchester Landfill extends its permit and continues to operate, closing in 2022.

4.3 Objectives And Strategies

To move forward in addressing these critical issues, the Plan presents objectives and strategies that will position Connecticut to best manage the state's solid waste for the planning period, with a particular focus over the next five-year timeframe. This Chapter outlines the eight objectives developed to support the overall goals of the Plan and is structured to include a statement of the objective, an overview of the issue, a description of the current practices, barriers, and opportunities, and outlines specific strategies. Chapter Five contains a comprehensive listing of all the strategies and

outlines the type of action needed, establishes priorities, estimates costs, sets forth time frames, and assigns lead responsibilities.

A critical strategy of this Plan is the recommendation to establish an Agency Solid Waste Management Advisory Committee (Strategy 6-3). This newly created Committee will include representatives from government, regional waste management authorities, the solid waste management industry, the recycling sector, community and environmental groups, business and waste generating industries and other stakeholders. The Advisory Committee will assist in implementing the Plan, participate in any revisions to the Plan as necessary, and identify emerging issues and seek solutions. Under many of the objectives and strategies listed, this Advisory Committee is to assume an integral role in the implementation of the Plan. The Advisory Committee's involvement in the on-going process will be critical to the success of achieving the goals as set forth in this Plan.

4.3.1 Objective 1- Source Reduction

The objective of source reduction is to catalyze shifts in consumer, business, product manufacturing, and solid waste processing practices to reduce the quantity and toxicity of solid waste generated in Connecticut including the quantity and toxicity of residue generated by RRFs and construction and demolition volume reduction facilities.

Overview – Source Reduction

Source reduction (consuming and throwing away less) is also referred to as pollution prevention and results in a reduction in the amount and/or toxicity of waste generated. Waste is generated throughout the life cycle of a product, beginning with extraction of raw materials, throughout transportation, processing and manufacturing, during use, and by its disposal at the end of its useful life. Source reduction can be defined as any change in the design, manufacturing, purchase, or use of materials or products, including packaging, that reduces the amount or toxicity of waste associated with those materials or products. It is the highest priority in the hierarchy of effective solid waste management and is generally acknowledged to have the greatest benefits in terms of reducing waste management and product manufacturing costs, and reducing environmental burdens like natural resource use, energy use and air and water emissions. It is also perhaps the most challenging integrated solid waste management option since it involves changes in well-established manufacturer and consumer practices and requires businesses, industries, and consumers to reduce both the quantity and toxicity of wastes that they generate. Product and material reuse will be included in this discussion of source reduction.

Current Source Reduction Practices

Current Source Reduction Practices for Reducing the *Toxicity* of Solid Waste

Major concerns regarding toxicity in solid waste relate to the presence of toxic substances such as mercury, lead, dioxin, and cadmium in products and materials that are disposed and the generation of those toxic substances during the manufacturing

MOVING TOWARDS CONNECTICUT'S VISION: OBJECTIVES AND STRATEGIES

process. Connecticut encourages manufacturers and industries to reduce the toxicity of their consumer products. There has been significant progress in reducing the toxic content of certain products. Some of these actions have been voluntary, while others have been legislated and include:

- CT DEP's Pollution Prevention Plan. Though dated, the Plan establishes goals and identifies strategies to reduce the quantity and toxicity of wastes discharged to the land, air, and waters of the state.
- Public Act 02-90, An Act Concerning Mercury Education and Reduction. This law established a comprehensive program aimed at the virtual elimination of mercury in consumer, household and commercial products. This law was codified into CGS Sections 22a-612-625 Mercury Reduction and Education and includes the following:
 - Product phase out;
 - Sale bans for mercury-containing: fever thermometers, dairy manometers, and novelties;
 - Product and packaging labels and consumer warnings in care and use manuals that indicate that products contain mercury and provide information as to how they should be managed;
 - Requirements for manufacturers of mercury-containing products to reduce their mercury content and to develop collection systems for those products to ensure that mercury-containing products are properly managed at the end of their useful life;
 - Requirements for retailers who sell mercury-added lamps to industrial, commercial, or office building owners to notify the purchaser or person who replaces or removes such lamps that they contain mercury and cannot be thrown out in the garbage for disposal; and
 - Storage, handling and use requirements for dental offices that handle mercury to minimize exposure under CT DEP adopted Best Management Practices. Vocational dental education or training schools are required to develop and to implement plans to properly handle and recycle or dispose of waste elemental mercury and amalgam.
- Paint manufacturers voluntarily stopped producing mercury-containing paints in 1991.
- Manufacturers of computers and other consumer electronics products are starting to reduce their use of lead, mercury and other toxic substances. To some degree, this is in response to legislation in the European Union that requires the elimination of these materials.
- Connecticut statutes require reduced mercury content of alkaline manganese and zinc carbon batteries (CGS Sections 22a-256d, 22a-256e). National legislation bans the sale of mercuric oxide button cell batteries and limits the introduction of mercury to alkaline manganese and zinc carbon batteries ("Mercury Containing

and Rechargeable Battery Management Act”, 1996). Connecticut legislation adopted in 2006 phases out the use of mercury in remaining button cell batteries.

- Toxics in packaging legislation that was adopted by Connecticut and eighteen other states and several foreign countries has resulted in a steady decline in the presence of heavy metals in packaging throughout this country. In Connecticut, the sale of packaging with the intentional introduction of lead, mercury, cadmium, or hexavalent chromium was prohibited as of October 1992. In addition, limits have been placed on incidental levels of these metals in packaging (CGS Section 22a-255i). Manufacturers are required to certify that their packaging complies with these laws and provide these certifications to distributors and retailers upon request. Retailers and distributors are encouraged to adopt these requirements into their purchasing specifications and to routinely request certificates of compliance from manufacturers. As a member of the Toxics in Packaging Clearinghouse, the CT DEP is currently participating in an assessment being conducted on all types of packaging in the member states for the purpose of uncovering noncompliant packaging.
- The CT DEP is working with large institutions in Hartford, including hospitals and college laboratories, to become models of pollution prevention.
- The CT DEP and the Connecticut Department of Administrative Services (DAS) initiated a program to research and promote the purchase of environmentally preferable products by all Connecticut State agencies. In 2006, Governor Rell issued Executive Order No. 14 which required State agencies to procure and use, whenever practicable, cleaning and/or sanitizing products having properties that minimize potential impacts to human health and the environment, consistent with maintaining clean and sanitary State facilities.
- The CT DEP maintains a web page dedicated to pollution prevention which includes information concerning past workshops, case studies and certain targeted research projects for such industries as dry cleaning and auto body shops. The web site also has information to assist individuals with reducing waste toxicity generated in the home.

Current Source Reduction Practices for Reducing the *Quantity* of Solid Waste

Based on solid waste facility reports submitted to the CT DEP, the amount of MSW generated per person (at work and at home) in Connecticut has been rising steadily from an average of 4.8 lbs/person/day in FY1992, the first year of analyzed data in the CT DEP solid waste management data base to an estimated 6lbs/person/day in 2006. Although some of the observed increase can be attributed to better reporting, there has been a real increase in the amount of trash produced. We have progressively become a *throw-away* society, addicted to buying new things, the convenience of single use products, and with no general awareness of the environmental costs of that lifestyle. However, a variety of source reduction actions have been taken by some individuals and businesses to reduce the amount of waste they produce. Table 44 lists these actions taken and some of these are described below:

MOVING TOWARDS CONNECTICUT'S VISION: OBJECTIVES AND STRATEGIES

- **Light weighting of products:** Some effective source reduction measures have been applied to the design and manufacturing production of products and packaging. Examples include reduction in the amount of aluminum or glass used in a 12-ounce beverage container, or the average thickness of newsprint. Manufacturers have strong incentives for such lightweighting since they directly contribute to their bottom line by reducing their raw material costs and fuel costs associated with transportation of packaged goods. Measuring the impact of such efforts in Connecticut is difficult, since the mix of products and packaging in the waste stream is constantly changing. However, a 1998 study conducted by Franklin Associates for the Connecticut Resources Recovery Authority estimated that approximately 155,000 tons per year reduction in MSW generation could be attributed to Connecticut as a result of national industrial source reduction practices.
- **Consumer and Work Practices:** There has been some effort in Connecticut to promote source reduction practices at home and at work. In the early 1990s, the CT DEP held workshops and drafted fact sheets promoting “pre-cycling” which encouraged individuals to shop in a more environmentally aware manner, such as by using reusable grocery bags, avoiding throw-away and over-packaged products, and buying less in general. Individuals were also encouraged to generate less waste at the office. The CT DAS, acting pursuant to CGS Section 4a-67b, developed and implemented a plan to eliminate by stages the use of disposable and single-use products in State government. CGS Section 4b-15 requires State agencies to reduce the use of disposable and single-use products in accordance with the DAS plan, however, additional attention is needed in this area.
- **Pay-as-You-Throw:** Eleven Connecticut municipalities and a number of waste haulers have implemented pay-as-you-throw (“PAYT”) or unit-based pricing programs for solid waste collection. Under PAYT programs, generators will pay more if they dispose of more waste, thereby creating an incentive for waste generators to produce less waste.
- **Re-Use:** Some municipalities operate “swaps” at their transfer stations and recycling drop-off sites to encourage reuse of products. Connecticut participated in a Northeast Recycling Council project to promote reuse and waste prevention to New England school and municipal purchasing agents by developing an understanding of the economic and environmental benefits of using materials exchanges, as well as State surplus property programs. Also, a building materials reuse business was recently started up in Connecticut and was the recipient of funding from a CT DEP enforcement penalty. The CT DEP promotes and encourages the use of material exchanges and provides information on material exchanges on its website. In addition to consignment shops located throughout the state, there are a number of web-based residential material exchanges and used product websites.

Table 4-4 List of Some Common Waste Reduction Actions		
<ul style="list-style-type: none"> ■ unit-based pricing (PAYT) ■ light weighting (bags, cartons, glass, plastic, bottles, cans) ■ refillable containers ■ elimination of redundant packaging ■ reuse of bags, boxes, etc. ■ bulk dispensers for food 	<ul style="list-style-type: none"> ■ materials waste exchanges ■ donation of unused food to charity ■ decreased newsprint weight ■ e-mail ■ double-sided copies ■ decreased direct mail 	<ul style="list-style-type: none"> ■ donation of unwanted clothes, appliances, furniture to charity ■ reuse of wood pallets ■ concentrated products (e.g. laundry detergents) ■ more durable appliances ■ repair/reuse of appliances ■ tag sales to promote reuse

Barriers to Achieving Waste Source Reduction

Achieving real progress in source reduction is extremely challenging for many reasons, including:

- Reducing the quantity of waste we generate competes with the ongoing promotion of product consumption;
- Information on the toxicity of waste associated with products, and on less wasteful or toxic alternatives, is not readily available;
- Increased consumer reliance on catalog and internet shopping has increased the generation of shipping and packaging materials;
- There are other issues competing for people's time, concern, and attention and source reduction is just one more issue and people feel no immediate sense of urgency to deal with it;
- Pricing for waste management disposal services, especially for residential services, often does not provide an incentive for reducing waste; and
- While cost incentives exist for manufacturers to reduce the weight of products and packaging, there may not be as strong an economic incentive to reduce toxicity or to make products more durable.

Source Reduction Opportunities and Priorities

The opportunities to reduce the amount and toxicity of waste generated in Connecticut can be grouped by the type of product and/or the type of waste generator. Listed below are priorities for source reduction efforts in Connecticut:

- **Change purchasing practices by the public and private sectors to promote sales of less wasteful and less toxic products.**

Consumers must be encouraged to shift their purchasing preference practices to choose products that are reusable and more durable rather than disposable; and choose

MOVING TOWARDS CONNECTICUT'S VISION: OBJECTIVES AND STRATEGIES

product alternatives that are made without, or with fewer, toxic or hazardous components. To make this shift happen, consumers need to understand the need and options for source reduction, have better information about product waste and toxicity, more product choices, and incentives to make those changes. All Connecticut citizens, businesses, government agencies, schools, and non-profit organizations have opportunities to reduce waste and toxicity.

- **Promote change in business and industry practices to reduce waste generation, including paper waste and waste related to transport packaging.**

Connecticut can play a leadership role in promoting new practices that will reduce waste locally and nationwide. Large corporate office complexes and government may present a great opportunity to undertake waste reduction activities. For example, they can shift to electronic record keeping thereby eliminating or reducing paper records, and reduce the amount of paper used in interoffice communications, in documents mailed to customers and clients, and in unsolicited mail advertising. Businesses and manufacturers can reduce the amount of transport packaging waste including increased packaging waste resulting from the growth of on-line purchasing. These entities can also help to educate their customers and supply chain about source reduction opportunities.

- **Change practices in the construction industry to reduce the use of products containing toxic substances and to reduce waste.**

The construction industry, including architects and product suppliers, play a very important role since they can influence not only the waste associated with the construction process, but the built environment in which we live and work every day. This industry can adopt green building practices to achieve substantial source reduction results. In addition, there may be opportunities within the state building code to incorporate requirements for deconstruction and to incorporate solid waste management issues in the required Environmental Impact Assessments under the Connecticut Environmental Protection Act.

- **Change manufacturer practices so as to produce consumer electronic products using less toxic substances in this country to mirror the changes being made in products sold to European countries.**

The computer and consumer electronics industries currently use a number of toxic or hazardous materials in their products, including mercury, lead and chromium. Many original equipment manufacturers are taking steps to phase out these materials, in large part in response to European legislation requiring the elimination of toxic materials. In the U.S., California has adopted legislation requiring consumer electronics to adhere to the European regulations on hazardous substances. The U.S. EPA recently supported the development of the Electronic Product Environmental Assessment Tool ("EPEAT"), a procurement tool to help large purchasers in the public and private sectors evaluate, compare and select electronic products such as computers and monitors based on their environmental attributes. EPEAT also helps manufacturers promote environmentally preferable products.

Strategies to Reduce the Amount and Toxicity of Solid Waste Generated

Strategy 1-1. Continue to implement the CT DEP's Pollution Prevention Plan that establishes goals and identifies strategies to reduce the quantity and toxicity of wastes discharged to the land, air, and waters of the state.

In 1996, the CT DEP published the Pollution Prevention Plan for Connecticut, a document designed to guide the Department in its efforts to prevent pollution statewide. Preventing pollution requires a shift in how businesses operate, how consumers go about their daily activities, and how institutions are run. The Plan emphasized education and outreach to create an awareness of pollution prevention opportunities for all sectors of the community, including consumers, businesses, and institutions, to form partnerships and invite voluntary participation. In 1999, the CT DEP evaluated the success of the Plan's implementation strategies and it was determined that good progress had been made and efforts needed to continue. More recently, the Department has identified new challenges and is now addressing such issues as climate change, sprawl, and the use of green building techniques and renewable energy. These issues all involve, at least in part, consideration of how we can create less waste, either through utilizing existing infrastructure when expanding our economy, building structures that last longer or can be recycled, and beneficially using waste materials.

Strategy 1-2. Educate consumers and businesses about the effects of their purchasing choices and behaviors on waste generation, and provide education and incentives to help change purchasing and behavioral practices to reduce the amount and toxicity of waste produced.

Education is the first step in encouraging change. The CT DEP, in partnership with environmental and civic organizations, will implement a program to educate consumers and businesses about the environmental and human costs associated with purchasing choices. But awareness alone will not necessarily effectuate change, and product choices and incentives will need to be available as well. The CT DEP will continue to promote EPA's WasteWise Program in Connecticut. This EPA Program is a free and voluntary through which organizations can eliminate costly municipal solid waste and select industrial wastes, benefiting their bottom line and the environment. WasteWise is a flexible program that allows partners to design their own waste reduction programs tailored to their needs; partners range from small local governments and nonprofit organizations to large, multinational corporations. The CT DEP will expand current pollution prevention outreach to provide information regarding sources for environmentally preferable products and behavior changes that will reduce the amount and toxicity of the waste generated. The CT DEP will work with the Agency's Solid Waste Management Plan Advisory Committee (the "Committee") and with the business and industry sectors and institutions to decrease their waste disposal rates through increased source reduction by promoting programs such as re-usable substitutes for non-recyclable/non-reusable transport packaging.

Strategy 1-3. Continue to support regional and national efforts to change manufacturer practices to produce products that generate less waste and less toxic waste.

CT DEP will promote, support, and disseminate information about efforts to change how we manufacture and use products through the promotion of best practices where energy and material use is optimized, and wastes and pollution are minimized.

Strategy 1-4. Continue to promote environmentally preferable purchasing (EPP) standards in state and local government; encourage state agencies and municipalities to become members of EPA's WasteWise Program; and support green design standards and encourage their adoption by Connecticut local governments and institutions.

Environmentally preferable purchasing involves using criteria related to source reduction, recycling and other environmental concerns to guide purchasing decisions. The CT DEP will continue to provide support to the CT DAS to promote the purchase of environmentally preferable products by State agencies and municipalities. Pursuant to Governor Rell's Executive Order No. 14 issued in 2006, the CT DEP will work with DAS and other State Agencies to establish and write standards and guidelines to provide direction to all State agencies regarding the procuring and use, whenever practicable, of cleaning and/or sanitizing products having properties that minimize potential impacts to human health and the environment. The CT DEP will also promote EPA's WasteWise program to State agencies and municipalities. The CT DEP recognizes that there are many opportunities in building renovation and construction where source reduction and re-use can occur. The CT DEP will assist the State of Connecticut's Office of Policy and Management (OPM) in adopting building construction standards that are consistent with or exceed the silver building rating of the Leadership in Environmental Energy Design (LEED-is a U.S. Green Building Council Program that promotes "green building" initiatives and programs) rating system for new commercial construction and major renovation projects, as established by the United States Green Building Council, or an equivalent standard. The CT DEP will encourage local governments and institutions to adopt these types of building standards.

Strategy 1-5. Provide funding to promote reuse and publicize product reuse opportunities.

The CT DEP will sponsor and build partnerships that can include state and local governments, regional waste authorities, the private sector, and community groups to support reuse opportunities. Product reuse is a method of reducing the amount of waste generated and has potential to be revitalized and expanded in Connecticut. Some examples of reuse opportunities include:

- Support existing material waste exchanges, such as the Southern New England Waste Exchange, and building material reuse centers, such as the Bridgeport Connecticut Habitat for Humanity ReStore and the ReCONNstruction Center

located in New Britain, by disseminating information promoting their use and seeking funding to help support their development; and

- Dissemination of information promoting reuse and repair operations.

Strategy 1-6. Promote through such activities as technical assistance, start-up funding, and/or other incentives, the implementation of effective pay-as-you-throw (PAYT) pricing systems by municipalities and haulers for managing solid waste from residents and small businesses to achieve waste reduction.

The CT DEP should develop and adopt strong incentives for local governments to adopt PAYT pricing systems. Endorsement and promotion by Connecticut's municipal groups of PAYT would greatly assist in the acceptance and establishment of this type of waste management program for local implementation. PAYT, when implemented with good education and associated source reduction and recycling programs, has been documented repeatedly to be an effective incentive for waste reduction.

Strategy 1-7. Seek partnerships, provide funding, and coordinate a model source reduction program to reduce the amount and toxicity of solid waste generated in at least one Connecticut community.

The CT DEP proposes that a model source reduction program be developed and implemented for the purpose of demonstrating the scope of what is possible, incorporating source-reduction strategies and other related strategies as identified in this Plan. Some of the strategies that could be implemented could include: reducing the amount of unsolicited mail received by residents; encouraging purchase of products with reduced packaging and/or with reduced toxicity, and durable products in lieu of disposable, single use products; encouraging reuse through a town swap program and education about material exchanges; promoting sustainable and organic landscaping design and maintenance which can result in waste reduction; and promoting source reduction practices such as two-sided copying and paperless offices in businesses. The model can demonstrate how programs can be tailored to Connecticut's specific conditions and chart a course for other communities to source reduce their waste. The CT DEP will work towards securing resources, enlisting partners and selecting the model community. The CT DEP would then work closely with local and regional government agencies, private industry, trade associations, universities, Non-governmental organizations (NGOs) and others to implement similar programs and document the waste reduced, the environmental benefits achieved, and the money saved.

Strategy 1-8. Continue to enforce Connecticut's Toxics in Packaging Act and other toxic reduction programs and efforts. Continue to work in conjunction with the Toxics in Packaging Clearing House and other member states to assess compliance rates with toxics in packaging laws.

The CT DEP will continue its efforts to ensure compliance with Connecticut's Toxics in Packaging Act and will continue to actively participate in the Toxics in Packaging Clearing House. The CT DEP will continue in its assessments of all types of

packaging and will conduct follow-up outreach activity where warranted to bring suppliers and manufacturers into compliance with the toxics in packaging law. Where lack of compliance is found, the CT DEP will take appropriate action under its jurisdiction.

4.3.2 Objective 2- Recycling And Composting

Move aggressively to strengthen Connecticut's public and private recycling and composting efforts and infrastructure to increase the quantity and quality of recovered materials and to build resilient, highly efficient and continually improving programs to reduce the amount of solid waste Connecticut disposes, both now and in the future.

Overview – Recycling and Composting

While source reduction is higher on the integrated waste management hierarchy, recycling and composting have the greatest potential to move Connecticut toward its vision of reducing the amount of waste it disposes and treating the waste that it generates as a resource. This Objective 2 deals mainly with recycling and composting of MSW, while Objective 4 discusses recycling and composting for C&D waste, land clearing debris, oversized MSW, electronics, and other solid wastes.

The benefits of recycling and composting are not limited to reducing the amount of solid waste requiring disposal. Recycling and composting activities: provide an environmentally preferable raw material to manufacturing enterprises, reducing the need for natural resource extraction and thereby conserving precious resources and habitat; provide raw material that is far more efficiently collected and processed, saving energy and reducing green house gas emissions, and reducing the emission of pollutants to our air, land, and water; reduce waste disposal costs; and represent a significant force in the U.S. economy.

Connecticut has made great strides in recycling and the amount of MSW recycled has been increasing steadily since recycling became mandatory in 1991 but the percent of MSW recycled has leveled off. It is estimated that Connecticut currently recycles 1.133 million tons or 30 percent of the MSW generated, based on FY2003 reported data and estimates of unreported recycling, both projected to FY2005. Although an MSW recycling rate of 30 percent is consistent with the 2001 national average, it is far short of the State's 2000 statutory source reduction/recycling goal of 40 percent. Unfortunately, over the years, the percentage of MSW recycled remains steady, even though the amount of waste generated grows, resulting in the disposal of increasing amounts of MSW. The failure of Connecticut to achieve its recycling/source reduction rate can be partly attributed to the lack of resources available to: sustain and increase recycling participation rates; increase source reduction efforts; assess the state's recycling program and amend it as necessary to make it more effective; and take advantage of changing technologies, changing waste streams, changing market conditions, and untapped recycling/potential for some components of the waste stream.

This Plan calls for renewed, reinvigorated, and expanded efforts at recycling and composting. The Plan identifies a 58 percent MSW disposal diversion rate by the year 2024 so that there will be a zero in-state disposal capacity shortfall by that date. This means that Connecticut will have to divert approximately three times the amount of MSW (three million tons) currently being diverted from disposal through source reduction, recycling and composting by the year 2024.

The implementation of new programs to divert more food scraps from the waste disposal stream will be one major strategy in helping to achieve that goal. According to the U.S. EPA MSW characterization for 2003, food scraps account for close to twelve percent of the MSW generated in this country. Connecticut is currently recovering only a small part of that waste-stream, therefore the potential to increase food waste recovery is substantial.

This Plan's targeted MSW disposal diversion rate is consistent with the Connecticut Climate Change Action Plan 2005 recommendation that called for an increase in recycling and source reduction of municipal solid waste. In the Connecticut Climate Change Action Plan, this increase would cover programs to reduce the amount of waste being put into landfills and/or waste-to-energy facilities, thereby reducing the amount of generated methane and carbon dioxide, and emissions associated with producing products using virgin materials. By diverting MSW from disposal, a reduction in the amount of greenhouse gas emissions is anticipated to occur. These reductions would contribute to the overall State effort to achieve regional goals set by the New England Governors/Eastern Canadian Premiers and the Connecticut General Assembly to address climate change. The Connecticut Climate Change Action Plan and related information can be accessed through www.ctclimatechange.com

Current Recycling and Composting Practices

This section provides a synopsis of Connecticut's recycling and composting practices. A more detailed summary is provided in Appendix D.

Connecticut has a mature recycling program in place. This program was developed in response to recycling mandates and was accompanied by comprehensive programs for recycling education and recycling technical assistance and outreach. State funding was awarded to the municipalities and recycling regions for the development of the State's recycling infrastructure and for recycling education. In the early 1990s, the State awarded nearly \$40 million in grants to municipalities to support the State's recycling program. As a result of this significant investment of time, money, and effort, approximately 30 percent of Connecticut's MSW is estimated recycled or composted.

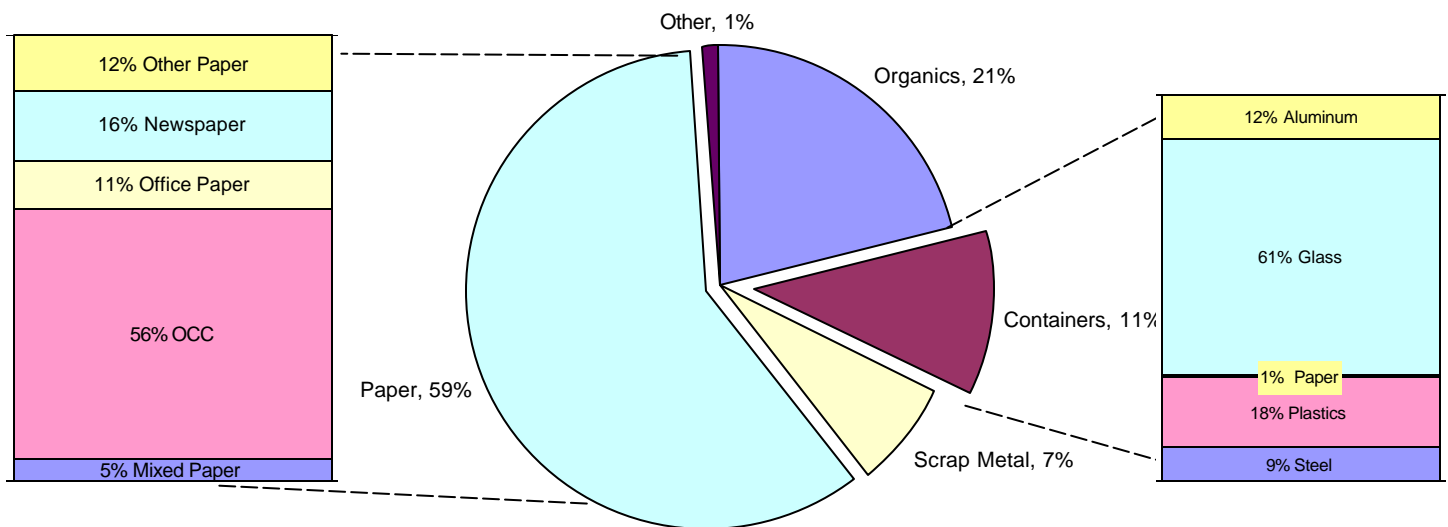
Figure 4-1 provides a breakdown of the MSW materials recycled and composted in Connecticut in FY2003. As shown in the figure, the greatest percentage of recycled materials consists of paper (cardboard, newspaper, mixed paper, office paper, and other types of paper), followed by organics (leaves, yard waste), scrap metal, containers (glass, plastic, steel, paper, and aluminum), and a small amount of other items (e.g. used oil, textiles, antifreeze, computers, etc.)

MOVING TOWARDS CONNECTICUT'S VISION: OBJECTIVES AND STRATEGIES

The recycling funding which was awarded to kick-start the regional and municipal recycling programs is now exhausted. At the present time, Connecticut finds itself with a largely stagnant recycling and composting rate which suffers from a chronic lack of resources and which has some critical gaps in service and infrastructure.

Connecticut processing capacity for the currently mandated recyclables appears to be sufficient for the near term. However, there will be additional capacity needed for some of the materials targeted by this Plan such as commercial and institutional source separated organic matter, electronics, and recyclables recovered from C&D waste. A comprehensive waste characterization study of disposal would help to document the future need for additional recycling processing capacity as Connecticut makes progress toward meeting its waste diversion target of 58 percent.

Figure 4-1
Estimates of Connecticut MSW Diverted from Disposal (FY2003)



Source: Solid Waste and Recycling Reports Submitted to CT DEP and estimates of additional recycling tonnages by R. W. Beck based on Franklin Associate reports for CRRRA.

Recycling and Composting Mandates

Connecticut's recycling laws require separation of state mandated recyclables by everyone who generates them (including residents, businesses, institutions, and government); prohibits haulers from knowingly mixing the separated mandated recyclables with other solid waste; and requires municipalities to make provision for separation, collection, processing and marketing of designated recyclables. The State designated list of recyclables includes:

- corrugated cardboard;
- glass food containers;
- metal food containers;
- newspaper;
- high grade white office paper (non-residential only);
- scrap metal;
- lead-acid storage batteries (also has a deposit system and disposal ban);
- crankcase used oil from engines;
- Ni-Cd rechargeable batteries;
- leaves; and
- grass clippings (disposal ban).

Many regional and municipal programs recycle additional materials such as mixed paper generated by residents, magazines, PET (#1) and HDPE (#2) plastic bottles, and yard waste. There is a bottle bill law in Connecticut that recovers additional beverage containers from the waste stream.

The enforcement of these laws is a joint effort shared by municipalities, haulers, disposal facilities and the CT DEP. The following are examples of some mandated recycling responsibilities:

- **Municipalities**

Responsibility for solid waste management has historically been a function of municipalities. Since the early 1970s, municipalities have been required to make provision for the safe and sanitary disposal of all solid wastes generated within their borders (CGS Section 22a-220). In the mid-1980s, legislation was passed which required each municipality to make provisions (on or after January 1, 1991) for the separation, collection, processing, and marketing of designated recyclables generated within their boundaries (CGS Section 22a-220(f)). Subsections of CGS Section 22a-220 also mandate a goal for municipalities to recycle and/or source reduce their waste by 40 percent and required municipalities to adopt a recycling ordinance, designate a municipal recycling contact, and submit an annual recycling report to CT DEP, and authorize CT DEP to issue orders against municipalities not in compliance with these requirements. Municipalities have statutory authority to establish fines for violations of their recycling ordinance.

- **Generators**

All generators of solid waste, including residents, businesses, institutions, and government, are required under Section 22a-241b to separate or provide for separation of designated recyclables.

■ **Haulers**

Examples of mandated recycling requirements for haulers include: requirement to register in the municipalities in which they operate; requirement to help municipalities enforce the municipal recycling ordinance. Collectors are required to notify the municipal recycling contact about any customer believed to be discarding designated recyclables with solid waste. Upon request of the municipality, a hauler is required to provide a warning notice to customers suspected of violating separation requirements. Haulers shall also assist the municipality in identifying persons responsible for creating solid waste loads containing significant amounts of recyclables which were detected by the receiving resource recovery or solid waste facility.); and a prohibition against knowingly mixing solid waste with separated recyclables. Haulers are subject to a civil penalty up to \$2,500 for each violation and up to \$10,000 for a subsequent violation of this prohibition.

■ **Solid Waste Facilities**

CGS Section 22a-220c(b) requires the owner or operator of each resources recovery facility or other solid waste transfer or disposal facility who observes significant quantities of designated recyclables in the loads received at their facility to provide prompt notification to the driver of the vehicle delivering the load and to the recycling contact of the municipality from which the load originated. The owner or operator of each such facility is also required to conduct periodic unannounced inspections of loads delivered to the resources recovery facility or solid waste facility to assist municipalities and the commissioner in accurately assessing compliance with recycling requirements. Such owners or operators are also required to conduct additional inspections upon the request of the commissioner. Facility owners or operators of resource recovery facilities and landfills who fail to comply with these requirements are subject to civil penalties of \$500 to \$5,000 for each occurrence of a violation.

■ **CT DEP**

CT DEP has statutory and regulatory authorities to enforce state recycling statutes and regulations. The CT DEP can seek penalties and may issue an order or take legal action under Chapters 439 and 446c of the CGS. The CT DEP undertakes site investigations of all solid waste facilities and responds to complaints.

In actual practice, the system of recycling enforcement has been problematic because:

- Many municipalities are not enforcing their recycling ordinance;
- Many haulers are not enforcing or promoting recycling and some are mixing separated recyclables with trash;
- Some solid waste disposal or transfer facility owners or operators are not inspecting loads for significant amounts of recyclables and even for those that are conducting the inspections, many are not effectively following-up on such loads to assure that the problem is being followed up and corrected by the municipality or the generator; and

- The CT DEP does not have civil penalty regulations specific to some types of recycling violations.

Recycling and Composting Outreach Programs

Making everyone aware of his or her role in recycling is critical for the system to function at its optimum. What can and should be recycled and how to do so requires outreach that delivers consistent, repetitive messages that are audience appropriate. Focusing on our youth pays off both in the present, as they teach their parents, and the future. Recycling outreach programs implemented in Connecticut since 1991 include:

- Recycling Education Centers located at the Groton, Hartford, and Stratford Intermediate Processing Facilities (IPCs) are highly effective in teaching students and teachers about source reduction and recycling. *Status:* On-going.
- America Recycles Day is a national all-volunteer non-profit organization that holds an annual national awareness event to promote social, environmental, and economic benefits of buying recycled and recycling. *Status:* CT DEP efforts greatly curtailed, Connecticut Recyclers Coalition (CRC) has taken on some of the responsibilities of the annual event.
- Connecticut Business Environmental Council (CBEC): Originally called the Connecticut Business Recycling Council, it consisted of businesses helping other businesses set-up recycling programs. The CT DEP funded the Council's start-up and first few years of operation. *Status:* CBEC still exists, but no longer receives CT DEP funding. Although not as active as in earlier years, CBEC is currently contracted by the Tunxis Recycling Operating Committee (TROC) to follow-up with businesses that send loads with significant amount of recyclables to the Bristol Resource Recovery Facility for disposal to help those businesses set-up effective recycling programs.
- Recycling conferences, workshops, presentations, videos, fact sheets, table top exhibits, poster contests, and manuals for businesses, schools, municipalities, institutions, hospitals, colleges and universities, state agencies, etc. *Status:* Direct outreach curtailed; materials still exist but are dated.
- Ray Cycle was the very successful recycling superhero in the CT DEP recycling educational program for schools. *Status:* Discontinued due to funding.
- Statewide multi-media campaign consisted of radio, television, printed materials, and bus billboards. *Status:* One time effort at start up of the State recycling program in 1990s.

Recycling Collection and Processing

Most homes and businesses have access to recycling services, and the recycling collection and processing infrastructure is in place for mandated recyclable materials. Collected recyclables flow either directly from the point of generation or through transfer stations to destinations in Connecticut or out-of-state for processing and recycling. Destinations include recycling processing facilities, scrap metal dealers, composting sites, used oil processing facilities, and end users such as paper mills.

MOVING TOWARDS CONNECTICUT'S VISION: OBJECTIVES AND STRATEGIES

Depending on the type, amount, and/or number of waste materials being aggregated or processed, a Connecticut solid waste management/recycling facility may either have a general permit, an individual permit, or be a registered facility. Recycling general permits were developed to be less burdensome and to simplify and facilitate the permitting process for recycling facilities that handle a relatively small amount of recyclables or only one material.

Some items such as some redeemable (bottle bill) bottles and cans, some types of batteries, and telephone directories have material specific infrastructures in place for recycling and are administered by industry groups. For example:

- It is estimated that close to 67 percent of Connecticut's carbonated beverage containers are collected through Connecticut's bottle bill infrastructure and assumed to be recycled. However, since there are no reporting requirements associated with Connecticut's bottle bill, the 67 percent rate is based on Massachusetts's bottle bill redemption rates.
- Close to 98 percent (based on national numbers) of lead acid storage batteries are recycled through a separate deposit program for these batteries.
- Rechargeable batteries (nickel-cadmium-NiCd; nickel metal hydride-NiMH; lithium ion-Li-ion; and small sealed lead-Pb) are recycled through retailers and municipal drop-off sites through a national recycling program operated and financed by the battery industry through the Rechargeable Battery Recycling Corporation ("RBRC") Call2Recycle™ Program.
- Telephone directory publishers distributing their directories in Connecticut are required to retrieve a percentage of their directories for recycling.

In the early 1990s, a system of nine regional recycling districts was formed to undertake recycling education and assist municipalities with contracting and marketing materials. Some of the State recycling grant money was awarded to the regions to develop regional recycling intermediate processing facilities (IPCs) to process paper, bottles and cans from member towns. Currently, some of those IPCs accept only residentially generated recyclables, while others accept both residential and non-residential material. Several of the recycling regions, with authority to enter into contracts on behalf of their member municipalities, executed long-term contracts for recycling with the IPCs on behalf of the towns. In many cases, the tipping fees for recyclables at the IPCs are approximately half of tipping fees for trash delivered to the resource recovery facilities (RRFs), though one IPC does provide for revenue sharing. A unique system to promote recycling by member towns was implemented by the Connecticut Resources Recovery Authority (CRRA) at its Hartford IPC and MidCT RRF and at the Stratford IPC and Bridgeport RRF. The tipping fee paid for trash delivered to the MidCT RRF and Bridgeport RRF by member towns also covers the costs of processing residential recyclables (bottles, cans, and paper) at the Hartford IPC and Stratford IPC, and for other recycling services such as one-day electronics collection days. This allows for no tip fee for residential recyclables delivered by member towns to the Hartford and Stratford IPCs. This system provides a strong

MOVING TOWARDS CONNECTICUT'S VISION: OBJECTIVES AND STRATEGIES

incentive for member towns to reduce the amount of trash they dispose of and increase the amount of material they recycle.

Though some of the regional recycling programs are currently inactive or have reduced their recycling involvement, some are still actively working to promote recycling. The following are some examples:

- In August 2005, CRRA announced a partnership to expand the CRRA Hartford IPC. The expansion of the facility will greatly increase the types of materials that will be recycled and the capacity and efficiency of the operation and will provide a tonnage payment to CRRA, plus a revenue-sharing arrangement.
- In 2006, the Tunxis Recycling Operating Committee (TROC) completed a market research study that identified factors influencing recycling among its residents and identified areas where key improvements need to be made to increase recycling participation.
- In 2006, Housatonic Resources Recovery Authority (HRRRA) announced the expansion and improvement of their website and recycling assistance for member towns.
- In 2006, the Southeastern Connecticut Regional Resource Recovery Authority (SCRRA) announced that all member town transfer stations will accept electronics for recycling from residents and announced a regional composting bin distribution program.

These examples demonstrate the potential of the regional recycling system in Connecticut to provide the foundation for enhancing regional cooperation to support and promote recycling.

Practically speaking, all residents have access to either curbside or drop-off recycling services, and in many instances it is provided through the municipality. Although commercial recycling services are generally handled by the private sector, some municipalities provide for recycling pick-up and/or provide options for drop-off of recyclables for the businesses located in their city or town. Due to economies of scale, larger businesses tend to have recycling programs in place and, depending on the type of business, some recycle material in addition to those mandated by state law, if quantities and markets for those additional materials make it economically feasible. However, in general, there is a lack of programs that efficiently and cost effectively collect recyclables from small businesses. The reasons for this are varied, but small business recycling programs generally do not realize the benefits of economies of scale of the large business recycling programs. This lack of economic incentives for small businesses to recycle under the current trash hauling infrastructure coupled with inadequate enforcement of recycling requirements has resulted in limited recycling participation by small businesses.

Current Organics Recycling and Composting Practices

Composting in Connecticut spans a variety of feedstocks, but the most prevalent organic material currently being composted is leaves. As of March 2006, ninety-four leaf composting facilities were registered with the CT DEP. Twenty-one of these are

MOVING TOWARDS CONNECTICUT'S VISION: OBJECTIVES AND STRATEGIES

privately owned and/or operated and the remainder are municipally operated. Thirteen of those are currently inactive. Combined, the active sites have a processing capacity of approximately 666,000 cubic yards of leaves per year. Residents, landscapers, and municipal public works and highway departments use compost produced by these facilities as a soil amendment or mulch. CT DOT has used compost on highway projects and in wetland creation.

Farms can play an integral part in the state's composting effort through sheet leaf composting, the application and incorporation of leaves on cropland actively devoted to agricultural production. In 2005, four farms notified the CT DEP that they planned to accept leaves for sheet leaf composting, with a combined capacity to compost approximately 16,440 cubic yards of leaves. In addition, 26 farms (4 inactive) have agricultural waste management plans approved by the CT DEP for composting such materials as horse manure, animal bedding, leaves, soiled non-recyclable paper, vegetable waste, hay, slaughterhouse waste, fish mortalities, and dead poultry. Combined, the active farm sites have the capacity to process approximately 33,478 cubic yards per year of organic material.

In Connecticut a small number of institutional food scrap composting efforts are underway. The CT Department of Corrections (CT DOC) Prison Complex in Enfield has composted food scraps from the prison sculleries for nine years at a rate of 2000 pounds per day. Working cooperatively, the CT DOT provides wood chips as a bulking agent in exchange for the use of adjacent CT DOC property as a staging area for wood cleared during highway maintenance. This program results in a 50 percent savings on dumpster costs, creates a compost product used on prison grounds and provides jobs and job training for soon to be released inmates.

At a local level, there are several elementary schools that have cafeteria food scrap composting bins on school grounds. Southeast Elementary School in the Town of Mansfield was the model used in the development of the School Composting Manual funded by the CT DEP. Some colleges and universities compost manures, yard trimmings, and/or food scraps on-site. Unique composting efforts are being pursued by others and include activities being undertaken by Foodshare that grinds spoiled produce into slurry and delivers it to an organic farm for composting and the City of Middletown which is establishing a vermi-composting (worm composting) project for local commercial and institutional generators. Others in this category include one-day zero waste events where food scraps and bio-based dishware is composted with leaves, animal mortality composting on farms, and the CT DEP's own on-site office food scrap composting program.

The permitting of composting activities varies depending on the type of feedstock, volume, location, and processing technology. Facilities composting only leaves are exempted from solid waste permitting provided they register with the CT DEP. Sheet leaf composting on agricultural land is also exempt and practitioners need only notify the CT DEP. The addition of grass clippings to leaf sites can be approved through the issuance of a general permit registration. On-site composting of source separated organics, such as institutional, school, or home composting, is not regulated as long as the processing capacity falls under one ton/hour pursuant to CGS Section 22a-207(5).

MOVING TOWARDS CONNECTICUT'S VISION: OBJECTIVES AND STRATEGIES

On-farm composting is allowed under the agricultural waste management plans approved by the CT DEP. The CT DEP, through the NPDES permit process, regulates sewage sludge (also commonly referred to as bio-solids) composting at two publicly owned wastewater treatment facilities currently operating sludge compost facilities, one in Farmington and the other in Fairfield. Source separated organics recycling facilities taking materials from many different off-site sources and processing or receiving that material at a rate greater than one ton/hour are required to obtain a solid waste volume reduction facility individual permit. Depending on the circumstances, water discharge or storm water management permits may be required at any facility.

The Department has determined that mixed MSW composting, using current technologies, is not an acceptable means of solid waste management for Connecticut because of concerns about facility operations, odors, and the quality and marketability of the compost product. Technologies for mixed MSW composting involve collecting mixed municipal solid waste from which recyclables have not been source separated, processing the waste to remove some recyclables and unwanted inorganic materials, and composting the remaining waste. In 1996, the Connecticut General Assembly amended CGS Section 22a-228(b) to eliminate composting of mixed MSW from the solid waste management hierarchy. In all permitting and technical assistance efforts, the Department has required that composting facilities accept only source separated organic materials that will result in a high quality compost.

Current Efforts to Support Recycling and Composting Markets

Recycling programs can only succeed when the material collected for recycling is used to make products which are competitive in quality and price and which have market demand. Demand for recycled materials is enhanced when government encourages or requires the use of recycled material in products that meet high quality standards. Actions taken in Connecticut to increase demand for recycled materials include:

- A statutory requirement for newsprint users to collectively use a minimum percentage of recycled newsprint fiber (CGS Sections 22a-256m through 22a-256u). This requirement and similar efforts in other states resulted in expanded North American mill capacity to de-ink and use recycled newsprint.
- A statutory requirement for directory publishers to use a minimum percentage of recycled content directory paper.
- Promotion of EPP by state agencies and municipalities through the CT DAS. A series of state statutes have been adopted to facilitate and increase the purchase of recycled content products by Connecticut State agencies and municipalities. These include (but are not limited to):
 - CGS Section 4a-59 (c): Award of contracts (allows 10 percent price preference for recycled content products).
 - CGS Section 4a-67a: Plan to increase State purchase of goods containing recyclable materials and goods capable of being recycled or remanufactured.
 - CGS Section 4a-67e: Standards for purchase of recycled paper.

MOVING TOWARDS CONNECTICUT'S VISION: OBJECTIVES AND STRATEGIES

- CGS Section 4a-67f: Specifications for printing and writing paper (minimum 30 percent post-consumer content).
- CGS Section 4a-67g: Recycling and remanufacturing of laser printer toner cartridges.
- CGS Section 4a-67h: Procedures promoting the procurement and use of recycled products and environmentally preferable products and services by state agencies.
- The regional promotion of market development through support of work with organizations such as the Northeast Recycling Council (NERC). The CT DEP has worked with the NERC on a range of market development efforts at the regional level. In the late 1990's, NERC helped develop the Recycling Investment Forum as a strategy to stimulate the development of businesses processing or manufacturing products from recycled materials.
- CT DEP has conducted workshops, presentations and other outreach efforts to encourage state agencies, municipalities, businesses and others to boost purchases of recycled content products.
- The CT DEP includes "buy recycled" messages in most recycling outreach materials.
- CT DEP collaborated on a research project with CT DOT and the Connecticut Transportation Institute at the University of Connecticut. This research demonstrated that compost was effective in controlling soil erosion, growing turf, and amending soil used in planting roadside trees and shrubs. As a result of the research, CT DOT now has a materials specification and a construction detail that allows the substitution of compost for peat in planting backfill.
- The Town of Glastonbury produces a better quality compost from the leaves they compost at their municipal composting site and starting in May 2006 were able to charge for the higher-quality compost rather than give it away for free.

Barriers to Increasing Recycling and Composting

The following are the key barriers that hamper growth in recycling/composting in Connecticut:

- A chronic lack of ongoing funding at the local, regional and state levels. The level of funding, staffing and other resources allocated to recycling and composting has not been adequately maintained.
- Failure to comply with state and local recycling and composting laws.
- Failure of municipalities and the State to enforce recycling requirements.
- While the State has a program to collect and analyze data to calculate statewide and individual municipal MSW disposal, recycling, and generation rates, the reported data is not always complete or accurate, especially for individual municipalities. In addition, there are no resources to collect or use data to assess the need or success of specific programs.

MOVING TOWARDS CONNECTICUT'S VISION: OBJECTIVES AND STRATEGIES

- Low public awareness and concern over waste management and recycling and no incentives to reduce waste generated and disposed resulting in low recycling participation rates in some municipalities.
- A permitting process widely perceived among private-sector firms as inhibiting the development of certain recycling or composting facilities due to overly costly, lengthy and uncertain procedures.
- Issues directly affecting the viability of markets for some material currently collected for recycling include the following: concerns over the declining quality of some material collected for recycling; a lack of market demand for some materials (affecting the economics of collecting and processing this material); insufficient recyclables collected to meet market demand (affecting the viability of both the recycling processors and the manufacturers that depend on those recycled materials as a feedstock); and continually changing packaging designs, some of which may pose problems for current recycling systems. Specific examples of some of the market issues negatively impacting recycling include:
 - Currently, there are poor to non-existent domestic container markets and limited other markets for green glass;
 - Currently, market demand for some plastic resins and paper exceeds the amount of these materials collected and processed for recycling.
 - When changing packaging designs, manufacturers do not always take recyclability into account and, as a result, some new packaging designs may potentially pose problems for existing recycling systems. For example: layers and barrier coats, adhesives, labels, closures, etc. added to plastic bottles can impact the recyclability of the bottle; the rapid introduction and use of radio frequency identification devices (RFIDs) for tracking and inventory control in all types of products and packaging, may potentially impact the recyclability of the packaging.
- Lack of incentives for recycling businesses or processors to locate in Connecticut. Recycling processors and manufacturers have varying financing needs, depending on their product, their market and their particular strengths and weaknesses. Financing can be the key to allowing companies with challenging needs to grow, such as those with new, unproven products or those entering newly emerging markets for which traditional investors may have strong reservations due to perceived risk. However, there are a lack of programs specifically designed to help recycling businesses and end users to site or expand new facilities.
- Lack of program models that can be implemented in Connecticut to efficiently and cost effectively collect recyclables from small businesses. Although economies of scale generally make recycling cost effective for large businesses, the same is not true for small businesses and, as a result, many of Connecticut's small businesses are not recycling. The reasons for limited recycling by small businesses are varied, but the major issues appear to be a lack of economic incentives for small businesses to recycle under the current trash hauling infrastructure and inadequate enforcement of recycling requirements.

- Barriers specific to recycling/composting source separated industrial, commercial, and institutional organics, such as food scraps, soiled paper and waxed corrugated cardboard can include:
 - Difficulty in siting facilities based on local zoning issues and permitting requirements;
 - State regulatory requirements and fees which do not encourage the development of facilities to process those materials; and
 - A lack of knowledge by the generators of organic materials about the opportunities and benefits of composting.

Recycling and Composting Opportunities and Priorities

Through the combined efforts at source reduction, recycling, and composting, Connecticut proposes to take aggressive actions toward achieving a diversion from its disposal rate sufficient to eliminate the projected in-state disposal capacity shortfall by FY2024. That would equate to diverting 3,035,000 tons from disposal and achieving a 58 percent MSW diversion from disposal rate by FY2024. Nearly doubling the current disposal diversion rate will be a very difficult goal to achieve, even over the twenty-year planning period. To achieve this rate, even gradually over time, the State needs to implement a variety of strategies to increase the quantity and quality of recovered materials and to build resilient, highly efficient and continually improving programs. Listed below are the higher priorities for increasing recycling and composting in Connecticut.

- Enhance Connecticut's Beverage Container Deposit Law.
- Strengthen enforcement of the State's existing mandatory recycling system.
- Establish incentives for generators, municipalities, haulers and manufacturers to divert more MSW from disposal.
- Increase efforts to educate Connecticut's consumers regarding the problems associated with increased waste generation, and the steps that they can take to reduce the amount of waste they generate, reuse materials and products as much as possible, and recycle those waste materials that can't be reused.
- Provide sufficient funding to municipalities, regional recycling entities, and state agencies to implement the recycling and composting strategies in the Plan
- Streamline the recycling facility permitting process.
- Identify national innovative waste diversion programs and develop models that may prove successful to Connecticut.
- Strengthen regional coordination and cooperation.
- Build capacity for market development services and providing incentives for recycling processing businesses and businesses using recycled material.

- Increase the recycling and composting of organic wastes, especially source separated food residuals, generated by the institutional/commercial/industrial sector.

Recycling and Composting Strategies

Connecticut will expand recycling and composting by pursuing strategies listed below in this Objective, as well as pursuing strategies listed under the education, permitting and enforcement, and funding objectives as found later in this Chapter. Since organics recycling or composting has great potential to decrease disposal rates in Connecticut, a set of strategies specific to achieving increases in the amount of organics composted and recycled is listed separately under this Objective.

Strategies to Increase Recycling

Strategy 2-1. Update Connecticut's beverage container deposit system by increasing the deposit amount and expanding coverage to at least plastic water bottles.

The beverage container deposit law should be changed to: allow for an increase of the deposit amount from 5 cents to 10 cents to provide a stronger price incentive for recovery of deposit containers; add plastic water bottles to the type of containers that would require a deposit; and increase, as appropriate, the fee that goes to retailers and redemption centers to cover their handling costs.

Strategy 2-2. Add plastics PET #1 and HDPE #2 and magazines to the list of State mandated recyclables.

Many of Connecticut's recycling facilities process and market magazines and plastic bottles (PET #1 and HDPE #2) and many towns collect those recyclables. The markets for these types of recyclables are good. Yet, these types of plastics and magazines are not listed as State designated mandatory recyclables. The potential exists to recover and recycle more of those items in Connecticut. Plastic containers and plastic products are becoming a larger percent of the waste stream by volume and by weight. EPA estimates that plastic packaging increased from 0.1 percent of the MSW stream (by weight) in 1960 to 5 percent (by weight) in 2003. The American Plastics Council estimates that 96 percent of all plastic bottles produced are either PET #1 or HDPE #2. Despite the increased amounts of plastic used in packaging and the readily available markets for some resins, there is not enough material being recovered to meet the demand for this material by manufacturers who want to use it to make new products. Connecticut needs to do a better job of recovering PET and HDPE plastic resins, especially for those plastic containers generated away from home. Therefore, the State will add PET #1 and HDPE #2 plastic bottles to the list of mandatory recyclables. Also, there are established markets for magazines recovered from the waste stream and Connecticut has the infrastructure in place to collect and process this type of material as well. The State will add magazines to the list of mandatory recyclables. For municipalities not currently collecting PET #1, HDPE #2 and magazines for recycling, funding to help pay for changes in the collection infrastructure may be needed if additional costs are incurred as a result of these new

mandates. That is, if savings from removing these materials from the waste disposal collection infrastructure do not cover increased expenses related to collecting these materials for recycling.

Strategy 2-3. Continue to support Environmentally Preferable Purchasing (EPP) at CT DAS and promote and ensure State agencies and political subdivision utilization of EPP standards. CT DEP and CT DAS will evaluate the relevant statutes to ensure their completeness and effectiveness in actual State purchasing practices.

EPP involves using criteria related to source reduction, recycling and other environmental concerns to guide purchasing decisions. EPP programs have been adopted by U.S. EPA, as well as Connecticut and several other states and communities. The EPP program at CT DAS needs to be supported and promoted to enhance the effectiveness of the program in ensuring EPP, including the purchase of recycled content products by state and local governments.

Strategy 2-4. Through the Agency's Solid Waste Management Advisory Committee, identify incentives for municipalities and haulers to implement effective and voluntary PAYT pricing systems for managing solid waste from residents and small businesses to achieve waste reduction.

PAYT programs, also known as unit pricing or variable-rate pricing, are structured so that residents and sometimes small businesses as well, are charged for trash collection and disposal based on the amount they throw away. Usually under PAYT residents and participating small businesses are not charged a recycling fee. This creates a direct economic incentive to recycle more and to generate less waste. When structured effectively and when implemented with good education and associated source reduction and recycling programs, PAYT has been documented repeatedly to be an extremely effective incentive for waste reduction. National studies indicate that when PAYT is implemented for the residential sector, waste disposal drops an average of 17 percent. The disposal decrease is achieved through source reduction, increased recycling and better home composting and grasscycling. Since Connecticut already has a recycling mandate, the decrease in disposal may not be as high as that indicated by national studies, but it would still be significant. In Massachusetts, where recycling is mandatory as well, communities with PAYT have an average recycling rate of 44 percent; this is 13 percent higher than the average recycling rate for municipalities without unit-based pricing programs. The decrease in MSW disposal achieved by PAYT could be even higher if small businesses also followed the PAYT paradigm for MSW disposal. In Connecticut, some haulers providing automated trash pick-up have offered a form of PAYT by offering different size trash containers at different prices. However, it needs to be determined whether there is sufficient choice of container size and the difference in charges between the different size containers is great enough to provide an incentive to dispose less.

Since PAYT may be perceived as just another tax, it can be a challenge to convince residents that PAYT really is the most effective and equitable way to pay for solid

MOVING TOWARDS CONNECTICUT'S VISION: OBJECTIVES AND STRATEGIES

waste management. Therefore, public officials are often reluctant to implement PAYT even when convinced that PAYT is the best system for managing their town's solid waste. However, numerous national studies have indicated that once a PAYT program is established, most residents embrace it and support it and don't want to go back to traditional trash pricing. There are over 6,000 towns nationwide that have adopted PAYT pricing.

Due in part to the issues listed above, only eleven Connecticut municipalities have implemented PAYT, in spite of efforts by the CT DEP to promote PAYT through workshops, focus groups, development and distribution of PAYT implementation manuals, meetings with individual town officials and governing boards, and incentives such as grants for start-up costs and free consulting services. The CT DEP needs to work with the Agency Solid Waste Management Advisory Committee to identify effective incentives for local governments and haulers to adopt PAYT pricing systems.

Strategy 2-5. Increase technical assistance, education, outreach, and enforcement with regard to the business and industry sectors (especially the small businesses) and institutions to decrease their waste disposal rates by increasing recycling and source reduction. Promote EPP, including recycled content products, by Connecticut's businesses, industries, and institutions.

Greater efforts on education and outreach, technical assistance, and enforcement need to be focused within the business and industry sector and institutions to improve their source reduction activities and recycling participation rates. The purchase of environmentally preferable products, which includes recycled content products, by businesses and institutions also needs to be promoted.

- Many small businesses in Connecticut can do more with regard to recycling. The CT DEP will work with the small business sector, regional waste authorities, Chambers of Commerce, the custodial industry, municipalities, waste haulers, and the Connecticut Business Environmental Council (CBEC) to identify recycling programs that will provide convenient, cost effective recycling collection models for small businesses, and will promote the implementation of such programs statewide. There will also be targeted enforcement against small businesses not complying with recycling requirements.

With the exception of restaurants, the solid waste generated by most small businesses consists mostly of high-grade office paper and corrugated cardboard. The CT DEP will focus on the following actions to increase the existence and effectiveness of small business recycling programs throughout the state:

- Support funding for the Connecticut Business Environmental Council (CBEC) or similar organizations to design and identify effective new strategies for small businesses to increase recycling and composting. CBEC currently conducts waste reviews, and works with businesses to increase recycling awareness, encourage waste reduction, improve compliance with recycling requirements, and promote the purchase of products containing recycled content.

MOVING TOWARDS CONNECTICUT'S VISION: OBJECTIVES AND STRATEGIES

- Provide increased education and technical assistance on recycling by working through regional business organizations, trade groups, chambers of commerce, and custodial companies.
- Promote participation in national programs to assist with source reduction and recycling (e.g., EPA's Waste Wise Program).
- Develop a public recognition program for successful small business recycling efforts.
- Some commercial building management companies may not be providing recycling programs for the tenants in their buildings. The CT DEP, in partnership with associations such as the Building Owners and Managers Association, municipalities, regional recycling entities, CRRRA, waste haulers, and CBEC, will reach out to this sector to provide recycling education and technical assistance and ultimately enforcement against those failing to implement recycling programs in the buildings they manage.
- Larger businesses and institutions have the potential to reduce the amount of disposed waste and lower their disposal costs as well through hauler contracts that incorporate incentives for less disposal. The CT DEP will explore options and work with both sectors and, if determined appropriate, introduce this type of contracting and promote its use.
- The CT DEP will target a "buy recycled" campaign toward Connecticut businesses and institutions through the promotion of programs such as the National Recycling Council's "Buy Recycled Business Alliance".
- Other efforts that will be undertaken by the CT DEP will include: increased education and technical assistance, publicizing successful business recycling efforts, promoting national programs to assist with source reduction and recycling, and increasing enforcement of recycling requirements through targeted inspections.

Strategy 2-6. Continue the CT DEP's Municipal Recycling Honor Roll Awards Program and the Green Circle Awards Program to recognize and support exemplary source reduction and recycling practices and promote technology transfer.

Award programs can help to provide public recognition for exemplary source reduction and recycling efforts being undertaken to promote the environmental agenda of the State. These types of programs also provide a venue for sharing and promoting technology transfer. Two such programs are the CT DEP's Municipal Recycling Honor Roll and the Green Circle Awards. CT DEP will continue to use and profile these programs as a tool to boost awareness of source reduction, recycling and composting activities being undertaken within the state.

Strategy 2-7. CT DEP, in collaboration with regional authorities and the hauling industry, will identify incentives for haulers to increase the amount of material recovered for recycled.

CT DEP and regional recycling authorities will provide on-going assistance to waste collectors in providing recycling education for their customers. The current system for motivating generators and haulers to assure that mandated recyclables are being recovered is not effective. CT DEP will work with the hauling industry to identify and promote more effective incentives for recovering more recyclables from the waste stream and will identify and implement more effective disincentives for failing to do so.

Strategy 2-8. Develop the infrastructure necessary to increase the amount of paper that is recycled. Create incentives and funding for increased paper recycling and for source reducing the amount of waste paper generated.

Markets for paper collected for recycling have improved significantly and have remained relatively stable in recent years (as compared to the historic volatility of these markets) and are expected to remain stable. This favorable climate should enable Connecticut to create programs, incentives and infrastructure to divert significant additional amounts and types of paper from the waste disposal stream.

To take advantage of these circumstances the State will:

- Encourage regional Intermediate Processing Centers and other recycling facilities to follow the lead of CRRA and some private sector facilities and explore the feasibility of developing the necessary infrastructure to recycle additional amounts and types of paper; and
- Encourage municipalities, businesses (especially small businesses and businesses in multi-tenant commercial buildings), and haulers to collect and recycle additional amounts and types of paper with established recycling markets, including high-grade white office paper from the residential sectors and other types of paper such as chip board (for example cereal boxes), discarded mail, paper beverage cartons. More high-grade paper is being generated at home due to the proliferation of home computers, while recycling of other types of paper is dependent on the availability of stable markets.

The State will work with paper processors, paper mills, and paper industry associations and will provide technical assistance to large generators of waste paper to help reduce the amount of waste paper generated and maximize the amount recycled.

All State agencies will be required to take steps to ensure that all mandated paper types are recycled and will be encouraged to explore options for increasing the types and quantities of paper collected and recycled.

Strategy 2-9. Support the continued recycling of non-mandated recyclables.

The markets and recycling infrastructure already exist in some parts of Connecticut for various MSW items that are not required to be recycled. Therefore, recycling programs should be supported and, if feasible, expanded for items such as anti-freeze, latex paints, textiles, residential high-grade paper, residential mixed paper, and paper beverage containers such as milk and juice cartons. Recycling programs for plastic bottles and magazines should be supported as well until such time they are added to

the state's mandated recycling list. As markets and infrastructure become available, CT DEP will promote the recycling of other items including certain types of carpeting, ceiling tiles, etc. The CT DEP encourages pilot projects, when determined necessary, to test the feasibility of recycling some of these materials. In an effort to facilitate recycling of non-mandated materials, CT DEP will assess and amend its beneficial use program to eliminate requirements which do not protect the state's environment but which present barriers to increased reuse or recycling.

Strategy 2-10. CT DEP, the Agency's Solid Waste Management Advisory Committee and other State Agencies will work with recycling business representatives to facilitate the development, expansion, and creation of markets for recycled materials.

Establish a subcommittee of the Agency's Solid Waste Management Advisory Committee to identify ways to assist processors, end-users and reuse companies to overcome market barriers and increase value-added beneficial use of recovered materials and to help provide up-to-date information on market trends. High priority market sectors will initially include C&D waste, food waste and other organics, and electronics. Consideration should be given to identify changes that will eliminate any disincentives and create incentives that will foster recycling and reuse for these materials.

Strategy 2-11. Build local, regional, and state capacity for implementing State recycling policies, regional planning and program implementation, and recycling information sharing.

- Funding needs to be provided for municipal and/or regional recycling coordinators to promote, assist, and enforce recycling in the municipalities. The success of Connecticut's recycling program is contingent upon efforts by each municipality, whether through its own recycling coordinator, or through a recycling coordinator shared by a group of towns, or through a regional recycling coordinator to:
 - Ensure that municipal residents, businesses, and organizers of special events are aware of and carry-out the recycling requirements pursuant to local recycling ordinances and mandates;
 - Promote recycling through educational outreach and incentives and technical assistance; and
 - Share information among municipalities and regions.
- Recycling and composting programs need to evolve over time to keep up with changes in markets, waste composition, more effective and efficient technologies for collection and processing of recyclables, and acquired experience in the field. It is a challenge for local program managers to stay current with changing best practices and to identify how to adapt them to their community's needs. To address this need, technical and financial assistance programs must target both local governments and, where appropriate, regional entities. The type of technical assistance to be provided will include assistance with local system optimization, especially development of contractual agreements and pricing systems that provide

strong incentives for waste diversion, and evaluating opportunities to improve local system effectiveness and efficiency. The technical assistance program will require close coordination with all providers of education and outreach and other related strategies to reinforce the State's desire to move towards more-consistent, effective programs over time.

- To further assist and encourage local and regional programs to improve performance, the Department will seek funding to re-establish a program of innovation grants to municipalities and recycling regions. Such grants could be used to further innovative approaches that serve the State's overall objectives of reducing solid waste disposal. A portion of the funding can be reserved for top-priority waste reduction efforts as determined by the CT DEP on an annual basis.
- CGS Section 32-1e was modified by Public Act 06-27 to require the Connecticut Department of Economic and Community Development (DECD) in consultation with the CRRA and the CT DEP to develop a plan by July 1, 2007 for the support and promotion of industries that use, process, or transport recycled materials. The plan is required to outline ways existing programs of the DECD, the CRRA, and agencies such as the CT DEP, the Connecticut Development Authority and Connecticut Innovations, Incorporated will be used to promote such industries.

Strategy 2-12. CT DEP and regional recycling entities will work to build partnerships with groups that can assist with and support the State's recycling efforts. Potential partners include regional recycling programs, municipalities, CRRA, trade associations, businesses, non-governmental organizations, universities and others.

Strategy 2-13. CT DEP will designate a "State Source Reduction and Recycling Coordinator" to coordinate and implement the strategies described in this section and other sections of the Plan to increase source reduction, recycling, and composting.

Strategies for Organics Recycling and Composting

Strategy 2-14. Identify the internal barriers and solutions to streamlining the permitting process for source separated organic material recycling, especially for those institutional, commercial and industrial operations that process food scraps, soiled paper and waxed cardboard.

One of the most important strategies to implement successful organics recycling in Connecticut is to build processing capacity for at least an additional 100,000 tons/year of source separated organic materials, especially food scraps, soiled paper and waxed old corrugated cardboard from the industrial, commercial, and institutional sectors. Although it will likely require the siting of some large-scale facilities, this capacity should be achieved through a variety of on-site, farm, municipal and regional facilities. The State, quasi-government agencies, waste generators, organics processors, haulers and residents should share the responsibility for increasing

capacity and recycling rates for organics. Some approaches that could be undertaken include:

- Amend state permitting and regulatory requirements to encourage source separated organic material recycling. The CT DEP will prioritize and fast-track source separated organic material recycling permit applications that are consistent with the goals set forth in the State Solid Waste Management Plan.
- The CT DEP will investigate the feasibility of creating an allowance for the composting of small volumes of some types of food scraps at appropriately sited and managed existing registered leaf composting facilities.
- The CT DEP will seek to partner with the State Department of Agriculture to expand on-farm composting and create an agricultural exemption, that allows agricultural composting operations with approved agricultural waste management plans to add source separated organic material. Farms can continue to play an important role in composting a variety of waste streams that are not necessarily generated on-farm. As the amount of food scraps collected is increased, there will also be a need for facilities to process them. Manure, particularly bedded horse manure, makes a perfect bulking agent and carbon source with which to blend high nitrogenous feedstocks like food scraps. Anaerobic digestion of manures on farms can be developed and expanded to include slurry made from food residuals. There is an opportunity to prevent pollution from mismanaged manure piles and over application of manure on unsuitable soils, and also reduce the waste stream by creating well-managed farm composting facilities. Diversifying farm operations to include composting and anaerobic digestion could help agriculture become more sustainable and contribute to farming income. Compost products can be used as soil amendments and other landscaping applications.

Strategy 2-15. The Agency's Solid Waste Management Advisory Committee will be requested to discuss options that could stimulate organics recycling, especially food scraps, soiled paper, and waxed cardboard from the institutional, commercial and industrial sectors.

Among the options that should be considered are the following:

- Conduct a technology workshop to share information and identify opportunities in developing organics recycling in the state.
- Identifying groups of commercial and institutional generators that generate the most food waste and have the best opportunity to cost-effectively divert food waste from disposal. Such generators would include supermarkets, hospitals and other health care facilities, hotels and convention centers, colleges and universities, and state institutions such as prisons.
- Seek statutory authority to create appropriate economic incentives to attract the siting of large-scale source separated organic material processors to Connecticut.

- Seek federal monies from agriculture and energy agencies that may be available for start-ups, as well as potential state funding that may be available from the Connecticut Clean Energy Fund.
- Identify and seek funding for related research for large-scale organics recycling/composting facilities; of particular interest are anaerobic and aerobic digestion technologies that can handle food waste.

Strategy 2–16. Include compost and compostable materials in a statewide or regional on-line materials exchange to link generators of source separated organic material with processors and compost users.

Create a statewide or support the expansion of regional on-line materials exchange to include a compost component. The exchange can include a data base of compost generators, processors, and end users and can provide information on the type of organic material according to moisture content and carbon:nitrogen ratio to facilitate the recycling, marketing, and use of the source separated organic material.

Strategy 2-17. Encourage the marketing of compost products for such uses as erosion control, potting soil blends, topsoil blends, playing field mediums, etc.

The CT DEP will continue to work with regional organizations and other State agencies to establish State procurement specifications for compost products (e.g., topsoil, mulch) and standards for the use of these products by State agencies, municipalities, and other political subdivisions. The CT DOT has already developed specifications that allow for the substitution of compost for peat in planting soil backfill. The CT DEP will continue to promote large-scale demonstrations of the use of compost products.

Strategy 2-18. Promote home composting and grasscycling.

Seek funding to re-establish a home compost bin grant program whereby municipalities and non-profits can provide residents with low-cost bins. Promote available technical assistance to residents to encourage composting of food scraps and yard trimmings on-site via brochures, videos, and website. Convert CT DEP's home composting and grasscycling videos to more current CD technology.

4.3.3 Objective 3 - Management of Solid Waste Requiring Disposal

Assure that: the need for new disposal capacity is minimized; existing solid waste facilities are used as efficiently as possible; the public is fully aware of the potential need for and impacts of disposal options; the public is able to participate meaningfully in any application process; and the availability of sufficient appropriate and environmentally sound long-term disposal capacity for Connecticut solid waste requiring disposal, consistent with the state mandated hierarchy for managing solid waste.

Overview of Solid Waste Disposal

Even as Connecticut moves toward maximizing the amount of waste that is source reduced, recycled and composted, there will continue to be a need to dispose of the remaining waste in an efficient, equitable, and environmentally protective manner. This section will discuss the portion of the MSW, RRF ash residue, and C&D waste/oversized MSW waste streams that must be disposed. Since the late 1980s, Connecticut has developed a strong in-state infrastructure for managing the municipal solid waste that is generated. However, the situation today finds this infrastructure lacking. In-state disposal capacity shortfalls exist for both the MSW and C&D waste/oversized MSW waste streams. These shortfalls for MSW and C&D waste/oversized MSW are projected to increase if existing trends of increased generation continue unabated through the year FY2024. Of the two ash residue landfills located in the state, CRRA's Mid CT facility is expected to close in October 2008, while the privately owned Putnam facility is expected to close in FY 2018.

Connecticut relies heavily on the six MSW resources recovery facilities for the safe disposal of the state's municipal solid waste that is not recycled. Over the next ten years, four of the facilities may shift from public to private ownership. On a regional and national level, the private waste management sector has consolidated, and has constructed several large-scale solid waste landfills in other states that provide significant disposal capacity for MSW, RRF ash residue and C&D waste/oversized MSW.

Projections for the period FY2005 through FY2024 indicate the following:

- The projections for the disposal needs of MSW and RRF ash residue are based on the state achieving a 58 percent disposal diversion rate by the year FY2024. If Connecticut does not achieve a 58 percent disposal diversion rate but maintains the current 30 percent disposal diversion rate, the in-state MSW disposal capacity shortfall amount would total 1,454,000 tons by the year FY2024.
- The projections for RRF ash residue indicate that in-state capacity exists until FY2018.
- For C&D waste/oversized MSW, the currently reported seven percent diversion rate, combined with the limited in-state disposal capacity, results in an estimated in-state disposal capacity shortfall of approximately 940,000 tons for FY2005. If the disposal diversion rate stays constant, the projection for in-state disposal capacity shortfall for C&D waste/oversized MSW is 1,436,000 tons by the year FY2024. It is recognized that much more needs to be done to increase diversion of this type of waste from the disposal stream.

Over the past few years, a steadily increasing amount of Connecticut's solid waste has been disposed of at out-of-state facilities, mostly landfills. This can be attributed to a number of factors, including the increasing MSW generation rate, the stagnant MSW recycling rate, the lack of sufficient in-state disposal capacity for MSW and C&D waste/oversized MSW, and the lack of significant C&D source reduction or recycling. The degree to which this shortfall can continue to be managed at out-of-state disposal

facilities is based on the availability and reliability of the out-of-state disposal options and acceptability of the associated environmental and economic issues.

It is impossible to predict with certainty whether reasonably priced out-of-state options will remain available into the future. At the present time, despite the shortfall that exists, reliable and economically competitive options exist for disposal of all MSW generated in Connecticut. While it is good public policy to manage Connecticut's waste within its own borders, we do not control all the market forces that influence the development and location of new waste management facilities. Therefore, absent a mandate to create additional state sponsored waste management infrastructure, the Department must continue to monitor the disposal capacity situation and advise decision makers of any significant changes to the overall solid waste management system that create greater uncertainty or increased risk.

Another consideration is flow control. In its May 1994 decision in *C&A Carbone v. Town of Clarkstown*, the U.S. Supreme Court invalidated the flow control ordinance of a New York town. It found the ordinance unconstitutional because it violated the Commerce Clause of the U.S. Constitution. Subsequent to this ruling, the U.S. Second Circuit Court of Appeals determined that the Commerce Clause does not bar regulation of solid waste management that involves more direct governmental participation and management, (*United Haulers Assoc. v. Oneida-Herkimer Solid Waste Management Authority*). The U.S. Sixth Circuit Court of Appeals disagreed with this finding. The U.S. Supreme Court has agreed to review the Second Circuit Court of Appeals ruling and it will be considered in January 2007. The CT DEP will be closely monitoring the outcome.

Current Management of Connecticut Solid Waste Requiring Disposal

This section provides a brief synopsis of Connecticut's waste disposal system and needs, while disposal issues, costs and environmental considerations are described in detail in Appendices F, G and I respectively.

MSW Disposal Management System

Connecticut's MSW disposal system has changed significantly since the mid-1980s when most MSW was landfilled in-state. In FY2004, solid waste facility reports submitted to the CT DEP indicated that approximately 82 percent of the MSW that needs disposal was processed at in-state RRFs. Of the remaining portion of the waste that needed disposal, a small amount was buried at in-state landfills and a small but growing amount (about 12 percent) was transported to other states for disposal. Transfer stations have become an increasingly important component of Connecticut's MSW management system. They serve as aggregation points for efficient transport of MSW to the in-state RRFs and landfills, as well as to out-of-state disposal facilities.

At the present time, there are six resources recovery facilities (RRFs) in Connecticut that process MSW. Over the five-year period consisting of FY2000 through FY2004, those RRFs burned an average of 2,209,444 tons/year. Table 4-5 lists the RRFs and provides information regarding their location, the maximum permitted design capacity, the average amount of MSW they burned per year over the five year

MOVING TOWARDS CONNECTICUT'S VISION: OBJECTIVES AND STRATEGIES

period FY2000 through FY2004, the year when bonds will be paid off, the number of towns contracted with each facility, the 2005 tipping fees, the ash disposal sites, and the post contract ownership. RRFs provide contractual MSW disposal for approximately 140 out of the 169 municipalities in the state. The disposal capacity for all but one facility is substantially utilized under long-term contractual waste delivery commitments. All six facilities have at least 20 years of remaining useful life assuming normal maintenance and on-going upgrading of environmental control technologies.

During the development of the Proposed State Solid Waste Management Plan, information obtained concerning the Wallingford RRF suggested the likelihood that it would cease operations once post contract energy revenues decline in FY2009. During the Public Hearing Process considering the Proposed Plan, testimony was submitted by Covanta Energy, the owner/operator of the Wallingford RRF that indicated that it was prepared to continue to operate the facility should CRRA not elect to purchase the facility at the end of the contract term. In this Plan, the projections for MSW in-state capacity and shortfalls are based on the premise that the Wallingford RRF will remain in operation through FY2024. However, Appendix J does provide as part of the identification of future disposal options and needs, both scenarios and presents the Wallingford RRF as either operational post contract or as ceasing operations in FY2009 and that the capacity it currently provides will no longer be available. Of the six MSW RRFs, all but Lisbon and Bristol facilities are part of the CRRA system. Individual community contracts with the facilities all expire between 2008 and 2020.

There are presently two Connecticut landfills permitted to accept MSW. CRRA operates the Hartford landfill and uses it primarily for process residue, and other wastes that cannot be processed at the Mid- CT RRF. The Hartford landfill was expected to reach its permitted capacity in June of 2006 but CRRA submitted a revised closure plan to the CT DEP for consideration and approval; as of late 2006, the revised plan is under technical review by the CT DEP and the landfill continues to process residue. The other landfill permitted to accept MSW is the Windsor-Bloomfield Sanitary Landfill owned by the Town of Windsor, which is projected to reach permitted capacity and close in 2007.

With minimal MSW landfill capacity, and essentially fixed RRF capacity, out-of-state disposal facilities serve as the only additional option for MSW requiring disposal at this time.

RRF Ash Residue

Connecticut's six MSW RRFs generate ash residue from combustion and must dispose of this waste in specially designed lined landfills. RRF ash residue is currently disposed at two RRF ash landfills in Connecticut: the CRRA Hartford Landfill, which accepts ash residue from the Mid-CT RRF. And the Wheelabrator-owned Putnam Ash Landfill, which receives most of the Connecticut RRF ash residue. The Bristol RRF is under contract to send its ash residue to the Seneca Meadows Landfill in New York through June 2008. The ash residue landfill in Hartford is expected to reach capacity in October 2008, leaving the Putnam facility as the only operating site in the state.

MOVING TOWARDS CONNECTICUT'S VISION: OBJECTIVES AND STRATEGIES

Based on the assumption that no new in-state RRF capacity will be built, it is projected that the Putnam site will have capacity until FY2018.

C&D Waste/Oversized MSW

Oversized MSW is generally managed with C&D waste. Connecticut has very limited landfill disposal capacity for C&D waste/oversized MSW. Although data reported to the CT DEP regarding this waste stream is incomplete, FY2004 data reported by Connecticut C&D volume reduction facilities, landfills, RRF's and transfer stations indicates that 911,303 tons or 81 percent was transported out of state for disposal. Just less than 12 percent of this waste stream was buried in CT landfills, and less than one percent was burned at CT RRFs. Connecticut Volume Reduction Facilities (VRF) currently recycle a relatively small portion of the waste they receive for processing; the majority of the waste undergoes grinding or other processing and is disposed at landfills.

Connecticut needs to substantially increase recovery of C&D waste/oversized MSW in the coming years, as well as to pursue other options for in-state disposal. However, because data regarding solid waste being delivered to in-state VRFs, transfer stations, and landfills is reported as *mixed C&D* waste or as *bulky waste* and is not broken down by waste streams, i.e. construction waste, demolition waste, wood waste, or oversized MSW, it is difficult to estimate the portion of each that can potentially be recovered. It is therefore also difficult to estimate with accuracy the amount of C&D waste disposal capacity that will be required throughout the planning period.

**MOVING TOWARDS CONNECTICUT'S VISION:
OBJECTIVES AND STRATEGIES**

**Table 4-5
MSW RRFs in Connecticut**

Selected information	Bridgeport RRF	Bristol RRF	Mid-CT RRF	Southeast RRF	Wallingford RRF	Lisbon RRF
Maximum Permitted Design Capacity (tons/year) ⁽¹⁾	821,250	237,250	888,888	251,485	153,300	195,640 ⁽²⁾
Average Amount (tons) of MSW Burned/Year ⁽³⁾	722,692	196,113	715,011	250,484	143,158	181,987
Year Bonds will be Paid Off	2008	2014	2012	2015	2009	2020
Operator	Wheelabrator	Covanta	MDC/ Covanta	Covanta	Covanta	Wheelabrator
Number of Towns Contracted ⁽⁴⁾	19 (Towns contracted to CRRRA: CRRRA has contract with Wheelabrator)	14	70	16	5	5 + 11 ⁽⁴⁾
2005 Member Tipping Fee ⁽⁵⁾	\$69	\$66	\$70	\$60	\$57	\$60-\$66
Ash Disposal Site	Putnam	Seneca Meadows (NY)	Hartford	Putnam	Putnam	Putnam
Post-Contract Ownership	Wheelabrator	Covanta	CRRRA	Covanta	Covanta	Eastern CT Resource Recovery Authority (ECRRRA)
<p>(1) This represents the maximum (theoretical) amount of waste the facility is permitted to process per day multiplied by the number of days a year the facility operates. Facilities usually do not operate at this level due to efficiency variations and to repairs, maintenance, and other down time.</p> <p>(2) As appropriate, 13,140 tons/year are dedicated only for processed demolition wood (based on the Lisbon RRF permit to operate).</p> <p>(3) The Average Amount of waste burned per year is based on the five-year period of FY2000 – FY2004.</p> <p>(4) A total of 129 CT municipalities of 169 are currently under contract for MSW disposal at one of the six in-state MSW RRFs plus eleven Housatonic Resources Recovery Authority (HRRRA) communities, which have a contract with Wheelabrator to dispose of their MSW at a Wheelabrator disposal facility. Currently most of this HRRRA waste is delivered to the Lisbon facility, however it is not contracted specifically to that facility.</p> <p>(5) Tipping fees cover a range of activities, from disposal only to transfer, recycling education, recyclables processing, and electronics recycling activities.</p>						

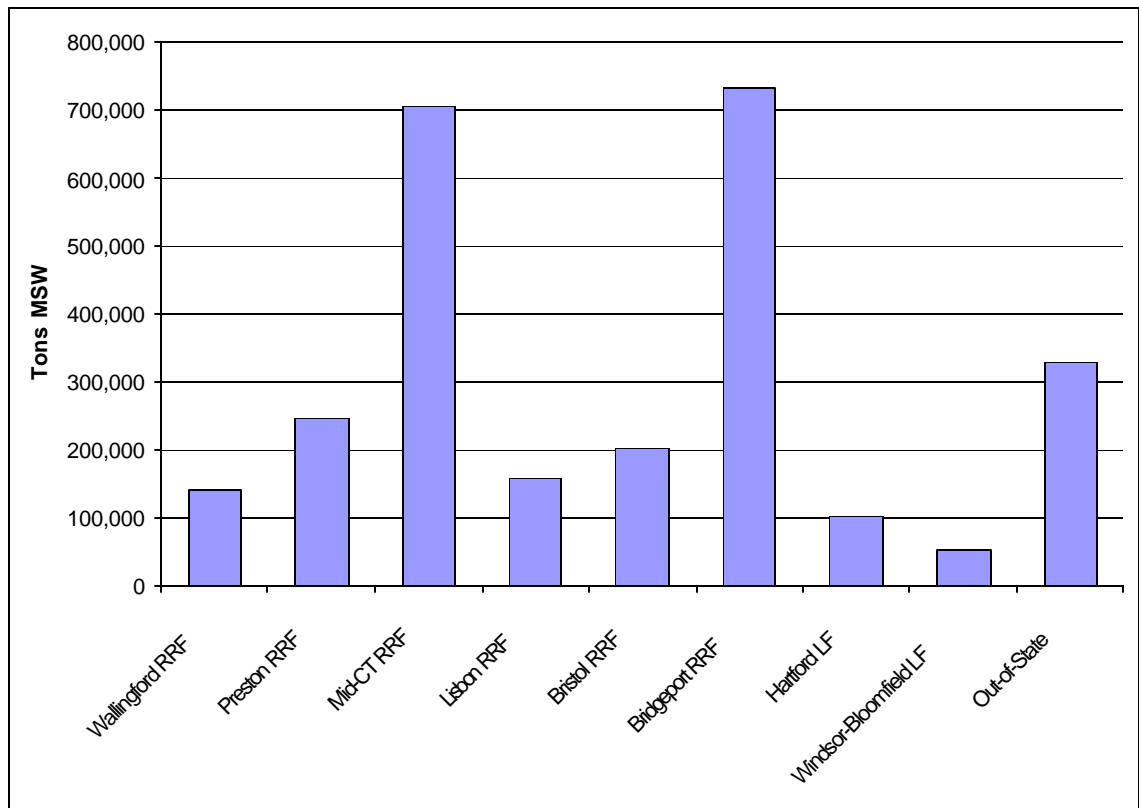
Waste disposal practices in Connecticut for FY2004 are presented in the following figures.

- **Figure 4-2** shows the disposal of Connecticut-generated MSW at in-state RRFs and landfills and out-of-state disposal facilities. The Hartford landfill includes oversized MSW.
- **Figure 4-3** shows the disposal of ash residue generated by the in-state RRFs and the waste directed to either in-state or out-of-state ash residue landfills.
- **Figure 4-4** shows the disposal of C&D waste/oversized MSW, either directly disposed or directed through in-state transfer stations and volume reduction

MOVING TOWARDS CONNECTICUT'S VISION: OBJECTIVES AND STRATEGIES

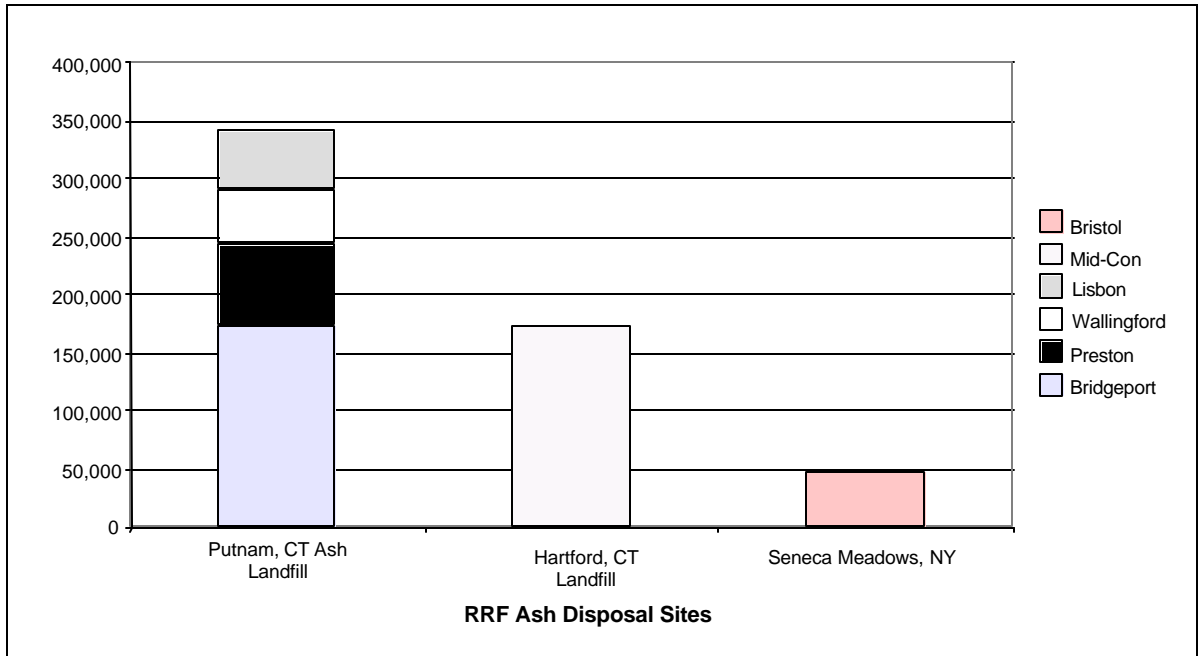
facilities to in-state landfills or RRFs, and to out-of-state disposal facilities (mostly landfills).

Figure 4-2
Disposal of Connecticut-Generated MSW Based on CT Solid Waste Facility Reports
FY 2004

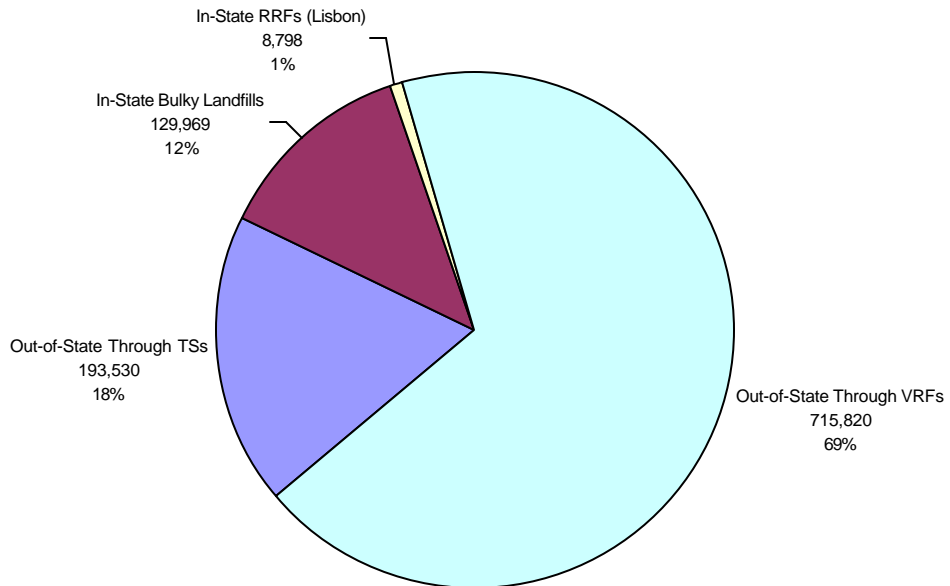


MOVING TOWARDS CONNECTICUT'S VISION: OBJECTIVES AND STRATEGIES

**Figure 4-3
Disposal of Ash Residue Generated by Connecticut RRFs FY 2004**



**Figure 4-4
Disposal of C&D Waste and Oversized MSW FY 2004 (Based on CT Solid Waste Facility Reports)**



Barriers and Issues to Solid Waste Disposal

There are a number of social, economic and environmental barriers and issues related to disposal of solid waste, both in-state and out-of-state. Some of these are listed below:

In-state Disposal

- Local opposition to new and/or expanded solid waste disposal facilities due to perceived and real burdens associated with construction and operation; e.g., traffic, noise, groundwater pollution and odors.
- The public perception that combustion of MSW is hazardous to public health and the environment.
- Environmental impacts associated with disposal options consisting of RRF, landfilling, use of in-state transfer stations for transfer and transport of wastes to out-of-state landfills and of other waste management operation.
- Limited numbers of sites that would meet Connecticut's environmental siting requirements for a new disposal facility.
- Disposal contracts at the resources recovery facilities will be expiring in a few years, leaving the future uncertain in terms of waste delivery and tip fee revenues to the RRFs. Municipalities may choose to deliver their waste elsewhere (potentially out-of-state), or to have no long-term contract and shop for the best deal.
- Inadequate data, in particular pertaining to C&D waste/oversized MSW, on which defensible projections of diversion and/or recycling can be based.
- Lengthy and costly permitting requirements.
- Uncertainty in the electricity marketplace, which makes up a significant source of RRF revenue.

Out-of-State Disposal

- Cost and availability uncertainty.
- Environmental Impacts associated with disposal options.
- Environmental and cost impacts of transport.
- Social acceptability for managing Connecticut's waste elsewhere (out-of-state).
- State environmental regulatory enforcement and permitting of disposal facilities in other states may not be as stringent as in Connecticut.

Opportunities, Priorities and Strategies for Disposal

MSW

The data show that the amount of MSW generated in the state exceeds the capacity of disposal facilities in the state. This MSW in-state capacity shortfall for FY2005 was

MOVING TOWARDS CONNECTICUT'S VISION: OBJECTIVES AND STRATEGIES

estimated at approximately 327,000 tons per year, representing 12 percent of the total Connecticut MSW disposed.

In order to eliminate the projected MSW in-state capacity shortfall by FY2024, Connecticut will need to achieve a 58 percent disposal diversion rate by that time period. Failure to achieve this rate will result in increasingly larger amounts of MSW that will need to be disposed of by RRF, opening new landfills or shipping it out-of-state to solid waste facilities. If no steps are taken to improve the state's MSW rate of diversion from disposal and if Connecticut maintains its current disposal diversion rate of 30 percent, then by FY2024, the shortfall will represent 40 percent of the amount of MSW disposed.

The degree to which this shortfall presents a problem depends on the availability, reliability, potential for environmental harm, costs, and environmental justice issues of the disposal options available and ultimately used by Connecticut MSW generators. The responsibility of the State of Connecticut is to assess these issues and take prudent steps to ensure that capacity exists for the safe and reliable disposal of Connecticut generated MSW. In meeting this obligation, the State needs to consider several factors including the following:

- Problems that could result from not having available, reliable and economically competitive disposal options, regardless of location, including the cost and availability of out of state disposal options.
- Environmental, cost, and societal impacts resulting from the construction and operation of resource recovery facilities and landfills.
- The Determination of Need requirements of Section 22a-208d of the General Statutes, which say that the DEP can approve applications for new or expanded resource recovery or ash residue capacity only if such *facilities ...are necessary to meet the solid waste disposal needs of the state and will not result in substantial excess disposal capacity...*
- Consistency of any proposed new capacity with this Plan, as required by Section 22a-229 of the General Statutes.
- The long-term viability of existing and planned disposal capacity.
- New technologies, methods or programs that may be available for disposal, recycling, reuse or other steps that can be taken to safely dispose of waste or reduce the amount of waste requiring disposal.

Other important factors must be considered in evaluating these issues. In looking at the development of new in-state MSW disposal capacity, it would be appropriate to consider the cost and environmental efficiencies associated with expansion of existing RRFs compared to developing totally new sites where it may be environmentally preferable and less costly to expand. In some cases, synergies may be developed by expanding capacity utilizing technologies that complement existing facilities.

These factors must be weighed against the added social costs of expansion. Bridgeport and Hartford RRFs are located in urban areas where environmental justice

issues are of significant concern. Therefore, it will be critical for any application for expanded capacity in these areas to be fully discussed, debated and understood by the public.

In summary, additional MSW disposal capacity in Connecticut must only be developed in a way that:

- Does not impede efforts to maximize source reduction, recycling and composting (for example, efforts to maximize disposal diversion are impeded by committing waste to disposal through long-term contracts with put-or-pay clauses);
- Involves local communities and considers issues of environmental justice;
- Minimizes environmental harm associated with transportation and disposal practices over time;
- Minimizes economic costs of site development, ongoing transportation and disposal tip fees; and
- Is based on objective, scientific information used to evaluate options.

RRF Ash Residue

When RRF ash residue disposal capacity is no longer available at the Hartford landfill (expected to occur by October 2008), the only available in-state disposal capacity for ash will be at the privately owned Putnam landfill, which is expected to reach capacity by FY2018. Because of the lengthy and controversial application process that can be expected, it would be important for applications for ash disposal capacity to be submitted with a sufficient lead-time.

Construction and Demolition Waste/Oversized MSW

The projected generation of this waste and the limited management options at the current time should be a motivating factor for both the public and private sector to seek a better way to deal with this material. There is limited recycling of this waste material and at the present time, limited opportunities to increase recycling due to the infrastructure in place and lack of end markets. There is a significant in-state capacity disposal shortfall for this waste and it is projected to keep increasing. While the State will increase efforts to maximize the amount of C&D waste/oversized MSW diverted from disposal, there will still be a significant amount that will require disposal. Currently, the disposal options are mostly out-of-state, with very limited and decreasing in-state options. This situation presents opportunities for the development of new in-state disposal capacity that will not hamper the efforts to maximize disposal diversion. The CT DEP will prioritize permit applications that address the current C&D waste/oversized MSW in-state disposal capacity needs. The Plan makes no recommendation for a change to the State's criteria for siting C&D waste/oversized MSW landfills but recognizes that this may be an issue that could be addressed by the Agency's Solid Waste Management Advisory Committee and further public discussion.

Strategies for Disposing of Solid Waste

Connecticut will pursue the following strategies to achieve its disposal capacity objectives.

Strategy 3-1. Minimize the need for additional capacity for disposal of MSW, MSW RRF ash residue and C&D waste through aggressive implementation of the source reduction, recycling, composting, and other initiatives in this Plan. This Plan establishes a target of achieving a 58 percent MSW disposal diversion rate by FY2024.

One of the most important means of ensuring that adequate capacity exists to handle the solid waste generated in Connecticut in the future is to make sure that the existing capacity is utilized as efficiently as possible, and that the need for new disposal capacity is kept to an absolute minimum. In order to do so, the State must make maximum efforts to achieve the aggressive diversion target rate of this Plan. In support of the 58 percent MSW disposal diversion rate, the Department will:

- Conduct a waste characterization study;
- Continue to monitor the State's disposal diversion rates and conduct a comprehensive analysis of the disposal diversion rate at the mid-point of this planning period, by the year 2016, for the purpose of assessing success and recalibrating future efforts; and
- Encourage and promote research, consider and evaluate new technologies, and assess and eliminate institutional barriers in order to establish such activities in-state.

Strategy 3-2. The State will monitor solid waste generation and capacity on a regular basis, and with input from the Agency's Solid Waste Advisory Committee, evaluate the need for additional MSW, MSW RRF ash residue, and C&D waste disposal capacity.

The State will first maximize the efforts described in this Plan to reduce the amount of waste generated or needing disposal, in order to avoid, as much as possible, the need for new MSW disposal facilities in Connecticut. At the same time, the State recognizes that a growing in-state disposal capacity shortfall exists for C&D waste and must be addressed. Currently, there is existing capacity for RRF ash residue disposal. However, the Department recognizes that considerable lead time must be built into the process when considering new RRF ash residue landfill permit application(s) prior to the exhaustion of RRF ash residue capacity. It will therefore be critical for the State to monitor these issues so prudent action can be taken to ensure that adequate capacity for MSW, C&D waste and RRF ash residue is available in the future.

Strategy 3-3. The Department will seek legislative authorization to require any applicant for new RRF or landfill capacity, at the time any application is submitted to the CT DEP, to create a fund to be accessed by the host municipality to: (1) fund a local advisory committee and (2) hire appropriate expertise to assist the host municipality in reviewing the application and taking part in the

application process. The local advisory committee should include elected officials and residents from both the host community and contiguous communities.

The most significant effects from the creation and operation of new waste disposal facilities are local. However, residents and elected officials often feel that they have insufficient opportunity and expertise to properly review and comment on any application for these facilities. Therefore, following the process used by the U.S. EPA's Superfund Program, meaningful local participation in the application process should be supported financially by the permit applicant to help address this issue.

Strategy 3-4. Require C&D waste to be processed to the greatest extent practicable prior to its disposal at any solid waste facility.

Disposal capacity for C&D waste in Connecticut is very limited, and it is likely that applications for new capacity will be submitted over the next few years. In order that any such new capacity does not create a disincentive for diverting C&D waste toward recycling or reuse, the state should require C&D waste to be processed (either on-site of generation or off-site) to recover as much material as possible for reuse and recycling before the remaining waste can be disposed at a solid waste facility.

Strategy 3-5. Research and track new solid waste management technologies that have the potential to reduce environmental impacts and maximize benefits.

Solid waste processing technologies are constantly changing. For example, new gasification and other so called conversion technologies that potentially could provide a more economical and efficient means of recovering the energy value of waste are under development. Studies should be performed that evaluate new solid waste management processing technologies that have the potential to reduce environmental impacts, such as air pollution and the creation of byproducts that must be managed, and maximize benefits, such as the generation of energy and/or other beneficial products. Also, more needs to be done to evaluate the potential for the beneficial reuse of MSW ash residue.

4.3.4 Objective 4 - Management of Special Wastes and Other Types of Solid Waste

Maximize source reduction, recycling, and beneficial use of special waste and other types of solid waste in a manner that protects human health and the environment and also assure that special waste and other types of waste that require disposal are disposed in compliance with the State's solid waste management hierarchy in facilities that meet all regulatory standards for protectiveness of human health and safety, natural resources, and the environment.

Overview of Special Wastes and Other Types of Waste Management

Special waste includes a variety of wastes requiring handling different from that appropriate for MSW. In this section, certain special wastes are addressed in detail,

including C&D waste, land clearing debris, oversized MSW, and electronic wastes. Other special wastes are also addressed, but to a lesser extent and include household hazardous waste (HHW), animal mortalities, road wastes (street sweepings and catch basin cleanings), contaminated soils, dredge materials, sewage sludge, water treatment residual solids, pressure treated wood, sharps and waste pharmaceuticals, and disaster debris.

Special Waste Management: Current Practices, Barriers to Management, Opportunities and Priorities

A brief description of current practices and issues associated with some of these waste streams is provided below. The management of electronic wastes, commercial food wastes, and construction and demolition waste wastes are described in more detail in Appendix H. Not all special wastes, such as tires, are discussed or listed in this Plan. However, for most of those categories, the Department has a mechanism in place for addressing the particular category of waste, including guidance documents, policies and general permits. While those mechanisms may be in need of updating or discussion at some point, the Department can address those issues through on-going program activities, as well as future efforts including discussions with the Agency's Solid Waste Management Advisory Committee.

Construction and Demolition (C&D) Waste

Overview of C&D Waste

C&D waste is the waste stream generated as a result of activities such as construction, renovation, repair, and demolition of buildings, dams, piers, bridges, and paved surfaces such as roads, highways, and parking lots. C&D waste typically consists of larger sized material and varies widely depending on activity type. It includes asphalt, concrete, brick, soils, wood, metal, wallboard, roofing, insulation materials, plastics, cardboard, glass, packaging and miscellaneous trash. Although Connecticut categorizes and regulates construction waste as a distinct type of MSW and demolition waste as a type of "bulky waste" (a subset of "special waste"), C&D waste is discussed in this Plan as its own waste category because it is managed as a single waste type. Other wastes sometimes managed with C&D waste, including oversized MSW (bulky items such as furniture, mattresses, carpeting) and land clearing debris, are discussed later in this section. Although clean fill (asphalt, brick, concrete, etc.) is part of the waste stream generated by construction and demolition activities, the CT DEP does not regulate areas/facilities used solely for the processing and disposal of clean fill. Connecticut solid waste regulations define clean fill as natural soil, rock, brick, ceramics, concrete, and asphalt paving fragments which are virtually inert and pose neither a pollution threat to ground or surface waters nor a fire hazard. There are different categories of C&D waste based on the source and/or the management of the waste: i.e. demolition debris from buildings and other structures, construction waste from buildings and other structures, and construction and demolition waste from road and highway. Table 4-6 provides a listing of the types of waste, their respective legal classification per Connecticut statutes, and examples of that type of waste.

Connecticut must manage C&D waste in keeping with the hierarchy mandated by state statute, CGS Section 22a-228(b). Currently, most of the Connecticut C&D waste is disposed and only about 7 percent is reported recycled. These figures are only reflective of the waste which passes through Connecticut permitted solid waste facilities and is reported to the CT DEP and does not include most of the clean fill generated and reused or recycled, which are not reported to the CT DEP. The low recycling rate of what is reported is coupled with a severe lack of disposal capacity in Connecticut for C&D related waste, resulting in most of Connecticut's C&D waste being disposed of in out-of-state landfills. In FY2004, in-state C&D volume reduction facilities (VRF) and transfer stations (TS) reported sending approximately 909,000 tons of Connecticut generated C&D waste to out-of-state landfills for disposal. Projections indicate that if Connecticut doesn't reduce its amount of C&D waste requiring disposal, then by FY2024 the in-state disposal capacity shortfall for C&D waste will increase to 1,436,000 tons per year.

This Plan presents actions to increase source reduction, reuse, recycling, composting, and beneficial use of various components of the C&D waste stream as well as disposal for that waste that cannot be managed in such a manner. In many cases, not only is it environmentally preferable and consistent with the statutorily mandated hierarchy, it is also less costly to reuse, recycle, or compost some types of C&D waste than it is to dispose of them. However, not all C&D related waste can be reclaimed, and those portions will require other management options. Those other management options could include: the use of clean wood derived from C&D waste in clean or renewable energy applications, the burning of some types of processed C&D waste at Connecticut resource recovery facilities or waste-to-energy facilities, the continued export to out-of-state landfills, and disposal at newly developed in-state lined bulky waste landfills.

Current C&D waste management practices

C& D waste is generated from the following two activities:

- C&D waste from building construction, renovation, and demolition; and
- C&D waste from highway/road construction and demolition.

C&D waste from building construction, renovation, and demolition

U.S. EPA national data cited in this section is from *Characterization of Building-Related Construction and Demolition Debris in the United States, June 1998* and was prepared for U.S. EPA by Franklin Associates. EPA estimates that 136 million tons of building-related C&D debris was generated in the United States in 1996, representing about 25 percent to 30 percent of all solid waste generated. Table 4-7 provides EPA estimates that in 1996, building demolitions accounted for 48 percent of the C&D waste stream, renovations accounted for 44 percent, and construction accounted for 8 percent of the waste generated. The table also provides estimated tons generated annually in Connecticut. EPA estimated that the per capita generation rate for building-related C&D debris in 1996 was 2.8 pounds per person per day. Applying that per capita rate to Connecticut would give an estimate of 1.78 million

**MOVING TOWARDS CONNECTICUT'S VISION:
OBJECTIVES AND STRATEGIES**

Table 4-6 C&D Waste		
Activity	Legal Classification in Connecticut of Waste Produced by Activity	Examples of the Types of Waste
Building Demolition	Bulky waste, clean fill	Wood, brick, plaster, roofing materials, wallboard, metals, carpeting, insulation, ceramics, concrete, siding, asphalt.
Building Construction	MSW, clean fill	Pallets, wood scraps, brick, clean wallboard, siding and roofing scraps, packaging (such as cardboard), partially used paints and stains, scraps of new carpeting, foam padding, and insulation.
Highway construction and demolition	Bulky waste, MSW, clean fill	Asphalt, concrete, steel, related construction and demolition wastes, utility poles, railroad ties.
<p>Clean Fill is defined by Connecticut solid waste regulations as natural soil, rock, brick, ceramics, concrete, and asphalt paving fragments which are virtually inert and pose neither a pollution threat to ground or surface waters nor a fire hazard. Asphalt millings are not considered as clean fill, that is asphalt pieces that are smaller than 4 inches (millings, shavings, dust and the like). The CT DEP does not regulate areas/facilities used solely for the processing and disposal of clean fill.</p>		

tons annually of building related C&D debris generated in Connecticut, based on Connecticut estimated population for July 2003. The amount of C&D waste captured in the FY 2004 solid waste facility reporting to the CT DEP indicated an annual C&D waste generation rate of 1.1 million tons. The amount of clean fill that is generated in-state and which is not reported to the DEP would add to the Connecticut reported amounts. It needs to be noted that the amount of C&D waste generated in any year is dependent on variables such as storm activity and economic conditions, and therefore the amount generated year-to-year can be highly variable.

The composition of C&D debris also varies significantly, depending on the type of project from which it is being generated. Building related construction activities generally produce cleaner materials than building demolition activities, where waste materials might be bonded together or contaminated with hazardous materials, such as asbestos or lead paint. Waste produced by renovation projects can include both construction and demolition type wastes. Table 4-8 provides estimates of the overall percentage of materials in C&D debris generated by building related activities as determined by EPA.

**MOVING TOWARDS CONNECTICUT'S VISION:
OBJECTIVES AND STRATEGIES**

Table 4-7 Estimated Building Related C&D Debris Generation ⁽¹⁾		
Source	EPA Estimated % of C&D Waste Generated Nationally in 1996	Estimated Tons Generated Annually in CT (based on EPA per capita generation and CT population of 3,483,390 as of 7/03)
Building Related Construction	8%	142,400
Building Related Renovation (can include construction and demolition type wastes)	44%	783,200
Building Related Demolition	48%	854,400
<small>(1) Amounts of C&D waste managed on-site are unknown and may or may not be included; roadway, bridge, and land clearing debris not included.</small>		

Table 4-8 EPA Estimated Percentage of Materials in Building Related C&D Debris ⁽¹⁾	
Material Type	% of C&D Waste Generated EPA Estimates
Concrete and mixed rubble	40-50%
Wood	20-30%
Drywall	5-15%
Asphalt roofing	1-10%
Metals	1-5%
Bricks	1-5%
Plastics	1-5%
<small>(1) Source: EPA - http://www.epa.gov/epaoswer/non-hw/debris-new/basic.htm</small>	

Currently, Connecticut building related C&D waste is managed in a number of ways. It can: go directly to a landfill; be volume reduced at Connecticut C&D VRFs before being disposed at a landfill or resource recovery facility; or go to a transfer station where it is transferred to a landfill. The majority of this waste is ultimately transferred to out-of-state landfills. Very little of the building related C&D waste is recovered for recycling at C&D VRFs. Although data regarding clean fill is not generally reported to the CT DEP, it is assumed that most of the brick, concrete and mixed rubble generated as a result of demolition activity is reused or recycled at one of a dozen or so aggregate recycling facilities in the state; there are no good estimates for this

MOVING TOWARDS CONNECTICUT'S VISION: OBJECTIVES AND STRATEGIES

material that is reused. For FY2004, Connecticut C&D waste and oversized MSW managed by Connecticut permitted solid waste facilities is summarized below:

- 64 percent or 717,773 tons of C&D waste/oversized MSW was disposed at out-of-state disposal facilities after processing at Connecticut C&D VRFs;
- 17 percent or 193,530 tons of C&D waste/oversized MSW (reported as “bulky waste”) was transferred to out-of-state disposal facilities by Connecticut TSs;
- 12 percent or 140,295 tons of C&D waste/oversized MSW (reported as “bulky waste”) was disposed in Connecticut landfills and RRFs either directly from generation sites or after processing at Connecticut C&D VRFs; and
- 7 percent or 76,751 tons of C&D waste was recycled; this amount excludes clean fill but includes some material reused or recycled by the CT DOT.

The following provides more information with regard to the management of building related C&D waste:

- **Volume Reduction Facilities (VRFs):** The diminishing in-state bulky waste landfill capacity and the rising cost of transporting such waste has led to increased emphasis on the processing of C&D waste material to reduce its volume for transport and disposal. As a result, much of Connecticut’s C&D waste from building related activities is delivered to in-state VRFs, where a small amount of the C&D waste is sorted out for recycling purposes but most is reduced in volume. The ultimate fate of C&D waste processed through Connecticut VRFs includes:
 - Landfills. Most of the C&D waste that is volume reduced at permitted VRFs is sent out-of-state and disposed at out-of-state C&D landfills, most of which are unlined. Lesser amounts of the VRF processed Connecticut C&D waste are disposed at Connecticut landfills, also unlined. It is not uncommon for some VRFs (those which are also permitted to transfer MSW) to mix MSW with C&D waste before transferring the waste to disposal facilities. Such mixed waste loads may be categorized as MSW by some states, which import this waste for disposal and in those states that waste may be disposed of in lined MSW landfills. Some states are becoming increasingly concerned about the amount of waste they import and are beginning to impose requirements designed to reduce the amount of out-of-state waste buried in their landfills.
 - Resource Recovery Facilities (RRFs) and other Waste-to-Energy Facilities. A small amount of wood separated from C&D waste at in-state C&D volume reduction facilities is sent to in-state resource recovery facilities where it is burned for energy recovery. In addition, the potential to use processed C&D untreated wood waste in gasification projects to produce clean or renewable energy is being actively considered in Connecticut.
 - Recycling Facilities. Small amounts of recyclables, such as scrap metal, clean fill, and untreated wood, are recovered from mixed C&D waste received at in-state VRFs and are recycled or reused.

- **Transfer Stations:** Many transfer stations receive bulky waste (which can include construction and demolition, oversized MSW, and land clearing debris) and transfer it to bulky waste landfills, both in-state and out-of-state. These transfer stations do not process the waste and act only as aggregators of the waste.
- **Direct Haul for Disposal from Site of Generation:** Some unprocessed C&D waste generated at building construction and demolition sites is hauled directly to both in-state and/or out-of-state landfills.
- **Used Building Material Stores and other Reuse Programs:** Some materials from construction, demolition, and renovation projects are recovered for reuse. Currently there are two reconstruction centers in Connecticut that accept donations of used building materials for resale and re-use.
- **Concrete, Brick, Aggregate:** It is assumed that a high percentage of the inert concrete, brick, and aggregate generated as a result of building related construction and demolition activities is either crushed and used as clean fill on or off site or is reused in some other way.

C&D Waste from activities related to highway/road construction and demolition

A significant amount of highway construction and demolition waste, much of which consists of aggregate material, is reused or recycled. For FY2003, the CT Department of Transportation (CT DOT) reported reusing 393,984 tons of aggregate such as concrete and bituminous asphalt as clean fill, reusing 7,352 tons of wood from posts and structures, and recycling 2,547 tons of steel from rebar, sheeting, and building structures. Depending on the type of contract and which division of the CT DOT administers the contract, milled material generated by CT DOT asphalt milling projects may or may not become the property of the contractor. Either way the material is reused. If CT DOT takes ownership of the millings, it uses them in road construction applications such as in shoulders along roadways, as base materials at maintenance facilities and storage areas, for access roadways, or for other uses. Contractors do, however, acquire a major portion of the millings produced each year. C&D waste from road and highway construction that is not recovered is disposed in landfills.

Barriers to Management of Construction and Demolition Wastes

Listed below are some of the more significant barriers to properly addressing the management of C&D waste:

- **Possible toxicity of some components of the demolition waste stream.** Some components of the C&D waste stream can contain material contaminated with potentially hazardous substances such as asbestos or lead. Any management options pursued for this waste stream must take this into consideration.
- **Limited markets for waste associated with C&D activities.** In general, the State has not supported research and development of C&D waste recycling options and market development. In addition, markets have been stifled by misconceptions about building materials made with recycled content and building

MOVING TOWARDS CONNECTICUT'S VISION: OBJECTIVES AND STRATEGIES

codes and architectural/engineering specifications that have excluded the use of building materials with recycled content. Markets have historically existed for some components of C&D waste such as clean fill, clean wood, scrap metal, and cardboard, while viable markets for other components have not been readily available. However, with green building becoming increasingly popular, the private sector is developing markets in close enough proximity to Connecticut to make some recycling cost effective for materials such as dry wall and asphalt roofing shingles. In addition, there have been increased efforts recently in Connecticut to recover usable building components, such as doors, windows, cabinets, and plumbing fixtures for reuse. Existing markets for recoverable components of the C&D waste stream need to be promoted and supported, and new markets need to be identified and supported.

- **Lack of incentives to reduce waste associated with C&D activities.** Even though Connecticut's mandated solid waste management hierarchy prioritizes source reduction and recycling, there are only minimal efforts being made in Connecticut to recover C&D waste for reuse and recycling. Historically, recycling efforts in Connecticut and other states focused on the traditional MSW recyclables and not on C&D waste recycling. Funding and other resources dedicated to the promotion of C&D waste source reduction and recycling has been minimal at best. With the exception of cardboard and scrap metal, Connecticut has no other mandates or incentives for volume reduction facilities, haulers, contractors, developers, demolition companies, or other generators or handlers of C&D related waste to generate less waste and/or to recover more material for recycling or reuse. Source separation of reusable or recyclable materials at C&D waste generation sites may be perceived to be difficult due to space, cost, and logistical barriers. It is easier and more convenient to throw everything in one container, compact or grind it to reduce the volume, and send it to an out-of-state landfill for disposal. This is the current method by which much of Connecticut's C&D waste is being handled. There is generally little awareness or concern regarding the environmental costs of generating and disposing of C&D waste in this manner and no incentive to change. The State has not yet focused outreach programs to try and change these entrenched practices for dealing with C&D waste. In addition, the State's beneficial reuse policies do not appear to facilitate innovative C&D waste recovery alternatives.
- **Lack of in-state disposal capacity for C&D related waste.** There will always be components of the C&D related waste stream that cannot be source reduced or recovered for reuse, recycling, or composting, and these components will need to be disposed of or otherwise managed. Available disposal space in Connecticut for C&D waste is minimal and none of Connecticut's bulky waste landfills are lined. There has not been a new landfill sited in Connecticut in many years. This can be attributed to various factors, which can include the State's siting requirements, as well as public opposition to the siting of such a disposal facility. Some components of the C&D waste stream can contain material contaminated with potentially hazardous substances and as reuse and recycling divert some of the less hazardous material from disposal, the remaining hazardous components can

represent a greater percentage of the disposal stream. Landfills that receive this waste will need to be lined to help ensure protection of the state's environment and the public health.

- **Incomplete data regarding the amount and types of C&D wastes generated.** Planning for C&D related waste management is further complicated by the lack of complete data. Any Connecticut C&D waste which is managed on site, or is collected and hauled directly out-of- state or to an end user, without first passing through a Connecticut permitted solid waste facility, is not reported to the CT DEP. In addition, the tonnage of C&D generated waste consisting of aggregate, which is virtually inert and does not pose a pollution threat or fire hazard and is considered *clean fill*, generally is not included in reports submitted to the CT DEP by solid waste facilities.
- **State definitions.** Connecticut categories and definitions related to this type of waste are confusing, overlap, and often do not reflect current or potential management options for those wastes. The regulated community utilizes definitions of certain waste types, such as bulky waste, that differ from the definitions provided in Connecticut's General Statutes and Solid Waste Regulations and this causes unnecessary confusion and miscommunication between regulators and the regulated community.

Priorities for Managing C&D Wastes

Priorities for managing C&D waste in Connecticut include the following:

- Promote the adoption of C&D waste prevention strategies by builders, developers, architects, demolition companies, and other generators of C&D waste;
- Maximize reuse, recycling, and beneficial use of C&D waste in a manner that protects human health and the environment;
- Improve markets for products manufactured from recycling or beneficial use of C&D waste;
- Explore new renewable/clean energy technologies for recovering energy from that portion of the C&D related waste stream that cannot be source reduced, reused, or recycled;
- Maintain a C&D waste management infrastructure that meets all regulatory standards for protection of human health and safety, natural resources and the environment; and
- Use existing solid waste facilities as efficiently as possible for recovery and disposal of C&D waste.
- Develop in-state lined bulky waste landfills.

Land Clearing Debris

Land clearing debris, which includes brush and stumps, is clean wood, sometimes intermingled with soil and rocks, that is a byproduct of such activities as land clearing

for construction, landscaping, forest harvesting, storm clean-up, and maintaining corridors for roadways, transmission lines, railroad tracks, etc. Currently in Connecticut, land clearing debris is managed as follows: chipped or ground and then used for mulch or as a component in compost; milled for lumber or processed into firewood; left on site to decay; illegally buried on site; burned legally on-site pursuant to CGS Section 22a-174(f) or RCSA 22a-174-17; dumped illegally on remote sites; historically, some was chipped and sent out of state for use in boiler-fuel applications and it is unclear if this is still being practiced; very little if any is buried at in-state bulky waste landfills; and very little is burned at in-state RRFs. The potential to use land clearing wood waste in gasification projects to produce renewable/clean energy is being explored with the support of Connecticut Clean Energy Fund and by the private sector in Connecticut. Since some land clearing debris generated in Connecticut never passes through a solid waste facility, CT DEP does not get complete data on the amount generated annually nor a complete description of the management techniques used.

Oversized MSW

Oversized MSW is a waste category used by Connecticut regulators to include large or bulky components of the MSW stream such as furniture, carpeting, and mattresses. It is generally handled with C&D waste because of its large size. Current waste management practices in the state include: processing at VRFs with C&D waste and then transferred to out-of-state landfills; transfer through in-state transfer stations to landfills, both in-state and out-of-state; burned at in-state RRFs; and reused through various programs such as swap programs at municipal transfer stations, on-line waste exchanges, building material reuse centers, charitable organizations, and consignment shops. Although reuse of some types of oversized MSW (e.g. usable furniture) is a viable option, there are few opportunities to recycle other types of oversized MSW. An industry product stewardship program to recycle carpeting is beginning to develop nationally and there are some mattress recycling (dismantling) programs located in other states. However there are currently no such facilities in Connecticut. Those options need to be explored especially in the context of product stewardship with greater producer responsibility for the management of some of these products at the end of their useful lives.

Table 4-9 provides a summary of the current and recommended management of demolition and construction waste from buildings, highway construction and demolition waste, land clearing debris, and oversized MSW.

**MOVING TOWARDS CONNECTICUT'S VISION:
OBJECTIVES AND STRATEGIES**

**Table 4-9
Current and Recommended Management of Certain Wastes**

Types of Waste	Current Management	Estimated Generation (Tons per year)	Recommended Management
Demolition and construction waste (from buildings)	<p>Processed at VRFs (very little recycled, most material is volume reduced by shredding or grinding and then disposed).</p> <p>Most disposed in out-of-state landfills.</p> <p>Some disposed in Connecticut landfills or RRF's (requires special waste authorization from the CTDEP for disposal at the RRF's)</p> <p>Small amounts are reused through building reconstruction centers.</p> <p>Most inert concrete, brick, and aggregate are either crushed and used as clean fill or reused.</p>	<p>Approximately 1.1 million tons of C&D waste (includes some oversized MSW) passing through CT solid waste facilities in FY2004.</p> <p>Actual generation higher due when include unreported aggregate generated by C&D related activities and waste not passing through a CT solid waste facility.</p>	<p><u>Demolition waste:</u></p> <p>Reduce the amount of demolition waste generated by supporting programs such as building preservation.</p> <p>Maximize the amount of demolition waste, recovered for reuse or recycling through more effective processing at VRFs and/or salvage and separation at site of generation. Explore feasibility of renewable and clean energy options and resource recovery for clean demolition wood that cannot be reused.</p> <p>Waste not recycled/composted/reused should be disposed in landfills, preferably lined.</p> <hr/> <p><u>Construction Waste:</u> Focus efforts on source reduction.</p> <p>Construction waste generated should ideally be separated or salvaged at the site of generation to maximize recovery and reuse of material and the rest should be processed at VRFs which maximize material recovered for reuse or recycling and minimize contamination of materials.</p> <p>Goal is to reuse and recycle as much as possible (cardboard, metal, non-treated wood, rubble, dry wall, etc); explore options for renewable/ clean energy or burning at in-state resource recovery facilities for that portion remaining.</p> <p>Residue will require disposal at landfills, preferably lined.</p>
Highway construction and demolition waste	<p>Reuse as clean fill.</p> <p>Processed for recycling (wood waste, metal, and other).</p> <p>Disposed in BW and MSW landfills.</p>	<p>840,000 tons/year (estimate taken from proposed 1999 CT SWMP)</p>	<p>Process most for reuse or recycling. The remaining waste, if not appropriate for waste-to-energy applications, will require disposal at landfills, preferably lined.</p>
Land clearing debris	<p>Chipped for landscaping use or mulch.</p> <p>Very little disposed in CT landfills or RRF's.</p> <p>Some is buried or burned at site of generation.</p>	<p>Little or no data exists.</p>	<p>Recycle by chipping for reuse (as soil amendment, compost, bulking agent) or clean renewable energy use.</p> <p>Prohibit disposal at landfills (LFs) and eliminate open burning (except after natural disaster).</p>

**MOVING TOWARDS CONNECTICUT'S VISION:
OBJECTIVES AND STRATEGIES**

Table 4-9 Current and Recommended Management of Certain Wastes			
Types of Waste	Current Management	Estimated Generation (Tons per year)	Recommended Management
Oversized MSW	<p>Disposed at bulky waste or MSW landfills, either directly hauled from point of generation or after passing through transfer stations or VRFs.</p> <p>Small amounts, if reduced in size, are disposed at RRFs.</p> <p>Some limited reuse and recycling.</p>	131,000 tpy (estimate taken from proposed 1999 CT SWMP)	<p>Repair and reuse as much as possible (e.g., furniture).</p> <p>Dispose at RRFs (with volume reduction first, where necessary).</p>

Electronic Wastes

Electronic waste includes computers, printers, televisions, VCRs, telephones and other discarded electronic equipment. Although only a small percentage of the nation's municipal solid waste stream, it is one of the fastest growing components. Some of these products present a disposal problem not only because they are big and bulky, but because most contain hazardous materials like lead (present in the glass in TVs and computers). There are national and international efforts to require or encourage industry to redesign some of these products to reduce the use of toxic substances in their manufacture and to improve their recyclability at end of life.

Currently there is no comprehensive, cost effective mechanism to deal with this type of waste, and convenient opportunities for recycling these wastes are not broadly available to the public. Some computer manufacturers offer take-back programs, some involve a fee. In Connecticut, some collection events are held periodically by municipalities and regional resource recovery authorities (RRRA). There is usually no cost to the resident, but it is an expensive program to offer and the municipality or RRRA pays for the collection event. Not all residents have access to such programs, and event-type programs are often not convenient for residents. Some Connecticut towns collect electronics at their municipal transfer station or recycling drop-off site; most involve a fee for residents to drop-off their electronics. Because of the cost involved, the inconvenience, or lack of awareness, many residents simply stockpile obsolete computers in their homes. Large businesses generally hire computer recyclers directly or lease computers, which may include end-of-life management. Smaller businesses may have difficulty finding proper management outlets. Some electronics are still being disposed along with other MSW, thus being landfilled or processed at RRFs. The toxicity of this material and its resulting ash is a concern. Another issue has been the manner in which some U.S. recycling programs have managed the processing of these products, often dumping used electronics in developing countries where workers were exposed to hazardous materials and unsafe, unhealthy processing

conditions and where hazardous wastes from these products are dumped without health or environmental safeguards.

Over the past three years, the CT DEP has engaged in a number of stakeholder discussions on how to best manage this waste stream, both as a part of developing this Solid Waste Management Plan and through other organizations. As part of those discussions, the CT DEP has focused on: how best the burden for recycling of electronics should be borne, whether primarily by consumers, retailers, manufacturers or municipalities; identifying systems that minimize impact to the environment, and protect public health and our natural resources; and designing systems that are as cost effective as possible. In 2006, the Department introduced legislation proposing an electronics recycling program based primarily on producer responsibility. Though there was significant interest and a variety of proposals, agreement could not be reached and this legislation ultimately did not pass.

Household Hazardous Waste (HHW) – Including HHW Containing Mercury

Virtually all households have some HHW that is generally defined as a household waste that is toxic, flammable, reactive or corrosive. Common HHW includes oil-based paints, thinners, pool chemicals, pesticides, mercury thermometers, and gasoline. The preferable strategy for dealing with this waste stream is to educate consumers to generate less HHW by substituting environmentally preferable products for products that contain hazardous materials. The CT DEP Pollution Prevention Program has been working to promote the use of environmentally preferable cleaning products and other EPP products around the home. HHW that is generated should be properly managed. HHW collection programs provide an opportunity to manage these wastes in an environmentally safe manner. At the present time, Connecticut residents have the following options for disposing of their HHW: permanent HHW facilities (four are sited in-state); one-day events; and disposing of this waste along with MSW (this option is the least preferred). Although collections are available for nearly every resident, and on average over 30,000 state residents participate in a HHW collection each year, such collections generally take place between April and November, leaving the public with no environmentally preferable option for managing their HHW in the intervening months.

Conditionally Exempt Small Quantity Generators (“CESQGs”) of Hazardous Waste Using HHW Collection Infrastructure: Small businesses are frequently unaware of their responsibilities for managing hazardous wastes. Many dispose of paints, fluorescent lights, pesticides, and other harmful chemicals in their trash or by pouring them down the drain. By law, these businesses must make a determination if their wastes are hazardous and are prohibited from disposing of any hazardous wastes in this manner. Proper disposal via contracting with a licensed hazardous waste disposal facility can be expensive for a small business. Changes in the State’s hazardous waste regulations allow many small businesses, i.e. those categorized as CESQGs, to transport their hazardous waste to HHW collections. However, the towns or regional entities that have permanent HHW facilities are not required to accept these wastes from a CESQG, but they may choose to do so. The CT DEP has

prepared a fact sheet that outlines the process as to how a CESQG may be able to participate in a HHW collection program.

Waste Products Containing Mercury: Over the past ten years, the CT DEP has been aggressively working towards eliminating mercury as a public health and environmental threat. In the past, the CT DEP held special events to collect mercury-containing devices or elemental mercury. Such programs targeted schools, dental offices, medical facilities and households with events that included thermometer exchanges and thermometer collections. Currently, products that contain mercury are collected at the on-going HHW collections, as well as through producer sponsored collection programs on a product specific basis. In 2002, Connecticut adopted comprehensive mercury reduction legislation and which is codified as CGS Sections 22a-612 through 22a-625. The legislation establishes a program to eliminate non-essential uses of mercury in consumer, household and commercial products. The law covers a broad range of topics such as manufacturer's notification, specific product bans, sale restrictions, mercury-containing lamp management, labeling requirements, dental amalgam best management practices, and manufacturer's collection plans.

Other Types of Special Waste

In addition to the C&D waste, land clearing debris, oversized MSW, electronics waste, and HHW, there are other categories of special wastes that are generated in Connecticut. These include, but are not limited to, the following:

- **Animal mortalities:** Animal mortalities can be the result of road kills; daily or occasional mortalities of farm animals; catastrophic farm animal mortality; and veterinary animal mortalities. Most animal mortalities are the result of road kill and are managed by CT DOT or municipal road crews and are generally managed by dragging the animal off the road and possibly burying it. Usually road crews are instructed not to bury dead animals too close to a road, nor to bury it near a wetland. Mass burial of dead animals is not recommended and requires permits. In some states, animal mortalities are routinely composted with other organics. This does not appear to be a common practice in Connecticut. Proper management of animal mortalities in residential areas can be challenging. Large-scale animal mortalities from illness are often managed through RRFs. The animals are euthanized and disposed as special wastes for a higher tipping fee at a resources recovery facility.
- **Road wastes (street sweepings and catch basin cleanings):** Sweeping streets and cleaning catch basins to remove accumulated sediments, trash, and debris reduces the amount of pollutants entering Connecticut's watercourses and waterbodies. Connecticut stormwater permits require that municipalities regularly perform these practices to help improve the state's water quality. Street sweepings usually contain low levels of chemical compounds associated with stormwater runoff. Catch basin cleanings generally have higher levels of pollutants than street sweepings; the fine grained sediments in catch basins and other drainage structures adsorb more metals and other pollutants than is found in street sweepings. The CT DOT and municipal public works departments are responsible for managing the

MOVING TOWARDS CONNECTICUT'S VISION: OBJECTIVES AND STRATEGIES

disposal of material from road wastes generated on their respective roadways. CT DEP's document *Guidance for Municipal Management Practices for Street Sweepings and Catch Basin Cleanings* outlines best management practices (BMPs) for the use and/or disposal of this type of waste. The actual management of this waste has resulted in some cases where temporary storage sites have stockpiled this waste far in excess of the permitted amount, eventually impacting nearby water resources. In addition, some municipalities have indicated that managing this type of waste material is costly, both for analytical testing and transport of the material to approved disposal facilities.

- **Contaminated soils:** Contaminated soils are typically generated as a result of fuel and chemical spills, leaking oil tanks, industrial accidents, and improper disposal and historic industrial practices. Contaminants may include any substances that have the potential to pollute air or water. Owners of property containing contaminated soils generally retain a private contractor to clean up the site. Soil contamination varies in degree and is typically handled through one or more of the following options available to responsible parties and property owners in Connecticut for managing contaminated soils: remediate it in place, deliver it to an out-of-state facility, dispose of it at an in-state landfill, deliver it to an in-state treatment facility, or reuse it in accordance with the State's Remediation Standard Regulations and waste management regulations.
 - Under one or more programs administered by CT DEP, Responsible Parties and property owners may remediate soil by excavation or treatment in accordance with the approval of CT DEP or Licensed Environmental Professionals.
 - Responsible Parties may take excavated contaminated soils to landfills or soils reclamation facilities in neighboring states. Contractors working in areas close to bordering states often take advantage of this option. Anecdotal evidence suggests that a significant fraction of Connecticut's contaminated soils are handled in this way. However, soils moving out of state are not tracked. Other landfills accept soil to a lesser degree on a less regular basis.
 - Three landfills in Connecticut routinely accept contaminated soils, but only with a Special Waste Disposal Authorization (SWDA) from the CT DEP. Although the individual authorizations stipulate the amount that can be disposed, the DEP does not aggregate these amounts for reporting purposes. Tipping fees at Connecticut landfills with a SWDA may range from \$60.00 to \$80.00 per ton.
 - A soil remediation facility is located in Waterbury, Connecticut and charges a tipping fee of approximately \$50.00 per ton to treat petroleum contaminated soil.
 - Reuse of polluted soil on another site requires testing of the soils and approval of the Commissioner. The reuse must follow the soil reuse requirements of the State's Remediation Standards Regulations.

MOVING TOWARDS CONNECTICUT'S VISION: OBJECTIVES AND STRATEGIES

In 2006, the Department improved its permitting process by issuance of a General Permit for Contaminated Soil and/or Sediment Management (Staging and Transfer). This allows for the stockpiling of soils to facilitate the future treatment and/or beneficial use of soils and sediments. The Department is also currently developing a General Permit for Contaminated Soil and Sediment (Beneficial Use). Both General permits should greatly facilitate the management of this type of waste.

- **Dredge Materials:** Dredged materials refer to material removed from both inland and marine waters. The main challenge with inland dredged materials is associated with the management of contaminated sediment from behind the dam or navigational channels. This material must be managed in a similar way to contaminated soils. While there are many inland dredging projects taking place each year throughout the state, the potential volume of marine dredged materials is much more significant. Marine dredge materials result from dredging operations to deepen harbors and navigation channels and anchorages. There are presently four dredge material disposal sites located in Long Island Sound. In June 2005, EPA issued a final rule that concerns ocean disposal and the designation of dredged material disposal at sites known as Central and Western Long Island Sound disposal area. The final rule applies to all federal projects and/or projects greater than 25,000 cubic yards to be disposed at those two sites. This final rule requires that a regional dredged material management plan (DMMP) which includes a comprehensive study of disposal alternatives for Long Island Sound must be prepared by June 2013 by the Army Corps of Engineers, in consultation with the states of New York and Connecticut and EPA. One of the goals of the DMMP process is to evaluate alternatives to open water disposal. Before the disposal of dredged material may be authorized at either of the two sites subject to the rule, it must be determined that there are no practicable, environmentally preferable management options available. The types of alternatives that are generally considered include upland disposal (e.g., landfill), beneficial use (e.g., beach nourishment), or sediment treatment technologies that might render the material suitable for other types of uses. At this time, there is no treatment facility designed to treat dredged material with the goal of reusing the material. The implications for future disposal of this material onto upland areas are significant.
- **Sewage Sludge:** Sewage sludge, which is generated by the 111 wastewater treatment plants located in Connecticut, is managed in three ways: shipped out-of-state for management, composted at one of two composting sites in-state, or sent to one of the six sewage sludge incinerators located within Connecticut. The sludge incinerators produce ash residue that requires disposal. The amount of ash residue that is generated is only reported to the CT DEP if the disposal of that ash occurs within the state and is reported by the disposal facility receiving the ash. This makes it difficult to quantify total amounts. In FY 2004, four of the six incinerator facilities shipped the ash residue waste to out-of-state facilities. State regulations do not allow for beneficial reuse of sewage sludge ash residue. The City of Stamford and its Water Pollution Control Authority (WPCA) are working on an

MOVING TOWARDS CONNECTICUT'S VISION: OBJECTIVES AND STRATEGIES

innovative technology to reduce waste transport and disposal of its wastewater sludge and creating renewable electric power at its Wastewater Treatment Plant.

- **Water Treatment Residual Solids:** Surface water treatment plants generate dry water treatment residual solids. Disposal options for this type of waste include: landfilling; direct sewage discharge to a Publicly Owned Treatment Works (POTW); delivery of residuals to a POTW via tanker truck where they are incinerated; and composting. Connecticut water companies have indicated that disposal options for these solids are increasingly limited and costly. CGS Section 22a-209d allows public water utilities to re-use water treatment residuals provided such use conforms to best management practices described in a CT DEP approved operations plan. This section also allows public water utilities to use such solids in accordance with such plan until the commissioner issues a general permit to such company for the use of such solids pursuant to section 22a-209f (Beneficial use of solid waste. General Permit). The CT DEP has determined that large-scale soil blending operations in which the blended product would be sold to the general public would require the issuance of a beneficial use general permit. Some public water utilities have indicated their concern, raising time and cost issues involved in developing such a permit.
- **Preservative treated wood:** Preservative treated wood is wood treated with chemical preservatives to protect against moisture, rot, and insect damage. It has been widely used for many years in the construction of structures such as decks, walkways, fences, gazebos, boat docks and playground equipment. Preservatives used include: creosote; chromated copper arsenate (CCA), ammoniacal copper zinc arsenate (ACZA), ammoniacal copper quaternary compound (ACQ), copper azole (CA), sodium borates (SBX/DOT), and others. In the past, one of the most common types used was CCA treated lumber. However, it has been found that lumber treated with CCA presents the potential for arsenic to migrate from treated wood into surrounding soil over time and may also be dislodged from the wood surface upon contact with skin. Based on these findings, the U.S. EPA worked with pesticide manufacturers to voluntarily phase out, by December 31, 2003, CCA use for wood products around the home and in children's play areas.

Even though CCA wood for some applications has been voluntarily phased out of use, structures made of this material still persist. As these and other structures age and are renovated or demolished, CCA and other preservative treated wood will continue entering the waste stream. Since many wood preserving chemicals are toxic, they have the potential to present environmental or health issues when the wood is disposed. The first priority in minimizing the effects of disposal of preservative-treated wood is to dispose less of it by encouraging the continued use of the structures built from it, as long as that doesn't present an environmental or health problems, followed by promoting salvage and reuse of the material in some other structure. Preservative treated wood cannot be used as mulch or for compost because of the potential for leaching of toxic substances. Landscape and architectural design and construction specifications should minimize use of wood in locations where rot or insect infestation is likely, and should specify using environmentally preferable alternatives such as recycled plastic lumber, naturally

MOVING TOWARDS CONNECTICUT'S VISION: OBJECTIVES AND STRATEGIES

decay resistant woods from certified forests, wood treated with less toxic preservatives, or other alternative building materials such as concrete and stone where possible.

Disposal of Preservative Treated Wood: Connecticut state statute prohibits open burning of treated lumber and no Connecticut RRF accepts preservative treated wood for disposal. Currently, the majority of discarded preservative-treated lumber goes to transfer stations or volume reduction facilities and is then transported to out-of-state C&D waste landfills, typically unlined. Recently, some municipal transfer stations have refused to accept preservative-treated wood, apparently due to issues related to potential toxicity. Until better waste management options are identified, CT DEP recommends that preservative treated wood not be disposed anywhere except in a landfill that satisfies the standards for protecting groundwater found in RCRA 40 CFR 258.40. This means lined landfills. However, as described above, most of the preservative-treated wood in Connecticut's waste stream ends up in unlined landfills, mainly out-of-state, but also in Connecticut. The CT DEP needs to assess the feasibility of requiring that preservative treated wood only be disposed in lined landfills, and will keep abreast of developments regarding alternative environmentally preferable waste management options for this type of waste material.

- **Sharps and waste pharmaceuticals:** Improperly discarded needles and other sharps may expose workers handling solid waste or recyclables to accidental needle sticks and potential infection. This can occur when containers break open inside garbage trucks, when containers containing needles are mistakenly sent to recycling facilities, or when loose sharps or needles poke through plastic garbage bags. Most health care facilities have implemented safe disposal management programs for their sharps. However, convenient, low cost options for at-home users of syringes to safely dispose of their discarded needles need to be developed and publicized in Connecticut. These can include: mail-back programs, at-home needle destruction devices, drop boxes, or supervised collection sites. Another emerging issue is the disposal of waste pharmaceuticals. Discussion is beginning on the best mechanism to assure proper disposal of these materials in a manner that is both safe and environmentally sound. CT DEP will be looking to further engage stakeholders in these discussions.
- **Disaster Debris:** The CT DEP is developing a Debris Management Plan that addresses natural and man-made disasters. The purpose of the Plan is to facilitate and coordinate safe and cost effective removal, collection, recycling and disposal of debris following a disaster, to mitigate against any potential threat to the health, safety, and welfare of the impacted citizens, to expedite recovery efforts in the impacted area(s), to maximize recycling and reuse of debris, and to address any threat of significant damage to public and private property and to the environment. Natural and man-made disasters precipitate a variety of debris that includes but is not limited to such things as trees, soils and sediments, construction and demolition materials, vehicles, and personal property.

In a major or catastrophic disaster, municipalities and Connecticut state agencies will be tasked to locate staff, equipment, and funds to devote to debris removal in both the short and long term. Such activities will be reliant upon debris disposal strategies and policies developed by the CT DEP and implemented under the Governor's emergency powers if necessary. The debris management program implemented by State agencies and municipalities will be based on recycling and material separation at the point of generation and at staging/processing locations. The goal will be to maximize potential processing and recycling options. This strategy will be of highest priority, and public education together with municipal, state, and federal cooperation will be imperative to effectively carry out this mission. The Plan is to be finalized by mid-2007.

Strategies for Managing Special Waste and Other Types of Solid Waste

Strategies for C&D Waste

Strategy 4-1. The Agency's Solid Waste Management Advisory Committee will be requested to discuss and identify opportunities to source reduce, reuse, and recycle building related C&D waste.

The Advisory Committee will look for ways to: (1) support efforts and programs that reduce the amount of C&D waste generated from building related activities; (2) support efforts and programs to reuse and recycle C&D waste from building related activities; and (3) support the development of recycling markets for separated C&D waste from building related activities. Embracing principals of green building will contribute a great deal towards reducing C&D waste generated and disposed, and increasing the reuse and recycling of this material. Following are the types of efforts that the Advisory Committee should evaluate.

- Support efforts and programs that *reduce the amount of C&D waste generated* from building related activities.

Source reduction is the highest priority for solid waste management and the most environmentally preferable option. For construction projects, source reduction practices can include: the use of composite lumber; architectural design that minimizes wastes (e.g., use of framing techniques and designs that use standard size materials, and modular and prefabricated materials; centralized wood-cutting operations that can contribute to more efficient use of lumber and that can reduce lumber usage by up to 15 percent); renovation of old buildings for reuse; the reuse of salvageable contents from old buildings (e.g., doors, molding, fixtures, masonry, and steel); the minimization of packaging; and constructing buildings that are more durable and adaptable to different uses over time. Opportunities for source reduction should include:

- Partnering with design organizations like the Connecticut Chapter of the American Institute of Architects and the Connecticut Chapter of the American Society of Landscape Architects, and similar chapters for civil engineers, and interior designers, to convince designers to make a commitment to waste prevention in their work.

MOVING TOWARDS CONNECTICUT'S VISION: OBJECTIVES AND STRATEGIES

- Promotion of economic and zoning incentives to promote building preservation and reuse, thereby reducing demolition debris.
- Education and building code reform to qualify used materials for incorporation into new designs. Building codes should be reformed to rely as much as possible on clear performance objectives or standards, and not on materials standards, and then accept testing results that follow certain approved protocols.
- The use of education and incentives to promote and support reuse stores and waste exchanges, including on-line waste exchanges that provide opportunities for reuse of salvageable building materials.
- Support efforts and programs to *recycle C&D waste* from building related activities. Improved recycling of C&D waste can result from the following activities:
 - Promote through education and incentives on-site source separation and recycling of construction waste and some demolition waste for which markets are identified.
 - CT DEP will work with other State agencies to develop incentives for on-site source separation and recycling of construction waste, and those demolition wastes for which markets are identified, on large state-funded projects. In addition, this may be an appropriate venue to consider and discuss approaches and opportunities to manage this material when large scale development projects are being proposed.
 - Propose legislation that requires the development of waste management plans for large publicly funded demolition and construction projects. The CT DEP will draft model waste management plans that can be used for this purpose. The model could be written to include: (1) for demolition projects, an assessment of whether the structure contains lead or other hazardous components; (2) for construction projects, inclusion of source reduction practices written as specifications in the bid package; and (3) for all projects, on-site source separation of materials and identification of waste exchanges, recycling markets, VRFs and appropriate disposal options. The plans for building construction and demolition projects will optimize source reduction and recycling, and ensure appropriate waste disposal. Such a requirement will set an example for private development efforts, encourage development of markets for construction and demolition waste, and decrease the amount of bulky waste requiring disposal in Connecticut.
 - Develop model land use and building regulations that would optimize source separation and recycling of specific waste streams on construction and demolition projects and then work with municipalities to promote voluntary adoption of such regulations.
 - Partner with the CT Green Building Council, the US Green Building Council, the CT Construction Industries Association, and the Construction

MOVING TOWARDS CONNECTICUT'S VISION: OBJECTIVES AND STRATEGIES

Institute to provide more education to the design and construction industry regarding the inclusion of source separation of C&D waste as a sustainable building practice, and include source separation in construction specifications, clearly stating recycling goals, materials to be source-separated/recycled, and planning, reporting, and record keeping requirements.

- Explore options for requiring source separation of major items such as aggregate materials (brick, block, concrete, stone), scrap metal, treated wood, asphalt roofing shingles, etc. at demolition projects.
- Improve the effectiveness of C&D waste processing. Volume reduction facilities (VRFs) vary greatly according to the types of waste processed, processing techniques (manual versus mechanical), and the nature of the end processed material. The State needs to promote the development of new C&D VRFs in Connecticut and/or the improvement of existing C&D VRFs to more effectively sort and process construction and demolition waste in a manner that will minimize contamination of recyclable materials and maximize the quantity of materials that meet standards for reuse and/or specifications for use in recycling markets. This would include the processing of construction and demolition wood to make it suitable for use in clean energy technologies or for incineration at existing RRFs if deemed feasible and appropriate. The CT DEP will work with the appropriate state partners to develop and implement incentives (e.g., low cost loans) to encourage this type of activity. The CT DEP will give priority to permit applications for facilities that meet certain criteria, that can include but not be limited to the following:
 - Encourage source separation of construction and demolition waste prior to acceptance at VRFs as necessary to maximize recycling,
 - Sort and process construction and demolition waste in a manner that will minimize contamination of recyclable materials and maximize the quantity of reusable and marketable recyclable materials,
 - Process demolition wood to make it suitable for use in clean energy technologies or for incineration at existing RRFs if deemed feasible and appropriate,
 - Minimize the quantity of waste and processing residue requiring landfill disposal, and
 - Meet all statutory and regulatory requirements for the permitting of solid waste facilities.
- Consider banning unprocessed C&D waste from: being disposed at Connecticut disposal facilities, going to Connecticut transfer stations that are transferring C&D waste to disposal facilities, or being taken directly from point of generation to out-of-state disposal facilities.
- Encourage separation of C&D waste at municipal transfer stations by recommending amendments to CGS Section 22a-208a(d) to allow such limited

MOVING TOWARDS CONNECTICUT'S VISION: OBJECTIVES AND STRATEGIES

separation without requiring a full permit modification. Such changes could be authorized through a letter of approval, general permit, or minor permit amendment.

- Develop a pilot program with several municipalities around the state to develop a C&D debris recycling ordinance where each building and demolition permit applicant will pay a deposit based on type and size of the applicants' project, that is then refunded based on how much material is recycled or source reduced. Those companies that can verify that a designated percentage of the debris has been recycled or avoided through source reduction techniques will get a full refund.
- Propose legislation to require all new construction and demolition projects over a certain square footage to submit a C&D waste recycling plan as part of municipal planning and zoning approval applications. The CT DEP will draft a model of such a plan.
- Work with public and private entities to develop collection facilities/transfer stations for segregated gypsum wallboard from construction activities and, possibly in the future, from renovation and demolition activities. Look to leverage the work of other jurisdictions such as Massachusetts' program with Gypsum Recycle America.
- Support the development of *recycling markets* for separated C&D waste from building related activities. The following activities will support the development of recycling markets:
 - Appropriate state agencies must identify, develop, and promote markets that can economically use separated Connecticut generated C&D waste and must develop partnerships to share and disseminate that C&D waste market information among Connecticut C&D waste stakeholders. Research needs to be conducted for recycling market opportunities for difficult to recycle C&D waste materials such as plate glass, gypsum wallboard from demolition projects, and adulterated (treated) wood.
 - The CT DEP will work with the appropriate state agencies to propose legislation implementing incentives for the development or expansion of: (1) businesses that recycle C&D waste; (2) businesses that reuse C&D waste or use recycled C&D waste to make new products; and (3) technologies, including clean energy technologies, that use or reuse C&D wastes.
 - CT DEP will propose to amend the Connecticut general statutes to allow for limited temporary demonstrations of technologies to reuse or recycle C&D wastes without a permit.
 - Encourage CT DOT, municipalities, and the paving industry to adopt or amend specifications for asphalt to allow for the use of asphalt shingles in asphalt used for specific paving jobs.

MOVING TOWARDS CONNECTICUT'S VISION: OBJECTIVES AND STRATEGIES

- CT DEP will re-examine and, where necessary, amend the process for allowing for the beneficial reuse of categories of source separated and processed C&D waste to make the process more efficient and effective.
- Appropriate state agencies will examine the ability to provide for financial incentives, tax incentives, or other preferences for buying used construction materials or construction materials made of recycled material, especially for buildings certified as *green* by the LEED rating system or other recognized rating system.
- CT DEP will work with appropriate state agencies to establish additional specifications for the reuse of salvaged material, use of materials with recycled content, and beneficial use of appropriate wastes on state-funded projects.

Strategy 4-2. Revise the statutory and regulatory definitions of solid wastes and solid waste categories to more accurately reflect the character and management of these wastes.

Current solid waste definitions and categories as imposed by the Connecticut General Statutes and Regulations have become outdated and cause conflict with contemporary waste management practices. This results in confusing information regarding certain waste streams, making solid waste management, compliance, tracking, and planning difficult. The CT DEP will seek legislative and regulatory changes to address these definitional issues.

Strategy 4-3. Manage building related C&D waste that cannot be reduced, reused, recycled, or composted, in a manner that ensures protection of land, air, and water resources and the public health, in compliance with the state hierarchy for managing solid waste.

For C&D waste that requires disposal (i.e. C&D waste that cannot be source reduced, reused, recycled, or composted), the CT DEP seeks to divert such waste from disposal in landfills to use in clean energy technologies or incineration at existing RRFs, if it is deemed appropriate under the pertinent regulatory requirements. For waste that cannot be used for waste-to-energy, the CT DEP will require that all new Connecticut special waste landfills be lined. These landfills will be designated for the disposal of construction and demolition waste and other special waste. The CT DEP will consider banning C&D waste which has (1) not been separated at the site of generation to recover material for reuse or recycling or has not been processed off-site to recover recyclable and reusable material and (2) which has not been volume reduced through chipping or shredding from disposal at any expansion of an existing landfill or from any new landfill built in Connecticut. The Department will evaluate the continued operation of existing unlined C&D landfills to determine if any restrictions are appropriate, in addition to the existing recommendation allowing disposal of only processed C&D waste in the future. As appropriate, this ban will be phased in for existing in-state landfills.

Strategy 4-4. Support reuse and recycling of highway/road C&D waste, and dispose of that portion that cannot be reduced, reused, recycled, or composted, in a manner that ensures protection of land, air,

and water resources and the public health in compliance with the state hierarchy for managing solid waste.

- The CT DEP supports continued processing of highway construction and demolition debris at its site of generation, and the reuse of asphalt, masonry, and concrete debris from state and municipal road projects and will provide priority review of applications for specific types of facilities critical to implementation of this strategy.
- CT DEP will work with municipalities to develop a model plan or ordinance to explore the possibility of promoting consistency among municipalities regarding permits for concrete crushing facilities so that concrete can be recycled and reused by contractors on location. Few communities in Connecticut allow for small concrete crushing facilities on site (these allow a contractor to take unused concrete and crush it down to be reused). While recognizing this is a local issue, regional sites around the state could be set up to accommodate and encourage concrete recycling.
- CT DEP will recommend that road and highway C&D waste that cannot be reused, recycled, composted, used in clean energy technologies, or incinerated at RRFs to be directed to landfills, preferably lined.

Strategies for Land Clearing Debris

Strategy 4-5. Increase the recycling, composting, and beneficial use of land clearing debris.

- CT DEP will seek funding to support chipping of land clearing debris by municipal and state facilities. This could include funds for the purchase of wood chipping equipment to be shared by municipalities on a regional basis.
- CT DEP will develop a model plan and promote the amendment of municipal land use regulations to require a plan for proper management of land clearing debris from land development.
- CT DEP will work with the appropriate state agencies to promote the development of markets for recycled organic material, including clean wood chips, by drafting state procurement specifications for recycled organic material and developing a program to require the use of recycled organic materials from authorized recycling or composting facilities in state-funded projects.
- CT DEP will promote the establishment of a web based “clean wood chip exchange” so that those who need chips can locate sources of wood chips and vice versa.
- CT DEP, in conjunction with the appropriate state agencies, will promote appropriate uses and markets for the use of woodchips from land clearing debris to support composting and their use as a bulking agent.
- CT DEP will re-evaluate its permitting requirements related to land clearing debris. A review will be conducted to determine whether permitting requirements

can be reduced for facilities that process this waste and whether oversight of wood grinding operations could be delegated to the municipalities.

- CT DEP will recommend that CGS Section 22a-174(f) be amended to prohibit open burning and CGS Section 22a-208x be amended to prohibit the disposal of land clearing debris at landfills, however these prohibitions may be exempted in the event of a natural disaster. In all cases, landclearing debris would be required to be chipped before being disposed at the landfill.

Strategies for Oversized MSW

Strategy 4-6. Increase the reuse and recycling of oversized MSW.

CT DEP, regional solid waste and recycling entities, and municipalities need to increase the reuse and/or recycling of usable oversized MSW (e.g. furniture, mattresses, pallets, spools, and carpets) by:

- Supporting municipal efforts to promote the reuse of oversized MSW through local swaps located at municipal transfer stations, recycling drop-off facilities, etc.;
- Supporting and promoting the use of material exchanges and other reuse programs such as the Institutional Recycling Network, charitable organizations, pallet reuse programs, consignment shops, etc. to increase the reuse of furniture and other usable oversized items;
- Partnering with groups such as the Product Stewardship Institute to promote producer responsibility for hard to manage oversized MSW such as mattresses;
- Working with Carpet America Recovery Efforts, (CARE) and/or other regional or national programs and non-governmental organizations to increase the recovery of old carpet for recycling in Connecticut; and
- Explore new technology and options for implementing recycling programs for oversized MSW such as technologies for recycling durable plastic products.

Strategy 4-7. Manage oversized MSW that cannot be reused or recycled in a manner that ensures protection of land, air, and water resources and the public health in compliance with the state hierarchy for managing solid waste.

The untreated wood portion of oversized MSW that cannot be reused or recycled should be deconstructed for use in clean energy technologies and the rest should be properly disposed in accordance with the solid waste management hierarchy.

Strategies for Electronic Wastes

Strategy 4-8. Seek legislation that provides for recycling of electronic wastes based on a producer responsibility model.

In June 2005, the Connecticut DEP sponsored a public Stakeholder Forum to consider how the State should manage the solid waste generated within the state. At the forum, recycling/re-use of electronic waste was identified as a priority issue that should be addressed in the near term. Participants at the Forum called for eliminating electronics

from disposal at landfills and resources recovery facilities and for developing programs involving shared responsibilities amongst producers, consumers, retailers and government to address this issue. There has been considerable debate on national, regional and state levels as to the best approach to resolving the electronic waste management problem. To date, no national consensus has been reached but a small number of states have moved forward on legislation with regard to the management of electronic wastes. The CT DEP will seek legislative authority to develop a system for the collection and recycling of electronic waste including oversight by an electronic products recycling authority charged with assessing and collecting fees from manufacturers of electronic products necessary to cover the cost of developing and implementing such a program, including but not limited to collection, recycling, consumer education, and administration. Manufacturers should support such a system proportionate to their market share of electronic products sold in Connecticut or by directly collecting and recycling an equivalent amount. After a program is established, a manufacturer who fails to comply should be prohibited from offering their electronic products for sale in Connecticut and after the system is up and running a disposal ban should take effect. This approach will provide the greatest flexibility in implementation and benefits from market-driven innovation, while reducing the State's role.

Household Hazardous Waste Strategies

Strategy 4-9. Enhance the statewide Household Hazardous Waste Program.

- Implement strategies listed in the Source Reduction Section of this Chapter to encourage businesses, manufacturers, and consumers to reduce their use of toxic products and to use less toxic alternatives.
- CT DEP will: (1) encourage municipalities to further regionalize HHW programs and allow members of different regions to utilize any regional site; (2) encourage programs to offer collections to small businesses (CESQGs); and (3) will work with municipalities and planning regions, especially those currently not participating consistently in HHW programs, to identify the barriers to HHW collection programs and work towards developing strategies to address the barriers.
- CT DEP will work with retailers, manufacturers and realtors to improve HHW management opportunities. CT DEP will develop strategies in which retailers and manufacturers support HHW management efforts in Connecticut. Such strategies include but are not limited to:
 - Encourage manufacturers to develop educational materials explaining proper use (e.g., avoidance of overuse) and management of their products;
 - Encourage manufacturers of low-toxic or non-toxic materials to produce literature or participate in public environmental events, to encourage reduction of the use of household toxics.
 - Encourage realtors to educate homesellers and/or homebuyers as to the proper disposal of HHW related to property transfer.

- Implement a statewide paint recovery program in conjunction with appropriate state and regional authorities. This program will include working with recycled-content paint manufacturers, major purchasers and end-users of paint to develop and showcase markets for recycled paint products. Latex paint in particular is an attractive pilot opportunity for product stewardship recovery programs because of the high volume of use and lower handling risks.
- Continue to aggressively implement the Mercury Reduction and Education Act to reduce the prevalence of mercury-added products in the waste stream and promote producer based mercury collection programs. The CT DEP should survey generators of mercury, such as schools and dental offices, to assess the need for mercury-collection events.

Strategies for Other Types of Special Waste

Strategy 4-10. CT DEP will continue to monitor and research management options for other types of special wastes that have not been adequately addressed to date, or as problems and the need arises, and as resources allow. Types of wastes that need to be addressed include: animal mortalities; road wastes; dredge material from Long Island Sound; contaminated soils; sewage sludge; water treatment residual solids; preservative treated wood; sharps and waste pharmaceuticals; disaster debris; and other materials as appropriate.

- **Animal Mortalities.** CT DEP will develop and disseminate best management practices (BMPs) for managing animal mortalities. The CT DEP, in consultation with state agencies and municipal officials, will develop BMPs for state agencies and municipalities concerning strategies for small-scale animal mortality management. The same BMPs may be applicable in certain situations for daily or occasional farm mortalities, although this sector appears to have acceptable existing practices. In the event of a catastrophic pathogenic mortality event, state and federal health and agricultural agencies will be consulted regarding the appropriate disposal method.
- **Road Wastes (Street Sweepings and Catch Basin Cleanings).** CT DEP will undertake several efforts to address this category of wastes, including the following:
 - Develop a General Permit for the reuse of soil that meets certain criteria for roadbed application/use and consider including street sweepings under this permit.
 - Encourage and provide technical and financial support to towns to (1) conduct their own studies to characterize this type of waste within their town; (2) seek ways to modify existing practices to minimize application of sand and salt; and (3) evaluate the feasibility of developing regional storage/processing facilities where road wastes can be consolidated and stored for testing and/or reuse and treatment.

MOVING TOWARDS CONNECTICUT'S VISION: OBJECTIVES AND STRATEGIES

- **Dredge material from Long Island Sound.** The CT DMMP for Long Island Sound that is required to be prepared pursuant to EPA's final rule (40 CFR 228) concerning ocean disposal and the designation of dredged material disposal sites in Central and Western Long Island Sound must be prepared by 2013. The Plan will include the identification of alternatives to open-water disposal and the development of procedures and standards for the use of practicable alternatives to open-water disposal.
- **Contaminated soils.** Evaluate and seek appropriate changes to the existing statutory and regulatory requirements for the reuse of soil with lower levels of contamination to encourage its reuse in a manner that is both protective of human health and the environment and minimizes the need for permanent disposal. Develop general permits for the management, handling, and beneficial reuse of contaminated soils.
- **Sewage sludge.** The Department will monitor new technologies for dealing with this waste in an environmentally preferable manner. Currently, there are no requirements for owners or operators of in-state sewage sludge incinerators to report the amount and destination of ash generated by their facilities. The CT DEP will establish reporting requirements for these facilities to provide such information to the CT DEP.
- **Water Treatment Residual Solids.** The Department will continue to act upon submitted operations plans for the re-use of this material; however, for those uses that have significant environmental and public health implications, these would be considered under a General Permit for Beneficial Use. These types of permits will be given priority consideration by the CT DEP.
- **Preservative treated wood.** The CT DEP will assess the feasibility of requiring that waste preservative treated wood that cannot be source reduced, reused or recycled to be disposed in lined landfills and will keep abreast of developments regarding alternative environmentally preferable waste management options for preservative treated wood.
- **Sharps and waste pharmaceuticals.** There needs to be better management of the collection and disposal of sharps generated from home veterinary and home medical care. The CT DEP will identify and seek partners to assess, evaluate and recommend appropriate management of this type of waste. CT DEP will also begin to engage stakeholders in discussion on the emerging issue of waste pharmaceutical disposal.
- **Disaster Debris.** CT DEP will have a Debris Management Plan in place by mid-2007. This Plan will provide information on planning effective disposal methods and on-going actions to comply with State and federal EPA regulations, disposal procedures for contractors, businesses and homeowners, debris pick-up schedules and warnings against illegal dumping. The Plan will be NIMS compliant that takes into account three key organizational systems: the Incident Command System that the State of Connecticut's Department of Emergency Management

and Homeland Security would lead, the multi-agency coordination system, and the public informational system.

4.3.5 Objective 5 - Education And Outreach

Significantly increase awareness and understanding of waste management needs, impacts, and the critical social, economic, and environmental issues facing Connecticut, and build support for programs to engage citizens in actions needed to maximize waste reduction and recycling and minimize the need for additional disposal capacity.

Overview

Connecticut has a mature recycling and source reduction program. The recycling mandate was initiated in 1991 when there were multiple resources available to municipalities, regions and the State to provide education programs. Through the work of a CT DEP Recycling Education Coordinator, the Department was involved in a variety of efforts to educate the public on these issues. For example, the Department provided "template" graphics for all signs and other educational materials that provided for a uniform look to the education campaign. The Department also managed a statewide advertising campaign that provided regular reminders to the public to recycle. The State funded entertaining presentations on recycling for schools featuring Connecticut's recycling superhero, Ray Cycle. State grant funds were also available to cover the creation of educational materials, workshops, etc. Also, the participation by municipalities and regions was high.

Over the last several years, recycling education efforts at the local, regional and State levels have diminished greatly. Some of the on-going recycling education efforts include web based education and outreach material, as well as recycling education centers and museums supported by regional waste authorities. The CT DEP no longer has a Recycling Education Coordinator and does not provide any recycling education funding to towns. Very few municipalities have a dedicated staff person to manage their local recycling programs. As a result, local recycling education efforts have suffered and the number of messages that people receive to recycle has been dramatically reduced. However, there are some municipalities and regional waste authorities that have continued to actively educate their residents about recycling.

Due to the changes in the amount of recycling information given locally, and the differences between municipalities with regard to what recycling messages get to their residents, market research would help to update the best way to reach a statewide recycling and source reduction audience. More needs to be done to educate the public concerning environmental sustainability with regard to everyday decision-making and the potential impacts to the environment. The public education methods used in 1991 may no longer be appropriate and resources currently available are limited, so it is important to target messages as much as is possible.

Current Education and Outreach Practices

A wide range of education and outreach efforts have been undertaken in Connecticut by the CT DEP, CRRA, other regional waste authorities, and local and regional government agencies. Additionally, the CT DEP and other organizations have sought to compile materials and resources from other states and to make them freely available in Connecticut. However, due to decreasing staff and resources at all levels, these programs are not as effective as they could be. Current recycling education resources include:

- The CT DEP web site which contains information on Connecticut's waste management programs, regulations and related topics; source reduction, recycling and composting fact sheets, brochures and posters; videos and audio visual resources; K-12 educational materials; information regarding municipal recycling contacts; resources and information on pollution prevention and source reduction, including fact sheets, and case studies; and technical information on green building, pollution prevention, and tips for greener home purchases.
- The CRRA operates two museums: the Visitors Center & Trash Museum in Hartford and the Children's Garbage Museum in Stratford. Each museum has a viewing area where visitors can observe the working regional recycling center and get other information on recycling. Approximately 50,000 people of all ages visit the museums each year. CRRA also has books and videos about solid waste and recycling topics available to borrow as well as curriculum and loan kits. In addition, CRRA representatives are available to speak at community events and group meetings about solid waste and recycling issues. CRRA has one full-time and five part-time educators on staff.
- The Southeastern Connecticut Regional Resource Recovery Authority (SCRRA) runs a successful recycling education center located at the Groton IPC. This facility provides recycling and solid waste education to area schools and civic groups. Education outreach is available either at the Education Center or, upon request, at area schools. Similar to the Hartford facility, albeit on a smaller scale, demonstrations and viewing of the working IPC are available.
- The Tunxis Recycling Operating Committee (TROC), the Housatonic Resources Recovery Authority ("HRA"), and some Connecticut municipalities also are involved in a range of education and outreach efforts. TROC and HRA have each developed an excellent website for residents to access. In 2006, TROC shared with DEP and other regional recycling programs, the results of their new market research effort to better understand factors influencing recycling among its residents and identify areas where key improvements need to be made in order to increase recycling participation. In another example, the City of Hartford provides a six-page, comprehensive printed guide to recycling opportunities and regulations, downloadable from its web site.
- A review of the web sites of recycling regions and the fifteen largest Connecticut municipalities showed that only two regions have recycling web sites and, generally, municipal recycling education is lacking beyond basic information

about the types of materials to be recycled curbside and how to prepare them. Very few web sites stress the reasons to recycle or the benefits of recycling. Most mention that recycling is mandatory.

Barriers to Effective Education and Outreach Efforts

Current education and outreach efforts in Connecticut suffer from several shortcomings. These shortcomings stem from the lack of resources, both funding and staff, to support solid waste education programs and include:

- No centralized, comprehensive way to access all materials;
- Some materials are out of date or in need of revision to refresh their message and approach;
- Lack of a coordinated strategy regarding top priority messages, target audiences, desired outcomes or approaches;
- A large number of uncoordinated web sites, often incorporated within the main web site of government agencies or other large organizations, that can be difficult to find and cumbersome to use;
- No resources for statewide media messaging and apparently very little media messaging at the local level;
- Few efforts targeting education at the college and university levels, or for professionals working in the solid waste management or recycling fields in Connecticut; and
- Lack of a consistent and identifiable messages concerning source reduction, recycling, or other waste management related issues in Connecticut.

Education and Outreach Opportunities and Priorities

There are many opportunities to strengthen education and outreach efforts, each involving varying commitments of additional funding and resources. Connecticut's top priorities for education and outreach are to promote:

- General awareness of Connecticut's disposal capacity shortfall and how increased source reduction, recycling, and composting will help address this issue;
- Greater understanding of the environmental and economic benefits of source reduction, recycling, and composting;
- Greater understanding and motivation to participate in local waste diversion programs;
- Greater communication and coordination among all stakeholders, especially state, local and regional waste management organization; and
- Greater consistency in the message given out to the public of the mandated items to be recycled, while at the same time supporting those municipalities and others who have chosen to be more proactive in recycling more materials.

Strategies

Strategy 5-1. Undertake education and outreach actions using minimal additional resources. Such actions could include: coordinating existing resources and sharing information; enhancing the CT DEP website; promoting awareness through recognition programs; integrating solid waste issues with other environmental issues; ongoing outreach to media; and encouraging municipalities to provide solid waste and recycling information to residents and businesses.

At a minimum, the following actions should be taken to improve solid waste education statewide using additional staff time from existing municipal, regional, CRRRA and CT DEP resources:

- Convene a group of existing providers to coordinate existing educational resources. Insert hotlinks on the existing recycling websites of the CT DEP, CRRRA and their museums, TROC and HRRRA, and municipal web sites to connect resources and information. Links should also be provided on web sites of related environmental issues, such as climate change, environmental purchasing, others.
- Expand and enhance the CT DEP internet site concerning waste management topics.
- Continue to use existing awards and recognition programs to promote awareness and recognize and support exemplary source reduction and recycling actions of businesses and other groups. Such actions are currently eligible for recognition through two established CT DEP recognition award programs (Connecticut Municipal Recycling Honor Roll, Green Circle Program) and the Connecticut Climate Change Leadership Awards Program.
- Incorporate recycling education into existing outreach on related issues. The State's outreach material and events on the Connecticut Climate Change Action Plan 2005 includes information on recycling. Other environmental education and outreach programs should also promote recycling. Environmental sustainability concepts should be introduced and discussed. Incorporating the message into broad environmental outreach is both an efficient and effective way to reinvigorate recycling awareness.
- Catalog and disseminate information among providers regarding best practices that have shown results at the local or regional level.
- Develop on-going outreach to the media to encourage articles and distribute press kits outlining benefits of source reduction and recycling in Connecticut.
- There are many education and outreach activities that could be undertaken at the local level that can significantly bring about increased recycling and composting participation by municipal staff, residents and businesses. Municipal governments can add educational information or notices regarding town solid waste management issues to their routine mailings to residents (e.g., mandated items to be recycled; HHW hours of operation; special waste pick-ups; the actual cost of

disposal of residential MSW, other topics); post/display notices and/or hand-out notices to residents and commercial users at municipal transfer stations; encourage awareness and action regarding source reduction and recycling at town offices, buildings, and functions.

Strategy 5-2. Undertake education and outreach actions using additional resources. These actions can include: providing comprehensive assistance to regional and local outreach programs; developing partnerships; and assessing and modifying outreach programs on a two year basis.

With adequate funding, the following initiatives would also increase awareness and participation in waste diversion programs:

- Provide funding, materials, coordination assistance, and support to regional and local education and outreach programs. Assess appropriate mechanism for allocation of funding. Establish a statewide recycling education coordinator and a program to build institutional capacity on education and outreach approaches at the State and local levels and to secure partnerships with other states, trade associations, and agencies. The statewide education program will be coordinated and implemented from a single location, with a qualified staff and ample resources. The coordinator will solicit proposals from other groups to carry out certain projects and activities. Among others, these groups may include the CT DEP, CRRA, university departments or non-profit organizations, possibly in partnership with one or more private public relations firms. The recycling education coordinator, will work to build partnerships with other states, U.S. EPA, trade associations, NGOs, and others to build institutional capacity for education and outreach by regional organizations and local governments, especially to enable their adaptation and use of state education resources and efforts to increase consistency among local programs and approaches. Local and regional parties will also be program partners.
- Partner with existing organizations and educational centers. The Department will investigate opportunities for partnering with the new Connecticut Science Center. Connecticut can seek to secure funding and partners to support an ongoing statewide and local education and outreach campaign to promote and support closely aligned local efforts. Given the high level of interest in reinvigorating recycling by the U.S. EPA, the National Recycling Coalition (NRC), other states, trade associations, product producers, retail stores and others, there are numerous opportunities for partnering.
- Measure progress, update and refine education and outreach approaches at least every two years. Measuring progress in education and outreach programs is difficult. However, it is essential to make determinations about what is working and what needs to be refined.
- Increase accessibility to available information on environmental sustainability. Cross-reference this topic with existing CT DEP data and other websites.

Strategy 5-3. Undertake education and outreach actions using expanded resources. These actions can include: researching and developing effective outreach approaches; disseminating new educational and outreach materials; developing an independent recycling web site that acts as a clearinghouse and listserve for municipal and regional recycling coordinators; and developing education and technical assistance for targeted sectors.

With significant funding, a comprehensive education program could include:

- Conducting research (including surveys and focus groups) and evaluating existing materials to determine the most effective targets of an education and outreach program, including desired outcomes, target audiences, messages and approaches. An effective education and outreach program will use research as a basis for justifying expected outcomes, identifying target audiences, and developing messages and outreach approaches tailored to achieving those outcomes. This program design should be reviewed and refined periodically.
- Based on the research, develop and disseminate new educational and outreach materials and/or repackage and adapt existing ones, with an eye towards promoting statewide consistency. An overriding goal of these efforts is to encourage use of consistent materials, messages and actual program design across Connecticut towns and regions, with the ability to adapt them to local program needs. Connecticut will also strongly encourage and support the use of existing materials and campaigns that further its goals.
- Develop an independent web site that acts as a clearinghouse for recycling information and resources in Connecticut. The web site will be based on research results and augmented to link to existing educational resources. The website can also include a list serve for municipal and regional recycling coordinators to share information on the effectiveness of source reduction and recycling programs.
- Develop targeted education programs for small businesses and other sectors without effective recycling programs.
- Develop an educational program on environmental sustainability.

4.3.6 Objective 6 - Program Planning, Evaluation and Measurement

Enhance local, regional, and state program measurement, evaluation, and planning practices to drive continual progress towards achieving Connecticut's waste management goals.

Overview of Program Planning, Evaluation and Measurement

Solid waste data collection and analysis and solid waste program planning and evaluation are intricately related. However the demands of each are distinct. In this

section, program planning and evaluation will be discussed separately from program measurement.

Planning and Evaluation Overview

Program planning and evaluation are essential elements of Connecticut's approach to achieving its solid waste management objectives, and especially to achieving its aggressive waste diversion targets. Program planning and evaluation ensures that Connecticut's solid waste management activities adapt over time to changing conditions and are continually improved to maximize effectiveness and efficiency. Planning is essential to ensure that overall local, regional, and state systems stay on track and are designed to achieve clear objectives, tied to the State's goals and long-term vision. Good planning is an iterative process fed by accurate data that is carefully evaluated and re-evaluated.

Measurement Overview

Effective solid waste management requires comprehensive and accurate solid waste data for:

- Solid waste projections and related planning and program evaluation to help decision makers plan at all levels;
- Assurance of compliance with solid waste statutes, regulations, and permit requirements;
- Measurement of progress towards solid waste management goals and calculation of environmental benefits associated with those goals. Measurement of progress is an essential element of Connecticut's approach to achieving its solid waste management objectives, and especially to achieving its aggressive waste diversion targets. Data and information are needed to measure progress towards local, regional and state objectives; and
- Business decisions regarding location in the state or region of: solid waste or recycling processing facilities, solid waste disposal facilities, solid waste transfer stations, and manufacturing facilities using recycled material as a feedstock.

The CT DEP will revise and enhance the solid waste reporting and measuring system to eliminate duplicative reporting requirements and reduce the reporting burden, while ensuring that the information most needed to plan, implement, and track performance is widely available.

Current Planning, Evaluation, and Measurement Practices

Current Planning and Evaluation Practices

This section provides a brief synopsis of Connecticut's program planning and evaluation system.

Connecticut's integrated waste management planning at the local, regional, and state levels is in need of revision and reinvigoration. The last formally adopted statewide solid waste management plan was prepared in 1991. Under the regulations adopted

MOVING TOWARDS CONNECTICUT'S VISION: OBJECTIVES AND STRATEGIES

pursuant to CGS section 22a-228, the Commissioner may amend the statewide solid waste management plan as needed and formally adopt such amendments on a regular basis. A draft revised plan prepared in 1999 included a thorough assessment of the State's system and many recommendations, but it was never formally adopted. Because of this long time lag, this statewide Plan examines a different state of affairs in waste management today and must plan for the ongoing evolution of Connecticut's waste management system.

While at the local level, prior to the adoption of the statewide plan, municipalities were once required to prepare their own solid waste management plans, no such plans have been prepared since the 1980's. However the need for local planning and coordination to assure the proper management of their solid wastes still remains. CGS Section 22a- 220 requires municipalities to make provision for the disposal of solid waste generated within their borders and to make provisions for the separation, collection, processing and marketing of state mandated recyclables. This obligation, taken in conjunction with the changes in waste management options, the evolving structure of the industry and the need to increase diversion, will only make coordinating local needs with regional and state planning more important.

At the regional level, a system of regional recycling programs and operating committees was formed in the early 1990s to assist member municipalities with recycling contracting and education. Grant funds were originally provided to assist the regions and their member municipalities in developing recycling programs and establishing and contracting with regional intermediate processing facilities. State grant funds also supported regional recycling coordinators. However, in recent years many regional programs have ceased or curtailed their recycling activities and state funding for these purposes has run out.

Common across all levels, state, regional, and local, is a lack of ongoing evaluation of the outcomes. Challenges with maintaining an up to date picture of the waste flow throughout the waste management system in Connecticut and a lack of resources dedicated to evaluating the effects of changes in that system have left an incomplete picture of waste management in Connecticut. The extended length of time between comprehensive reevaluations prevents or limits the timely change needed to keep the system fully functional.

Current Measurement Practices

This section provides a brief synopsis of Connecticut's program reporting system. The State's data reporting requirements are described and assessed in detail in Appendix B.

Prior to 1990, it was difficult to track total solid waste generated in Connecticut because much of Connecticut's solid waste was disposed in municipal landfills, many of which had no scales to measure waste. Starting in the mid-to-late 1980's CT DEP started tracking MSW disposed in Connecticut's resource recovery facilities and in some Connecticut landfills. In the early 1990s, the Department developed a comprehensive solid waste reporting system and computerized data base to track solid waste generation and management in the state. The accuracy of solid waste data,

MOVING TOWARDS CONNECTICUT'S VISION: OBJECTIVES AND STRATEGIES

especially for MSW, has increased over the past decade as more solid waste is disposed of through Connecticut permitted solid waste facilities that have scales and that submit solid waste reports to the CT DEP. As a result, the Department is now able to plan much more accurately for the state's solid waste management needs. The CT DEP also participates in regional and national efforts to track MSW imports and exports among the states.

Connecticut state statutes, regulations, and solid waste permits require municipalities, some scrap metal processors, and owners or operators of solid waste disposal facilities, solid waste transfer stations, recycling and composting facilities, and C&D volume reduction facilities to report solid waste and recycling data to the Department. The data is generally submitted on forms developed by the Department and include information about the type, origin, amount, and destination of waste received and processed.

The Department maintains most of the reported solid waste and recycling data in its computerized database. The data base is designed to track Connecticut solid waste generated, recycled, and disposed, and can aggregate data by town, region, and statewide for different categories of waste and recyclables. Data on MSW and different types of special waste such as ash residue, bulky waste and C&D wastes, are kept discrete.

Although there are issues with regard to the completeness of MSW data captured through the solid waste reporting system, the MSW data does allow for estimates adequate for statewide planning purposes. It needs to be noted that as more of Connecticut's MSW gets disposed out-of-state, tracking that information may become more difficult. Accurate or complete MSW disposal and recycling data for individual municipalities is more elusive. Some solid waste facilities misidentify the origin of waste received at their facilities due to inaccurate information from delivering haulers or to facility reports based on their billing system in lieu of CT DEP reporting requirements. This has made it more difficult to accurately track the flow of waste and recyclables and thus quantify such waste by municipality.

Data regarding resource recovery ash residue disposal are also adequate for planning purposes. However, C&D waste reporting is more incomplete and does not provide a complete picture of C&D waste management in Connecticut.

In addition to the issues mentioned above, there are other problems with the current solid waste reporting system. These include (1) reluctance of some haulers and facilities to divulge the origin or destination of waste allegedly due in part due to concerns regarding confidentiality; (2) checks and balances designed into the original database system result in duplicative reporting by municipalities and solid waste facilities for some disposal and recycling data; (3) some municipalities and solid waste facilities perceive reporting requirements to be unduly burdensome; and (4) the CT DEP does not currently have adequate solid waste data management resources leading to data entry report compilation, and analyses backlogs.

The CT DEP has used the reported solid waste data for some of the following purposes to:

MOVING TOWARDS CONNECTICUT'S VISION: OBJECTIVES AND STRATEGIES

- Track the state and municipal recycling, disposal and generation rates;
- Identify in-state disposal capacity issues;
- Calculate the environmental benefits resulting from the recycling of specific material types;
- Share information with other states looking at MSW import and export issues;
- Identify solid waste management needs;
- Track the success of Connecticut's recycling efforts and help identify recycling marketing issues;
- Track solid waste facility compliance with permit requirements;
- Help decide capacity for new solid waste facility permitting and for permitting expansions at existing solid waste facilities;
- Provide data to recycling processors, brokers, and manufacturers looking for sources of specific recycled materials for feedstock for paper mills and for other manufacturing processes; and
- Use as one of the criteria for naming a municipality to the Connecticut Municipal Recycling Honor Roll which is posted on the CT DEP website.

In the past, the CT DEP annually sent out recycling reports to each municipality. These reports provided the following information: (1) their per-capita MSW recycling and disposal rate; (2) total tonnages of MSW disposed and recycled by each town and for the state as a whole; (3) graphs comparing each town's MSW per-capita recycling rates for different materials to other towns with similar populations; (4) graph showing the town's annual per-capita recycling rate for the past five years; and (5) other pertinent recycling, generation, and disposal data. Municipalities use the data to track and evaluate the success of their recycling programs and to track destinations and amounts of MSW generated in their town and disposed. Although the CT DEP has used that data to recognize towns with exemplary recycling programs, it has never used that data to enforce against or offer assistance to a town not meeting mandated recycling obligations.

Barriers to Enhanced Planning, Evaluation, and Measurement

Barriers to Planning and Evaluation

Some of the barriers to providing adequate planning and evaluation include:

- The cost, lengthy process and complexity of updating state and local plans;
- A lack of up-to-date, comprehensive data on some of Connecticut's solid waste flows;
- A decline of support to some of the regional recycling operating committees which once provided a foundation for regional cooperation;
- The diminishing over time of recycling support provided to member towns by some of Connecticut's regional planning entities;

MOVING TOWARDS CONNECTICUT'S VISION: OBJECTIVES AND STRATEGIES

- An overall lack of funding and staff resources for program planning and evaluation;
- The lack of clear goals at the local level also contributes to a lack of innovation and program expansion or improvement over time; and
- Opposition to unfunded mandates placed on local governments.

Barriers to Enhanced Measurement

Some of the barriers to enhancing local, regional and state program measurement include:

- A lack of funding and staff resources for data collection, program measurement and evaluation;
- Scale software at solid waste facilities that is designed for billing purposes but not amended to also comply with DEP reporting requirements;
- Recycling and solid waste reporting is not a priority for municipalities;
- The difficulty of documenting recycling flows due to the many players involved and sensitivity over reporting potentially proprietary, business sensitive information to government agencies and/or solid waste facilities; and
- Difficulty in getting data on solid waste not captured by the current reporting system i.e., waste disposed or recycled without passing through a Connecticut permitted solid waste facility.

Opportunities, Priorities, and Strategies for Planning, Evaluation, and Measurement

Opportunities and Priorities for Planning and Evaluation

Connecticut must improve its solid waste planning and evaluation system in order to:

- Establish an iterative planning process based on a comprehensive picture of Connecticut's waste management system;
- Reinvigorate regional cooperation where it makes political and economic sense;
- Establish municipal and regional goals and planning requirements that will drive continual progress, and explore ways of ensuring that the State has adequate resources to provide assistance and to review, compile and approve information from the plans;
- Develop a system for establishing benchmarks based on best practices demonstrated across the state, and a system for sharing this information with all municipalities and regional districts; and
- Explore reducing the burden on municipalities by transferring a portion of responsibility for planning and education and outreach to regional entities.

Opportunities and Priorities for Measurement

Connecticut must improve its solid waste reporting system in order to:

- Establish a means to obtain solid waste data through reporting requirements that are less burdensome and less duplicative for reporting entities but still provide information needed for solid waste management planning and evaluation, assessment of environmental and economic benefits of recycling and source reduction, and private investment in recycling, composting, or reuse businesses.
- Establish municipal and regional disposal reduction goals that are less burdensome to accurately track and which will require more relevant reporting and measurement.

Strategies for Planning, Evaluation and Measurement

Following are the strategies Connecticut should pursue to strengthen its program planning, evaluation and measurement for solid waste management.

Strategy 6-1. Establish per capita waste disposal minimization goals for MSW and C&D /oversized MSW.

Since MSW disposal data is generally more complete, accurate, and easier to track than MSW source reduction and recycling data, the goals for minimizing disposal through source reduction, recycling, and composting will be expressed as per capita disposal rates rather than percent source reduction/recycling goals. For example, the per-capita MSW disposal minimization goal that would eliminate the in-state MSW disposal shortfall by FY2024 would reduce the current (FY2005) disposal rate of 0.8 tons/person/year to 0.6 tons/person/year by the year FY2024, by achieving a 58 percent recycling/source reduction rate. For C&D waste and oversized MSW, the goal will be to reduce the tonnage requiring disposal, but since data for this waste stream is incomplete, no numerical goal will be established at this time. The CT DEP will continue to track MSW and C&D waste recycling rates and will continue calculating generation rates as well.

Strategy 6-2. Minimize the reporting burden for municipalities and others by only requiring the collection of data necessary to support the goals of the Plan and provide the information needed for on-going solid waste management planning and evaluation.

The CT DEP will focus on getting more accurate solid waste disposal data statewide and for each municipality. The CT DEP will work with the Agency's Solid Waste Management Advisory Committee and other stakeholders to evaluate the existing solid waste data management system, make recommendations for improvements and implement these recommendations. Listed below are some considerations and approaches that may be undertaken.

- Amend the annual municipal and quarterly solid waste facility reporting requirements to: (a) eliminate duplicative reporting by municipalities in their annual municipal recycling reports; eliminate requirement for solid waste and recycling facilities to report duplicative information to both the CT DEP and to

municipalities; (b) require more meaningful municipal reporting of efforts to reduce waste generation and disposal through its recycling programs and services, and identification of needs; and (c) require haulers to report to the CT DEP on waste or recyclables not delivered to a reporting solid waste facility.

- To help assess the effectiveness of recycling, composting, and source reduction efforts, waste disposal characterization assessments should be conducted as necessary to evaluate municipal efforts and success in promoting and enforcing local recycling requirements.
- Under this strategy, the CT DEP will still require annual recycling reports from municipalities, but the information required will eliminate the duplicative and often burdensome reporting currently required of municipalities.
- The CT DEP will explore options for obtaining data or estimates of unreported recyclables, including bottle bill containers, lead acid batteries recycled through the deposit law, waste oil quantities recycled by automotive repair shops, scrap metal, recyclables backhauled to out-of-state retail distribution centers, and other commercial recyclables.

These proposed changes to Connecticut's current reporting system and goals (from a percent recycled goal to a goal of reducing the MSW per-capita waste disposal rate and reducing the tons of C&D waste requiring disposal) will strike a more efficient balance between the need for data and information, and the cost and burden associated with obtaining, compiling, and reporting it. This statewide goal system will effectively drive efforts to simultaneously minimize the amount of waste requiring disposal, help determine disposal capacity expansion needs, and provide a framework for increasing source reduction, reuse, recycling and composting.

Strategy 6-3. Establish a standing Agency Solid Waste Management Advisory Committee of affected stakeholders to help implement the new State Solid Waste Management Plan, revise the Plan, identify emerging issues, and find solutions.

An External Stakeholders Committee was a critical component in developing this Plan. This Committee included representatives from municipalities and government associations, regional waste management authorities, the solid waste management industry, the recycling sector, community and environmental groups, and business and waste generating industries. The CT DEP will convene a new standing Agency Solid Waste Management Advisory Committee that will again have broad representation of stakeholders. While the role and responsibilities of this Advisory Committee will need to be defined, further refinement of these strategies and identification of other solutions to these problems and issues will require continuing dialogue with stakeholders and other interested parties, including the general public.

Strategy 6-4. Implement an iterative planning process for the State's Solid Waste Management Plan to allow revisions on a more frequent and as needed basis, following a management system model of Plan/Do/Check/Act. A strong on-going stakeholder process, local

and regional planning, and an improved methodology for measuring success will inform the planning cycle.

Strategy 6-5. Evaluate and make recommendations for changes to underlying legal authorities to improve state, regional, and local solid waste planning and coordination. Develop system performance benchmarks relevant at both the state and local level aimed at achieving a unified solid waste management vision. Explore opportunities to fund planning activities at the state, regional, and local level, and develop incentives for full participation.

Strategy 6-6. Provide training and informational materials to municipal officials, regional and local waste management and recycling staff regarding best practices and strategies for strengthening solid waste and recycling programs. Encourage communities and regional recycling programs to share their best practices and strategies. Investigate the possibility of establishing a municipal solid waste/recycling mentor program.

- Encourage regional and local recycling programs to share recycling and other solid waste planning information. Explore the possibility of establishing a listserv for regional and local recycling coordinators.
- Offer training by the CT DEP for local staff and elected officials to assist regional entities and municipalities in planning and implementing waste reduction and diversion and other integrated waste management programs, pending availability of funding. Initial training will be based on explaining benchmarks for high performance programs and in accessing other technical or financial assistance as proposed in this Plan.
- Provide each municipality and recycling region with an annual assessment of their recycling/source reduction program. Use revised recycling and disposal data to evaluate the effectiveness of existing recycling source reduction efforts. Devise a system to reward municipalities, which have effective recycling programs, and provide incentives to maintain and increase their waste disposal reduction efforts. Identify municipalities which are not providing adequate recycling promotion and/or enforcement and offer technical assistance and, if indicated, disincentives for continually failing to fulfill their recycling/composting responsibilities.
- Annually report on the status of Connecticut solid waste management and provide, on the DEP website, statewide and municipal data on solid waste generation, disposal, and recycling/composting.

Strategy 6-7. The CT DEP will conduct a solid waste characterization study.

The CT DEP will conduct a waste characterization study for the purpose of better targeting waste disposal diversion efforts and estimating associated costs for managing the solid waste stream.

4.3.7 Objective 7- Permitting and Enforcement

Ensure that permitting and enforcement decisions promote the goals of the Plan and are made in a manner that is fully protective of human health and the environment; promote continuous improvement of the environmental permit application review and decision making process; achieve the highest level of environmental compliance through predictable, timely, and consistent enforcement and effective compliance assistance where appropriate; and improve communication with municipalities, business, industry, and the public on the regulatory process in order to assure compliance with environmental requirements.

Overview of Permitting and Enforcement

In keeping with those objectives, the CT DEP must: (1) improve the solid waste permit application review and decision making process to support the waste management goals of this Plan, especially those relating to increased waste diversion through increased source reduction, recycling, and composting, and (2) achieve the highest level of environmental compliance, especially for recycling and composting requirements, through predictable, timely and consistent enforcement and effective compliance assistance where appropriate.

Most of the solution to the solid waste problem in Connecticut will be found in efforts to increase the amount of waste diverted from the waste disposal stream through increased source reduction, recycling, and composting. CT DEP's permitting and enforcement policies will play important roles in helping to maximize effective recycling and composting. The traditional areas of permitting and enforcement will need to be assessed and, if necessary, amended so that they support the goals of the Plan while ensuring that solid waste is managed in a lawful manner that is protective of public health and the environment. Recognizing this, the Department must devote additional resources and give higher priority to permitting of recycling and composting facilities and beneficial uses of wastes and enforcement that support increased recycling and other waste diversion activities. Steps must be taken to streamline the procedures for permitting facilities that are needed to increase the diversion of waste. Overall, more resources must be devoted to enforcement to send the message that compliance with recycling laws and diversion requirements is a critical component of waste reduction, thereby eliminating any business advantage that could stem from non-compliance. Increased enforcement resources should be directed toward enforcement of the state's recycling laws as a very high priority, not as secondary priority violations as described in the Department's Enforcement Response Policy.

Current Practices and Barriers in Permitting and Enforcement

Permitting

There are approximately 200 solid waste handling and disposal facilities under individual permits and 81 recycling facilities under general permits in Connecticut, in the categories as listed below. With regard to individual permits, the CT DEP receives

MOVING TOWARDS CONNECTICUT'S VISION: OBJECTIVES AND STRATEGIES

an average of 40 individual solid waste facility applications each year and has been able to process a comparable number. Application fees for individual permits range from \$7,500 for a small transfer station to \$138,000 for a resource recovery facility, with annual fees from \$600 for a transfer station to \$4,125 for a RRF. Recycling general permit application fees range from \$200 to \$500 and there are no annual fees. However, as these general permits expire the associated fee schedules may be revised. Only in the last few years has the CT DEP Solid Waste Program been able to begin recovering from the loss of one third or more of its staff. Recent staff additions, along with significant improvements in its processing of applications over the last three years, have allowed the program to show a steady increase in the number of permit decisions over that time.

Listing of the type and number of solid waste Individual Permitted Facilities and the type and number of Recycling General Permitted Facilities as of 2006:

Individual Permitted Facilities

- 6 MSW RRFs
- 1 Incinerator for tires
- 32 Landfills
- 1 Vertical expansion landfill
- 2 Ash landfills
- 116 Transfer stations
- 27 Volume reduction facilities
- 6 Intermediate processing facilities
- 2 Composting facilities
- 5 Household Hazardous Waste permanent facilities.
- 2 Recycling facilities

Recycling General Permits

- 23 Drop-site facilities
- 15 Recyclables transfer facilities
- 9 Limited processing recycling facilities
- 34 Single item recycling facilities
- N/A Satellite drop-site facilities (facilities do not need to register with the CT DEP)

Registrations

- 94 Leaf composting facilities

MOVING TOWARDS CONNECTICUT'S VISION: OBJECTIVES AND STRATEGIES

One of the most significant problems of the solid waste permitting and enforcement program is that its legal underpinnings are old and in need of updating. The core solid waste statutes date from the 1960s, when the predominant means of disposal was by landfilling. Most towns had their own landfills, and waste from each town was trucked directly from the generator to the landfill and there was little or no need for transfer stations or volume reduction facilities. Statutory and regulatory amendments over the years were focused on resolving specific issues, and there were limited attempts to make comprehensive improvements to the statutes and regulations. This has resulted in statutes and regulations that are difficult to comprehend, interpret, and enforce, and that are contradictory in places. A major rewrite of the solid waste statutes and regulations is needed.

The Department has historically assigned all applications the same priority regardless of how beneficial the proposed facility may be in helping to meet the goals of the Solid Waste Plan. Hence, applications for beneficial uses of wastes and for individual recycling facility permits have been processed with all other types of solid waste permits, and the resulting lengthy turnaround time has functioned as a disincentive to potential applicants for new beneficial use activities. Although general permits were developed for some types of recycling activities thereby facilitating the approval of such recycling activities, the CT DEP has not developed general permits for other solid waste activities, thus losing an opportunity to more expeditiously approve certain waste activities.

In addition to facility permitting requirements, the CT DEP requires that waste haulers be permitted for the following activities: hazardous wastes, industrial liquids and biomedical wastes. However, haulers carrying solid waste and recyclables are not permitted by the CT DEP. The only comparable requirement in law is that haulers must register in the town(s) in which they operate. The lack of direct control over haulers leads to a number of problems. The lack of data reporting is particularly problematic for the small amount of waste generated in Connecticut that is direct hauled out of state without going through any permitted facility. This also makes it difficult to take enforcement against haulers that are not complying with state solid waste laws. If haulers are required to register with the DEP and report certain information, the DEP, municipalities, regional solid waste entities, and other solid waste planning groups will have a better understanding of the amount of solid waste hauled directly out-of-state. It will also facilitate compliance with solid waste requirements and will allow a leveling of the playing field in the assessment of the solid waste fee.

While the CT DEP was developing the proposed Plan, there was an on-going federal investigation of several waste haulers on racketeering and related charges in Connecticut. Following a federal indictment, Governor Rell called an Advisory Group to address this issue. In June 2006, the Advisory Group was formed consisting of the Departments of Public Safety, Consumer Protection, Environmental Protection, Public Health, the Office of the Chief State's Attorney and the Attorney General's Office. This Advisory Group was tasked to make recommendations regarding the creation of an Authority to oversee and/or license businesses engaged in transporting solid waste

in Connecticut. The Advisory Group submitted their six recommendations to the Governor in September 2006 and in their findings supported:

“... the adoption of the CT DEP’s proposed State Solid Waste Management Plan, as it relates to the hauling, transfer and disposal of solid waste, which offers broad based management standards and recommendations, including licensure by CT DEP of solid waste haulers and regulation of the industry’s environmental practices. Taken together, the licensure scheme proposed in the Solid Waste Management Plan and the business practices regulations that we propose below should provide a comprehensive, efficient and understandable mandate as to how trash haulers ought to conduct their business.”

Enforcement

The enforcement methods employed by the Department have not changed much over several years. The tools available for enforcement include warning notices and letters, notices of violation (NOVs), consent orders with or without penalties, unilateral orders, civil action through the Attorney General’s Office, and criminal action through the State’s Attorney’s Office and/or EPA. NOVs are issued fairly quickly and have resulted in meaningful return to compliance in many cases, however, if penalties are needed, the options for assessing them are time consuming.

The enforcement of recycling laws has historically been assigned lesser priority status than enforcement of other solid waste requirements, and violations have been considered secondary priority pursuant to the Department’s Enforcement Response Policy. The potential for greater environmental harm (pollutants emitted to air and water, energy and water use, green house gas emissions, natural resource use, etc.) caused by using virgin materials versus recycled materials as feed stocks to make new products has generally not entered the equation when establishing enforcement priorities. The overall result is that even clear violations of the State’s recycling laws may rank as a lower priority compared to other solid waste violations, and the rate of compliance with mandatory recycling laws has not markedly improved over time.

At the local level, resources are often limited as well and, as a result, many municipalities are not enforcing the requirements of their own local recycling ordinances. This is the case even though historically and by state statute, each municipality is (1) responsible for making provision for the safe and sanitary disposal of all solid wastes generated within its boundaries and for the separation, collection, processing, and marketing of designated recyclables, (2) authorized by State statute to take enforcement actions with most municipalities having stated fines and penalties in their municipal waste and recycling ordinances, and (3) required to have a local recycling ordinance. Some municipalities have not deemed it a priority to enforce recycling and other solid waste requirements.

Strategies for Improving the Solid Waste Permitting and Enforcement Programs

Strategies and policies that once supported a sound program for managing solid waste can no longer be relied upon to address current and future challenges. With dramatic

changes in many facets of the solid waste universe, including the shift from landfilling of municipal solid waste to transfer stations, resource recovery facilities, the growing export of solid waste to other states, and the continuing trend toward cheap throw-away consumer products, the response of the Department must adjust to meet the demands of the times. Although there has been increased productivity in solid waste permitting recently, additional changes must be made to streamline the permit process for traditional facilities and to assure that permit requirements for those traditional facilities promote the State goal of reducing the amount of waste disposed by increasing recycling. Efforts must also be made to expedite approvals for recycling and other beneficial use activities, including review and adoption of alternative methods for authorizing certain beneficial uses, such as exemptions from traditional permitting for reuse of eligible solid wastes. Additionally, the CT DEP must continue to recognize the opportunities presented by properly closed landfills for other appropriate use, such as creating much needed grassland and shrub land habitats for wildlife.

Permitting Strategies:

- Strategy 7-1. CT DEP will make the permitting of solid waste facilities that increase waste diversion from disposal a priority.**
- Strategy 7-2. CT DEP will designate a permitting team whose responsibility is to review all solid waste diversion applications and to make determinations in a timely manner.**
- Strategy 7-3. CT DEP will facilitate the permitting process by developing model permits and fact sheets for applicants and interested parties, so that the process and the applicant's obligations are well defined and readily comprehensible.**
- Strategy 7-4. CT DEP will establish target time frames for acting on solid waste diversion and beneficial use applications.**
- Strategy 7-5. CT DEP will conduct a comprehensive assessment of the state statutes and regulations as they relate to solid waste management and to the implementation of the State Solid Waste Management Plan. In its review, the CT DEP should take into account broader environmental concerns, such as air and water issues.**
- Strategy 7-6. CT DEP will streamline the beneficial use process, with consideration given to an exemption from permitting for certain types of materials.**
- Strategy 7-7. CT DEP will establish a streamlined method of regulating waste haulers in order to incorporate reporting and other substantive requirements, along with a simple means of assessing the solid waste fee. Any action taken by the CT DEP will be consistent with the Governor's Task Force Report recommendations that are carried forward.**

- Strategy 7-8.** CT DEP will seek authority to establish categories of demonstration projects that would not require traditional permitting.
- Strategy 7-9.** CT DEP will continue to identify activities appropriate for approval by general permit, and devote staff resources to this effort.
- Strategy 7-10.** CT DEP will develop a procedure to allow the modification of existing permit approvals in order to facilitate improved or modified business operations and enhanced protection of the environment that are needed due to evolving technologies, markets conditions, and environmental concerns.
- Strategy 7-11.** CT DEP will seek amendments to CGS Section 22a-208a(d) to allow municipal transfer stations to accept and do minimal separation of residentially generated construction and demolition waste without requiring full permit modifications and fees.
- Strategy 7-12.** CT DEP will establish criteria for C&D waste Volume Reduction Facilities to help ensure that more of this waste stream is diverted from disposal.

The following are examples of criteria to be considered:

- Encourage source separation of construction and demolition prior to acceptance at VRFs as necessary to maximize recycling;
 - Sort and process construction and demolition waste in a manner that will minimize contamination of recyclable materials and maximize the quantity of reusable and marketable recyclable materials;
 - Minimize the quantity of waste and processing residue requiring landfill disposal;
 - Meet all statutory and regulatory requirements for the permitting of solid waste facilities; and
 - Consider requiring the development and operation of a VRF at each new lined special waste landfill.
- Strategy 7-13.** CT DEP will seek and encourage public input at the appropriate steps with regard to the development of General Permits for certain activities and Beneficial Use General Permits.
- Strategy 7-14.** CT DEP will consider host community agreements as part of the re-writing of the solid waste regulations. Until such time regulations are adopted, host community agreements shall be encouraged on a case-by-case basis.
- Strategy 7-15.** CT DEP will continue to evaluate the environmental impacts of the alternatives for solid waste disposal and will examine its authority to require an applicant for new capacity and disposal to provide detailed information on such impacts.

Enforcement Strategies

- Strategy 7-16.** CT DEP will increase its compliance outreach efforts to develop a more comprehensive and mutually supportive network of communications with land use, public works, and other municipal officials who are directly involved in solid waste activities. CT DEP will take appropriate actions to ensure compliance.
- Strategy 7-17.** CT DEP will take enforcement actions against recycling law violators as necessary to ensure compliance.
- Strategy 7-18.** CT DEP will evaluate incentives that would encourage municipalities to take on enforcement responsibilities they are already authorized to do.
- Strategy 7-19.** CT DEP will establish civil penalty regulations for violations of recycling laws.
- Strategy 7-20.** CT DEP will evaluate additional tools for taking enforcement actions against violators of the solid waste statutes, regulations and permits.
- Strategy 7-21.** CT DEP will ensure that RRF's and other solid waste facilities including landfills and transfer stations comply with CGS Section 22a-220c(b) which requires solid waste facilities periodically to inspect loads delivered to them for significant quantities of recyclables and report such violation back to the municipalities.

4.3.8 Objective 8- Funding

Adopt stable, long-term funding mechanisms that provide sufficient revenue for state, regional and local programs while providing incentives for increased source reduction and recycling.

Overview

Establishing a long-term, stable system for providing adequate revenue to state, regional and local waste management entities and for funding waste disposal diversion efforts is the single most important requirement for achieving Connecticut's solid waste management goals and objectives, and realizing Connecticut's long range waste management vision. Funding mechanisms not only provide revenue, but they also can be structured to provide incentives for promoting waste diversion by waste generators, haulers, processors, recyclers, local governments and manufacturers.

Connecticut's citizens and decision makers need to understand that the State must increase funding for programs that divert waste from disposal in order to mitigate the potential increased environmental and economic costs of disposing even greater amounts of waste, either in-state or out-of-state.

Current Solid Waste Management Budgeting

Currently Connecticut pays for solid waste management activities as follows:

- Local governments, taxpayers and waste generators are responsible for paying the vast majority of all solid waste management costs in Connecticut.
- Some regional authorities and municipalities assess a surcharge on disposed waste to fund their programs.
- Some towns still own and operate their own bulky waste landfills. However, most solid waste generated in Connecticut is disposed or recycled through regional solid waste facilities, which generally charge tipping fees for disposal or processing, whether located in Connecticut or out-of-state.
- Residential solid waste and recyclables are collected curbside either by municipal employees or by private haulers who are paid by residents directly or paid through town contract. There are usually tipping fees for waste or recyclables delivered to solid waste facilities. In some cases, the waste hauler pays the fee, and in other cases the municipality pays it. Some recycling facilities provide revenue sharing for the recyclables delivered to their facility, when market value exceeds a set value. The tipping fee paid for waste delivered to the Mid-CT RRF and Bridgeport RRF subsidizes the fee for residential bottles, cans, and paper delivered to the Hartford or Stratford IPC, so there is no separate tipping fee for member town residential recyclables delivered to these two IPCs.
- In some towns, residents and small businesses can still self-haul their recyclables or garbage to a municipal transfer station. Non-residential solid waste and recyclables are collected by private haulers who are paid by their customers. There are a few exceptions where municipalities provide this service. The haulers pay tip fees at transfer stations, disposal facilities, and recycling processing facilities.
- Connecticut's bottle bill beverage distributors reimburse retailers or redemption centers the five cent deposit plus a handling fee of one and a half cents for each beer container and two cents for each carbonated soft drink (including mineral water and soda water) container redeemed and handled by the retailer or redemption center. Distributors retain the unredeemed deposits from consumers who choose not to redeem their bottles and cans. This is a significant sum of money.
- Certain recycling collection programs are the responsibility of industry groups. For example, the beverage industry provides for redemption of bottle bill containers (as mentioned above); rechargeable batteries can be returned for recycling through programs developed and funded by the Rechargeable Battery Recycling Corporation (RBRC) program; lead acid storage batteries are returned to retailers for recycling by consumers to recover a deposit paid on the purchase of new batteries; directory publishers distributing their directories in Connecticut are responsible for recovering a percentage of those directories for recycling.
- CT DEP programs related to solid waste management are funded in part by a \$1.50 fee on all waste disposed at Connecticut's resources recovery facilities pursuant to

the Solid Waste Assessment CGS Section 22a-232. That assessment is placed in the solid waste account which is used by the CT DEP for a variety of solid waste planning, protection, and enforcement activities, including but not limited to, pollution prevention, dioxin and furan testing, solid waste inspection, permitting and enforcement, solid waste facility operator and inspector training, technical assistance and outreach, and CT DEP staffing necessary to carry out such activities. In 2005, \$2.9 million of revenue from this source was budgeted by Connecticut DEP to cover 29 positions and some limited contracted services related to the management of solid waste.

Recycling and Composting Program Funding History

In the late 1980s and early 1990s, Connecticut distributed approximately \$42 million in grants to Connecticut municipalities and recycling regions to help develop Connecticut's recycling program infrastructure and to support regional recycling coordinators, education, and outreach. This funding was allocated as follows:

- \$34 million in bond funds was used primarily for capital purchases of equipment such as tub-grinders, recycling trucks, and recycling and composting bins;
- \$5.2 million trust fund was used primarily for public education, planning, project management and staff costs for regional recycling coordinators, and
- \$2.8 million in fuel overcharge funds were dedicated to two regional "demonstration projects," one in the southwest part of the state for the purchase of curbside recycling bins and one in the southeast part of the state to support modifications of an IPC in Groton.

At the same time, state recycling program costs were funded by a one-time allocation of \$10 million from state surplus funds under PA 86-1, Special Session II. Authorized uses included, but were not limited to the costs associated with the development of a statewide recycling program plan, grants, and CT DEP administrative costs. The State Recycling Program did not receive authorization for any dedicated annual fees, assessments, or taxes to maintain the program until the early 1990s when the legislature established a two-year assessment of \$0.40/ton for solid waste processed at resource recovery facilities or disposed at MSW landfills. This assessment netted about \$900,000 to the CT DEP to support the State Recycling Program. The remaining \$1.3 million was used to provide a grant to the Southeastern CT Regional Resources Recovery Authority to subsidize RRF tipping fees. In 2005, the \$1/ton solid waste assessment was increased by 50 percent to \$1.50 per ton to help support approximately 29 staff in the CT DEP. This includes the seven staff formerly supported by the Recycling Trust Fund that was depleted in 2005.

Funding Needs

As a result of the investment at both the municipal and state levels, Connecticut has achieved an estimated 30 percent MSW recycling rate (rate consists of 24 percent reported; six percent estimated) and although this represents significant progress, this rate has not increased in years. In addition Connecticut has made little progress in diverting other types of waste from disposal (e.g., C&D wastes, electronics, food

wastes). Connecticut's current levels of source reduction, recycling and composting are insufficient to meet this Plan's goal for solid waste disposal minimization.

In order to reverse these trends and meet the Plan's goal for solid waste diversion, Connecticut needs to reinvigorate its source reduction and recycling efforts by implementing the strategies presented in this plan to ensure that the Plan's aggressive goals for reducing solid waste generated and disposed are met. To accomplish this, a stable and on-going mechanism for funding recycling and source reduction efforts at the local, regional, and state levels is needed. Such funding is especially critical to support municipal recycling and source reduction programs. In addition, financial mechanisms and support should also be provided for the private business sector to assist in the development of markets for recyclables or to help in their recycling efforts.

Estimating the exact costs to implement Connecticut's solid waste management strategies, as detailed in this chapter, is difficult. Many of the strategies will evolve over time, and responsibilities will vary. Funding requirements will vary based on, for example, how strategies are implemented, who implements them, does so when they are implemented, and the extent to which they are implemented. Most importantly, many of the strategies proposed in this Plan can be implemented at varying levels, with different levels of funding.

Funding Barriers

The barriers to creating a stable source of funding for solid waste programs are clear: no one wants to pay increased costs for services. Making the problem worse, citizens, legislators, municipalities, businesses, and many state agencies are relatively unaware of some of the significant solid waste disposal issues and the economic and environmental ramifications Connecticut will be facing in the next ten years. As a consequence, these issues are not perceived as a priority when competing with the many demands on Connecticut's tax revenues and other sources of funding. As with any other proposal to expand government programs, difficult choices must be made in allocating limited public funds.

Strategies - Funding

Strategy 8-1. Adopt a comprehensive, long term, integrated solid waste management funding system to ensure that adequate revenue is available to implement the strategies and achieve the goals of this Plan. The Agency's Solid Waste Management Advisory Committee will assume a major role in identifying appropriate funding mechanisms.

This Plan proposes a reinvigoration of Connecticut's source reduction, recycling, and composting efforts as well as new initiatives for decreasing the amount of waste disposed. Implementation of some of these strategies will involve significant changes in legislation and policy affecting the responsibilities of the DEP, regional authorities, local governments, waste haulers, waste generators, product manufacturers,

MOVING TOWARDS CONNECTICUT'S VISION: OBJECTIVES AND STRATEGIES

distributors, and retailers. A fundamental prerequisite for implementing many of the strategies is the availability of funding.

The costs of implementing this Plan will be determined by Connecticut legislators and other public and private decision makers, as they make choices regarding integrated waste management efforts in the coming years. It will be necessary to build consensus for a package of funding and incentive mechanisms, in concert with consideration of the key proposals in this Plan, in preparation for the 2007 legislative session. This effort will have the goal of securing long-term funding, as well as building support and understanding of legislators and other stakeholders sufficient to adopt the key legislative and policy proposals needed to make progress toward Connecticut's long term solid waste management vision. A significant portion of the funds generated must be directed to municipalities and recycling regions to support programs to implement the priorities in this Plan, especially to increase source reduction, recycling and composting. It is important that this funding be dedicated for solid waste management so that funds originally designated for solid waste programs are not diverted to other purposes. The following potential sources of funding have been identified that could provide some support to these programs.

- **Expand the current \$1.50 fee on waste processed at Connecticut RRFs to all disposed solid waste, including all MSW, C&D debris, and oversized MSW, whether disposed in-state or out-of-state.**

Expanding the fee to all disposed solid waste levels the playing field between in-state and out-of-state waste disposal facilities, and will generate approximately \$2 million per year in funding. Moreover, the system to implement the fee will provide data on an ongoing basis on Connecticut-generated solid waste disposed; providing measurement of progress towards the State's new waste disposal minimization objective.

- **Capture some portion of the unclaimed bottle and can deposits (escheats) to fund needed solid waste source reduction and recycling/composting programs at the state, regional, and local levels.**

Connecticut's bottle bill was implemented in 1980 and was originally designed as a litter control program. However, because the containers collected through this system were of such high quality, the bottles and cans collected attracted recycling markets and the bottle bill became a successful and effective recycling program as well as a litter control program. Estimates indicate that escheats (unclaimed deposits) in Connecticut in 2003 were approximately \$19 million. The escheats represent deposits paid but not redeemed by consumers on bottle bill beverage containers and are currently retained by the beverage industry. Since most bottle bill containers which are not redeemed become part of Connecticut's waste stream, it is appropriate that a portion of the escheats be returned to the towns or regional recycling operations to help fund their source reduction and recycling programs.

■ **Direct penalty monies from solid waste enforcement actions to municipal and regional recycling and other diversion programs.**

This Plan endorses an increase in enforcement as one important means of ensuring that recycling laws are complied with. Penalties derived through these actions are currently directed to the General Fund. Due to the nexus of these enforcement actions to the overall ability to increase the diversion rate, these penalties could be redirected to appropriately support municipal and regional programs aimed at recycling.

■ **Increase the Solid Waste Assessment beyond the present \$1.50 per ton.**

Other states assess a much higher fee on the disposal of solid waste and there is a considerable range in the types of revenue producing streams that are tied to disposal of solid waste, that in turn support their solid waste management programs. Some examples include:

- Missouri's surcharge of \$2.11 per ton of waste disposed of at sanitary and demolition landfills;
- Iowa's solid waste fee of \$4.25 per ton of waste disposed at landfills;
- Vermont's surcharge of \$6 per ton on any Vermont waste disposed either in-state or out-of-state;
- Pennsylvania's surcharge of \$7.25 per ton for waste processed at RRFs or disposed at landfills; and
- West Virginia's state and local waste assessment fee of \$8.75 per ton of waste disposed at landfills.

■ **Use State bond funds for needed infrastructure projects such as publicly controlled composting facilities and recycling facilities.**

Strategy 8-2. CT DEP will initiate discussion with the Connecticut General Assembly regarding options for funding, including directing a significant portion of any new funds to municipal and regional programs.

Strategy 8-3. CT DEP will work with the CT Department of Economic and Community Development to identify the types of economic assistance that are needed and could be provided to businesses, especially recycling, composting or other businesses that directly support the goals of the Plan.

Chapter 5

IMPLEMENTATION CONSIDERATIONS

5.1 Introduction

Connecticut's Solid Waste Management Plan is a strategic-level guidance document. It is meant to be a dynamic tool that the State, regions, and municipalities can refer to for guidance in making critical decisions about program implementation. When implementing the strategies described in Chapter Four, identifying partners, priorities and timeframes will be critical to ensuring success. A major issue that potentially will affect the way the state manages its solid waste is the potential change from public to private control of disposal capacity at four of the six Connecticut MSW RRFs. This Chapter further describes these key elements:

- **Roles and Responsibilities** – An effective management system needs to be built, and the institutional capacity must be maintained, to effectively manage solid waste at the state, regional, and local levels. Furthermore, every stakeholder has a role in implementing this Plan and will need to understand their responsibility in its implementation.
- **Public or Private Control of Waste Disposal Facilities** - Connecticut relies heavily on the six resources recovery facilities for the safe disposal of the state's municipal solid waste that is not recycled. Over the next two to fourteen years, disposal capacity at four of the facilities may shift from public to private control.
- **Priorities and Implementation Timeframes** – The relative importance of each strategy needs to be assessed given that resources will be insufficient to undertake all strategies simultaneously or to the fullest possible extent.

5.2 Roles and Responsibilities for Plan Implementation

Attainment of the vision and outcomes described in this Plan will be a long-term process. Substantial changes to current practices will be required, and commitment will be needed on the part of all stakeholders who will share in the responsibility of achieving these outcomes. Realizing Connecticut's solid waste management vision will be a function of effective management paired with sufficient organizational capacity to implement the proposed waste reduction, recycling, and solid waste management system improvements.

The components of an effective management system are as follows:

- **Ongoing communication, consensus and coordination among Connecticut agencies and other stakeholders active in solid waste reduction and management in Connecticut as well as the region** – Communication, consensus,

and coordination raise the probability of success and the level of impact, and build political support among decision makers and the legislature for future efforts. The absence of these elements will result in wasted resources. Some measure of trust and collaboration among principal stakeholders must be developed and maintained.

- **Agreement regarding the overall solid waste management goals and priorities** – It is not unusual for various entities involved in recycling and solid waste management to have different goals and expectations. Efforts need to be undertaken to build and sustain stakeholder support for the vision, goals, and strategies outlined in the Plan and the priorities most in need of attention. Goals and priorities should be periodically revised to reflect changing circumstances and needs.
- **Current, accurate market intelligence and assessment** – Good market intelligence is a function of collecting and integrating information and perspectives from a wide network of public and private sources. Up-to-date market intelligence and assessment should be used to proactively make appropriate adjustments in ongoing activities, as necessary.
- **Focused approach to strategy and program development** – A well-designed and managed statewide solid waste management system is comprised of programs and services that target key barriers and opportunities, utilizing tools that are appropriate for addressing them, and run by organizations capable of effectively utilizing the selected tools. While the programmatic and organizational structure can be fairly constant over time, program priorities and the overall strategy for using program resources should be regularly and consistently updated.
- **Effective implementation management** – Implementation management consists of program planning and budgeting, fulfillment of assigned roles and responsibilities, and coordinating actions of organizations and staff. Ideally, this involves the cost-effective allocation of financial and human resources available for solid waste management, overseen and guided by an appropriate coordinating mechanism that includes the key responsible organizations. In order for efforts to be successful, some consistency and certainty with regard to program funding is desirable.
- **Regular monitoring of the appropriateness and effectiveness of implementation efforts with provision for flexibility to adjust strategies and tools as needed** – Evaluation of their appropriateness asks if the program is aiming at the right targets. Evaluation of their effectiveness asks how well the program is achieving its targets. Evaluation is carried out for two reasons: program improvement and program justification. Improvement of solid waste management programs and services requires a systematic approach to learning about what is working, what is not working, and why. Program justification, demonstrated through impact analysis, is intended to inform program funders, participants, and target audiences about the program's value and cost effectiveness. To the extent possible, program data and information that would facilitate evaluation should be collected as part of ongoing operations.

- **Informed, enthusiastic organizations and staff** – Effective solid waste management requires an ongoing focus on building and maintaining institutional capacity for intelligent action. In particular, involved agencies and stakeholders should: keep abreast of solid waste management developments and issues, supporting staff in being proactive in identifying and responding to new information regarding barriers, opportunities, program impacts, and effective practices; hire and retain staff that are knowledgeable, flexible, adaptable, and eager to learn; and provide sufficient funding to develop and sustain the necessary staff capacity and program resources. To the extent possible, efforts should be structured so that they can continue without interruption when staff turnover does take place.

As presented in the Plan's vision statement, Connecticut will continue its progression toward a shared responsibility management approach that reflects increasing responsibility placed on the producers and generators of materials discarded as waste. All those involved in the attainment of this vision will have important roles to play, from the individual citizen to municipalities, owners and operators of solid waste facilities, waste haulers, regional solid waste programs, and state agencies. A brief discussion of roles for key partners follows.

5.2.1 Role of the U.S. EPA

On behalf of the federal government, the EPA Office of Solid Waste (OSW) regulates all solid waste under the Resource Conservation and Recovery Act (RCRA). In addition to regulating the management of solid wastes, the OSW has established the objectives as listed in the OSW Strategic Plan, many of which are also shared by Connecticut with respect to strategies outlined in this solid waste management plan, thereby indicating areas for possible joint collaboration between Connecticut and OSW. OSW has established several formal partnership programs to provide for such involvement. These include: the National Partnership for Environmental Priorities, Plug-In to e-Cycling, the Product Stewardship Initiative, and WasteWise. CT DEP as well as other public and private sectors are appropriate partners to work with OSW in these efforts. In addition, the OSW provides technical guides, educational materials, training opportunities, data gathering guidelines as well as national data, and limited grant funding to help implement programs that support its national objectives. Many of these materials and resources have beneficial applications in Connecticut and merit investigation, if not already in use. In addition, in 2002 the U.S. EPA launched the Resource Conservation Challenge (RCC) which is a national effort to conserve natural resources and energy by managing materials more efficiently by committing to: reduce waste generation; reuse and recycle more products; buy more recycled and recyclable products; and reduce toxic chemicals in waste. The program hopes to reinvigorate recycling and source reduction in the U.S. and help achieve a national recycling rate of 35 percent by 2008.

5.2.2 Role of the CT DEP

The CT DEP is the primary author and implementer of this Plan. Through the CT DEP, Connecticut works to protect public health, safety, and the environment by minimizing adverse effects from the generation, treatment, storage, disposal, and transportation of solid and hazardous wastes, hazardous substances and pesticides. The CT DEP achieves its mission by educating the public and by developing and implementing regulations, permitting and enforcement activities, policies, procedures, standards, and grant programs to administer the existing and emerging federal and state waste management laws.

5.2.3 Role of Other State Agencies

Other agencies such as the Departments of Economic and Community Development, Transportation, Administrative Services, Agriculture, Public Health, and Public Works and the Connecticut Development Authority, will be important partners in the efforts to establish new State policies and practices and develop business infrastructure, markets and processing for recycling and composting or other businesses that may help attain the goals of this Plan.

5.2.4 Role of the Agency's Solid Waste Management Advisory Committee

As identified in Chapter Four, a critical strategy of this Plan will be establishing a newly created Agency Solid Waste Management Advisory Committee. The Plan broadly outlines the function of the Advisory Committee to include their help in implementing the Plan, revising the Plan, identifying emerging issues and possible solutions. The Committee will include representative stakeholders from both the public and private sectors and hold regularly scheduled meetings that will be open to the public. As identified in this Plan, there are a number of topics and issues that the Department will work with the Advisory Committee to address. The following topics have been put forward as in need of attention: Pay-as-you-Throw, recycling market development, organics recycling, recycling and reuse of C&D waste stream, data management, and funding.

5.2.5 Role of the Connecticut Resources Recovery Authority (CRRA)

Many of the significant issues that must be dealt with under this Plan will involve CRRA, and will be affected by the role to be played by CRRA. Through passage in 1973 of the Solid Waste Management Services Act, Chapter 446e, the CRRA was created for the following purposes, including playing a significant role in the development of and revisions to this Plan.

Section 22a-262 of the General Statutes provides that "The purposes of the authority shall be:

- (1) The planning, design, construction, financing, management, ownership, operation and maintenance of solid waste disposal, volume reduction, recycling, intermediate processing and resources recovery facilities and all related solid waste reception, storage, transportation and waste-handling and general support facilities considered by the authority to be necessary, desirable, convenient or appropriate in carrying out the provisions of the state solid waste management plan and in establishing, managing and operating solid waste disposal and resources recovery systems and their component waste-processing facilities and equipment;
- (2) The provision of solid waste management services to municipalities, regions and persons within the state by receiving solid wastes at authority facilities, pursuant to contracts between the authority and such municipalities, regions and persons; the recovery of resources and resource values from such solid wastes; and the production from such services and resources recovery operations of revenues sufficient to provide for the support of the authority and its operations on a self-sustaining basis, with due allowance for the redistribution of any surplus revenues...;
- (3) The utilization, through contractual arrangements, of private industry for implementation of some or all of the requirements of the state solid waste management plan and for such other activities as may be considered necessary, desirable or convenient by the authority;
- (4) Assistance with and coordination of efforts directed toward source separation for recycling purposes; and
- (5) Assistance in the development of industries, technologies and commercial enterprises within the state of Connecticut based upon resources recovery, recycling, reuse and treatment or processing of solid waste.”

Further, Section 22a-264 gives CRRA the authority to:

- “...assist in the preparation, revision, extension or amendment of the state solid waste management plan...” ;
- “...revise and update, as may be necessary to carry out the purposes of this chapter, that portion of the state solid waste management plan defined as the “solid waste management system.”;

The CRRA was established to serve the interests of its municipal customers as described in the CRRA mission statement, revised in 2002:

“To work for – and in – the best interests of the municipalities of the State of Connecticut in developing and implementing environmentally sound solutions and best practices for solid waste disposal and recycling management on behalf of municipalities.”

Since its creation, CRRA has been focused on the provision, both directly and in partnership with others, of certain core solid waste services including the following:

- transfer station operation

- RRFs
- ash residue disposal
- recycling
- household hazardous waste collection and disposal
- education

CRRA has significantly increased its emphasis on recycling over the last few years. It has strengthened efforts to promote education at the state's two waste museums in Hartford and Stratford, and it has increased efforts to recycle more waste such as paper and electronics. This experience may position CRRA to play a more significant role in the State's efforts to meet its aggressive waste diversion goals, especially in those areas requiring new or expanded infrastructure such as additional types of paper recycling, C&D waste recycling, composting, and electronics recycling. In implementing these expanded programs, it will be important to work closely with other state agencies with business/economic development expertise and responsibilities. It is of note that CRRA has not historically exercised its authority in all areas authorized by the law. In considering this Plan and its implementation, now is an appropriate time for the executive and legislative branches of State government, the State's municipalities, and CRRA itself, to evaluate the roles that CRRA, and potentially other State or quasi-state agencies could play in implementing this Plan.

Fulfilling Connecticut's waste management needs depends heavily on a close working relationship with and between the implementing agencies and the state's municipalities. This will be critical in such areas as assistance, contracting, disposal, and other key services. There must be a strong working relationship between Connecticut's municipalities and any entity ultimately charged with assisting the towns to meet their waste management obligations. Whether directly providing waste management services and infrastructure or indirectly assisting in areas such as education and acquisition of outside contract services, trust and clear roles need to be established. Due to the fragmentation of the state's municipalities into various authorities for waste management, and the recent history of CRRA's expansion into activities beyond their traditional roles, now is the time to reconsider the roles these various authorities can serve.

5.2.6 Role of Regional Entities

Because there are 169 municipalities in Connecticut, and no county-level government, it makes sense for some solid waste management programs and planning functions to occur at the regional level, thus taking advantage of economies of scale and shared resources. Some regional efforts already exist for the following purposes:

- hold HHW collection events.
- hold electronics recycling events,
- contract for the processing of recyclable materials,

- operate specific types of solid waste management facilities for use by member jurisdictions, and
- provide recycling and other solid waste education to member municipalities

Such regional entities include operating committees and authorities. It is anticipated that State funding for the support and promotion of source reduction, recycling, and composting may be distributed to regional entities, as well as directly to municipalities whose grant requests are compatible with regional priorities and regional solid waste management plans that address goals and strategies as listed in this Plan. If a municipality wishes to undertake its own solid waste management planning initiatives consistent with the Plan, it may receive State funding.

Examples of regional planning approaches in Connecticut include regional planning agencies, regional waste authorities, and resource recovery authorities. For example, there are fifteen planning regions covering all of Connecticut for the purpose of undertaking certain regional infrastructure planning and coordination activities, such as transportation planning. Through local ordinance, the municipalities within each of these planning regions have voluntarily created one of the three types of regional planning organizations allowed under Connecticut statute (Regional Council of Elected Officials, a Regional Council of Governments, or a Regional Planning Agency) to carry out a variety of regional planning and other activities on their behalf. Some of these regional planning entities are the same entities coordinating some of the above solid waste management activities. Given that these regional planning organizations uniformly cover all municipalities in Connecticut and are already in existence to perform similar functions, with some already doing so, there is merit for these organizations to work with their member towns on solid waste management issues including source reduction, recycling, and composting. With regard to regional waste authorities such as the Housatonic Resources Recovery Authority, the Southeastern Connecticut Regional Resources Recovery Authority, and Bristol Resources Recovery Facility Operating Committee/Tunxis Recycling Operation Committee, there is a good foundation and great opportunity to manage solid waste on a regional level.

5.2.7 Role of Municipalities

Municipalities play one of the most important roles of all in the implementation of this Plan. By Connecticut State Statute Chapter 446d, Sec.22a-220, municipalities or municipal authorities in Connecticut shall provide for the safe and sanitary disposal of all solid waste generated within their boundaries. Municipalities must also make provisions for recycling of mandated items. In Connecticut, municipalities can designate the area where solid waste generated within its boundaries by residential, business, commercial, or other establishments shall be disposed. Municipalities can also designate where certain residential recyclables shall be taken for processing. Municipalities are responsible for submitting annual recycling reports to the CT DEP, are required to have designated a recycling contact person, are required to have adopted local recycling ordinances and have the authority and responsibility of enforcing those ordinances. With regard to the programs directed at individuals, the

vast majority of work is done at the local level, and the same is true for the expanded efforts called for in this Plan.

5.2.8 Role of Private Sector, Including Product Manufacturers

Private industry is heavily involved in a broad range of efforts in solid waste management, from the manufacturing and retail end to the companies that collect, process, recycle, transport, and dispose of the waste. The waste management industry must bring its unique expertise to develop ways of making the collection, transport, and disposal of waste materials more efficient with less environmental impact. It must also accept the new mandates and requirements that will be created to allow waste diversion from disposal to become the primary management method of achieving these goals. The private sector waste industry may need to fill gaps in capacity for disposal and management of waste.

Product manufacturers and other companies in the supply chain such as suppliers, distributors, and retailers share responsibility for achieving waste management objectives involving their products. These companies are responsible for designing and marketing products and packaging, and as such, their role includes considering recyclability, waste generation and toxicity in product design, and facilitating recycling by accepting a degree of financial or physical responsibility for achieving goals. They must continue to form industry partnerships to collaborate with their competitors in finding solutions to the tough problems identified in this Plan. In addition, a large part of the success in implementing this plan will depend on both existing industries stepping up to do more to recycle their waste materials, and new industries forming to take advantage of the new opportunities and incentives that will be created. This Plan envisions that this shift towards a shared responsibility framework will continue to occur gradually, through the multi-state product stewardship initiatives sponsored by such organizations as the Northeast Recycling Council and the Product Stewardship Institute. Connecticut is a member of both organizations. The shift will also occur through in-state legislative and policy approaches as appropriate, and this Plan identifies several areas involving funding and recycling policies, for example, those targeting electronics, construction waste recycling, food waste composting, beverage containers, and other products.

5.2.9 Role of Residents, Consumers, and Commercial Waste Generators

Finally, the focus of all of these efforts comes down to the individual citizen, all of us. We will all be expected to share in the responsibility of making this Plan work. Accepting that responsibility will come in many forms: changing our recycling practices at home and at work, composting at home, buying things that create less waste, and, perhaps most importantly, accepting the costs of implementing these programs. Residents and commercial waste generators have an obligation to separate mandated recyclable materials, per CGS 22a-241b, and to manage their waste to be disposed properly and legally. This Plan asserts that it is also appropriate for residents and businesses, as consumers of materials and generators of waste, to take some

financial responsibility for the end-of-life management for goods and packaging from goods that they consume. This Plan encourages implementation of Pay-as-You-Throw programs that charge waste generators for waste disposal services based on the quantity of waste disposed.

5.3 Public or Private Control of Waste Disposal Facilities

Major changes are possible over the next several years regarding the ownership, operation and contracting for disposal services provided by most of the resources recovery facilities. The complicated financing, construction, and operating agreements that were put in place when the RRFs were constructed include provisions for transfer of ownership and control of capacity to the private sector within the next two to fourteen years at four of the six CT MSW RRFs, unless state or local governments exercise certain options to retain or obtain ownership.

The pertinent time frames for these changes to take place are as follows: Bridgeport RRF in 2008; Preston RRF in 2015; Bristol RRF, any time prior to 2015; and Wallingford RRF, any time prior to 2010. A more detailed explanation of this situation was provided by CRRA, the Bristol Resources Recovery Facility Operating Committee, Wheelabrator Connecticut, and Covanta Energy Inc., and is found in Appendix K. The following summarizes the status of each of the RRFs on this issue:

Bridgeport RRF

- Operating contract with Wheelabrator expires 12/31/08.
- Final repayment of project bonds 12/31/08.
- Owner trustee has option to purchase facility for \$1.00 at contract expiration.

Bristol RRF

- Owned by Covanta now; operated by Covanta.
- Contract expires in 2014.
- At any time, member towns have an option to buy the facility for fair market value.
- Covanta could sell the facility to another party if the member towns don't want it.
- CRRA has no role, other than as a potential buyer if the member towns don't want to buy.

Hartford (Mid CT) RRF

- Owned and controlled by CRRA.
- Operated by Covanta and MDC; operating contracts will expire in 2015.
- Ownership will remain with CRRA post-contract expiration.

Lisbon RRF

- Owned by the Eastern CT Resource Recovery Authority (ECRRA) with the sole member being the City of Middletown.
- Wheelabrator has an operating agreement with ECRRA with no ownership interest.
- The municipal bonds will be paid in 2020.
- When the bonds are paid, the facility will be owned by ECRRA.

Preston RRF

- Owned by CRRA; operated by Covanta.
- Operating contract expires 11/30/15, at which time Covanta can purchase the facility for \$1.00.
- CRRA has option to buy at fair market value ten years after the conclusion of the initial contract, or in 2025.

Wallingford RRF

- Owned by CRRA; operated by Covanta.
- Operating contracts expire 6/30/10, w/ options to extend by Covanta or CRRA.
- Prior to 1/31/10, Covanta has option to purchase for \$1.00, or CRRA can purchase at fair market value.

While the ultimate outcome is uncertain, by 2015, with the exception of CRRA's Mid-CT facility and ECRRA's Lisbon RRF, the other Connecticut Resource Recovery Authority's facilities' disposal capacity could be in private control. Some stakeholders have raised concerns regarding this transfer of ownership, and many in the solid waste arena have suggested that the State take proactive steps to retain public ownership of the RRFs. This Plan does not take a position on this issue, other than to make clear that it is an important issue that should be fully understood and debated by the public and local and State officials so appropriate steps can be taken if necessary. To retain public control of these facilities will require significant public expenditures, but these may be expenditures that are appropriate so that there is greater control over disposal options.

The General Assembly has recently taken action in recognizing some of these issues. In 2003, Section 22a-268f of the General Statutes was adopted requiring CRRA to evaluate options for disposal of solid waste in a timely fashion. This statute requires that, no later than two years prior to the final maturity date of bonds for any resources recovery project, CRRA must form a committee, made up of representatives of CRRA and the municipalities using the facility, and do a study of options for solid waste disposal from those municipalities. It is critical that these studies be performed so the State, CRRA, and the municipalities can make informed decisions regarding solid waste disposal after the present contracts expire.

5.4 Priorities, Estimated Costs, and Timeframes

This Plan proposes numerous strategies for achieving the State's long-term solid waste management goals. For planning purposes, as well as the prudent use of resources, it is essential that priorities among the Plan's strategies be established. The relative importance of each strategy needs to be assessed given that resources will be insufficient to undertake all strategies simultaneously or to the fullest possible extent. In addition, strategies need to be mapped chronologically so that all parties involved have a sense of when they are to be undertaken. These priorities were established based on consideration of the following criteria:

- The importance of the strategy in bringing Connecticut closer to its solid waste vision and goals;
- The ease of implementation and institutional feasibility of the strategy;
- The costs and cost-effectiveness of the strategy relative to the resources available; and
- The extent to which other strategies are dependent upon the strategy.

Table 5-1 presents an annotated list of recommended strategies for solid waste management in Connecticut. The Table identifies for each of the seventy-five strategies, the following: the type of action needed; the assigned priority; new costs; initiation time frame; and the lead and/or key partners for implementation. Of the total number of strategies, forty-five are high priority; twenty-two are medium priority; and eight are low priority. The CT DEP will, in conjunction with the Agency Solid Waste Management Advisory Committee, be preparing an operational work plan that will target those high priority strategies and will further refine associated implementation costs. Many of the high priority strategies are focused on attaining a much higher diversion rate for MSW disposal. Diversion includes reducing MSW at the source, recycling or composting. As discussed in the Plan, the greatest opportunity for increasing diversion rates is to develop new programs for materials that have very low diversion rates at present, while enhancing, improving and maintaining existing source reduction, composting and recycling programs.

Based on available information and best professional judgment, cost estimates have been prepared for those high priority strategies found in Table 5-1. Assuming that the focus of the efforts will be directed towards:

- Enhancing and improving the existing municipal recycling programs;
- Targeting certain waste streams, such as: the recycling of electronics, mixed paper, and commercial C&D wastes; and the composting of commercial food waste.
- Promoting and developing options for Pay as you Throw (PAYT) programs or unit pricing throughout Connecticut for MSW;
- Enhancing and improving the state's solid waste management database system;
- Conducting a waste characterization study; and
- Improving permitting and enforcement activities.

Program costs under each of these efforts may include staffing and education, collection and processing infrastructure and other related costs. Much of the responsibility for implementing these efforts will involve multiple partners, including the CT DEP and other state agencies, regional waste authorities, municipalities, private haulers, processors, environmental groups, and private citizens. It is expected that in the first 12 to 18 months, the need for new resources necessary for administration, planning and coordination, and start-up activities would be evenly divided between state and regional/municipal partners. From year two forward, resource allocations would favor regional/municipal partners in ratios of 3 to 1, to as much as 5 to 1. The estimated costs for the first five years of implementation, targeting high priority strategies, are estimated to be approximately 28 million dollars ranging from 4.5 million dollars the first year to about 7 million dollars in the peak second and third years. As programs become established, some programs are expected to become self-sustaining through user fees and, in addition, the annual costs level off again in the 4.5 million dollar range.

Of the estimated costs, a combination of funding mechanisms may be appropriate and could include: an on-going general fund line item appropriation; bonding; and fee based programs. As indicated throughout the Plan, a large portion of the work will be undertaken at the regional and municipal level and the allocation of resources would necessarily follow this level of effort. Refinement of these cost estimates will need to follow the development of more detailed action plans and will require a great deal of additional discussion with stakeholders. The State Solid Waste Management Plan provides the foundation for the work that must be done to best manage our solid waste in a social, economic and environmentally responsible manner.

**Table 5-1
Annotated List of Recommended Strategies for Solid Waste Management in Connecticut**

Strategy Number	Recommended Strategy	Type of Action	Priority	New Costs ⁽¹⁾	Initiation Time Frame ⁽²⁾	Responsibility Lead/ Key Partners ⁽³⁾
Objective 1	Source Reduction					
1-1	Continue to implement the CT DEP's Pollution Prevention Plan that establishes goals and identifies strategies to reduce the quantity and toxicity of wastes discharged to the land, air, and waters of the state.	Administrative	Medium	Staff = \$	Existing	DEP
1-2	Educate consumers and businesses about the effects of their purchasing choices and behaviors on waste generation, and provide education and incentives to help change purchasing and behavioral practices to reduce the amount and toxicity of waste produced.	Administrative	High	Staff = \$\$ Other = \$\$	Short term	DEP
1-3	Continue to support regional and national efforts to change manufacturer practices to produce products that generate less waste and less toxic waste.	Administrative	Medium	Staff = \$	Existing	DEP
1-4	Continue to promote environmentally preferable purchasing ("EPP") standards in state and local government; encourage state agencies and municipalities to become members of EPA's WasteWise Program; and support green design standards and encourage their adoption by Connecticut local governments and institutions.	Administrative	High	Staff = \$	Existing	DAS/ DEP & municipalities
1-5	Provide funding to promote reuse and publicize product reuse opportunities.	Legislative, Administrative	Medium	Other = \$	Short term	TBD
1-6	Promote through such activities as technical assistance, start-up funding, and/or other incentives, the implementation of effective pay-as-you-throw (PAYT) pricing systems by municipalities and haulers for managing solid waste from residents and small businesses to achieve waste reduction.	Administrative	High	Staff = \$\$ Other = \$\$	Mid term	TBD/ Municipalities & Regional

(1) Costs estimates include start up & on-going implementation: \$ = ~ 1Fte or < \$100,000; \$\$ = 2-5 Ftes or \$100,000 to \$500,000; \$\$\$ = >5 ftes or > \$500,000; Other costs include capital costs, grants, consulting fees, etc

(2) Existing; Short term = 2006-2008; Mid term = 2008-2010; Long term after 2010

(3) Lead will be responsible for initiating action; Key Partners may be responsible for implementation

IMPLEMENTATION CONSIDERATIONS

**Table 5-1
Annotated List of Recommended Strategies for Solid Waste Management in Connecticut**

Strategy Number	Recommended Strategy	Type of Action	Priority	New Costs ⁽¹⁾	Initiation Time Frame ⁽²⁾	Responsibility Lead/ Key Partners ⁽³⁾
1-7	Seek partnerships, provide funding, and coordinate a model source reduction program to reduce the amount and toxicity of solid waste generated in at least one Connecticut community.	Administrative	Low- Medium	Staff = \$ Other = TBD	Mid term	DEP/ Municipalities and others TBD
1-8	Continue to enforce Connecticut's Toxics in Packaging Act and other toxic reduction programs and efforts. Continue to work in conjunction with the Toxics in Packaging Clearing House and other member states to assess compliance rates with toxics in packaging laws.	Administrative	Medium	Minimal	Existing	DEP/ Regional
Objective 2	Recycling and Composting					
2-1	Update Connecticut's beverage container deposit system by increasing the deposit amount and expanding coverage to at least plastic water bottles.	Legislative	High	Staff = \$ Other = \$\$\$	Short term	DEP/ Private sector
2-2	Add plastics PET #1 and HDPE #2 and magazines to the list of State mandated recyclables.	Legislative	High	Staff = \$ Other = \$\$	Short term	DEP/ Municipal & private sector
2-3	Continue to support Environmentally Preferable Purchasing (EPP) at CT DAS and promote and ensure state agencies and political subdivision utilization of EPP standards. CT DEP and CT DAS will evaluate the relevant statutes to ensure their completeness and effectiveness in actual State purchasing practices.	Administrative	High	Minimal	Short term	DAS/ DEP & municipal
2-4	Through the Agency's Solid Waste Management Advisory Committee identify incentives for municipalities and haulers to implement effective PAYT pricing systems for managing solid waste from residents and small businesses to achieve waste reduction. (See 6.3)	Administrative	High	Minimal	Mid term	DEP/ Multi-stakeholder committee

(1) Costs estimates include start up and on-going implementation: \$ = ~ 1Fte or < \$100,000; \$\$ = 2-5 Ftes or \$100,000 to \$500,000; \$\$\$ = >5 ftes or > \$500,000

(2) Lead will be responsible for initiating action, Key Partners may be responsible for implementation

(3) Other costs include capital costs, grants, consulting fees, etc.

IMPLEMENTATION CONSIDERATIONS

**Table 5-1
Annotated List of Recommended Strategies for Solid Waste Management in Connecticut**

Strategy Number	Recommended Strategy	Type of Action	Priority	New Costs ⁽¹⁾	Initiation Time Frame ⁽²⁾	Responsibility Lead/ Key Partners ⁽³⁾
2-5	Increase technical assistance, education, outreach, and enforcement with regard to the business and industry sectors (especially the small businesses) and institutions to decrease their waste disposal rates by increasing recycling and source reduction. Promote EPP, including recycled content products, by Connecticut's businesses, industries, and institutions.	Administrative, Regulatory	High	Staff = \$\$ Other = \$\$	Short term	DEP/ Municipal, regional and others TBD
2-6	Continue the CT DEP's Municipal Recycling Honor Roll Awards Program and the Green Circle Awards Program to recognize and support exemplary source reduction and recycling practices and promote technology transfer.	Administrative	Medium	Minimal	Existing	DEP
2-7	CT DEP, in collaboration with regional authorities and the hauling industry, will identify incentives for haulers to increase the amount of material recovered for recycling.	Administrative	Medium	Staff = minimal Other = \$ - \$\$	Mid term	DEP/ Private, Regional
2-8	Develop the infrastructure necessary to increase the amount of paper that is recycled. Create incentives and funding for increased paper recycling and for source reducing the amount of waste paper generated.	Administrative	Medium	Staff = \$ Other = \$	Mid term	TBD/ Regional, Private
2-9	Support the continued recycling of non-mandated recyclables.	Administrative	Low	Minimal	Existing	Municipal & Regional
2-10	CT DEP, the Agency's Solid Waste Management Advisory Committee and other State Agencies will work with recycling business representatives to facilitate the development, expansion, and creation of markets for recycled materials.	Administrative	Low – Medium	Staff = \$ Other = \$\$	Mid term	DEP/ other state agencies TBD
2-11	Build local, regional, and state capacity for implementing State recycling policies, regional planning and program implementation, and recycling information sharing.	Administrative	High	Staff = \$\$\$	Short term	TBD/ DEP, Municipal, Regional, & others

(1) Costs estimates include start up and on-going implementation: \$ = ~ 1Fte or < \$100,000; \$\$ = 2-5 Ftes or \$100,000 to \$500,000; \$\$\$ = >5 ftes or > \$500,000

(2) Lead will be responsible for initiating action, Key Partners may be responsible for implementation

(3) Other costs include capital costs, grants, consulting fees, etc.

IMPLEMENTATION CONSIDERATIONS

**Table 5-1
Annotated List of Recommended Strategies for Solid Waste Management in Connecticut**

Strategy Number	Recommended Strategy	Type of Action	Priority	New Costs ⁽¹⁾	Initiation Time Frame ⁽²⁾	Responsibility Lead/ Key Partners ⁽³⁾
2-12	CT DEP and regional recycling entities will work to build partnerships with groups that can assist with and support the State's recycling efforts. Potential partners include regional recycling programs, municipalities, CRRA, trade associations, non-governmental organizations, universities and others.	Administrative	Medium	Staff = \$	Mid term	DEP/ Regional & other stakeholders
2-13	CT DEP will designate a "State Source Reduction and Recycling Coordinator" to coordinate and implement the strategies described in this section and other sections of the Plan to increase source reduction, recycling, and composting.	Administrative	High	Staff = \$	Short term	DEP
2-14	Identify the internal barriers and solutions to streamlining the permitting process for source separated organic material recycling, especially for those institutional, commercial, and industrial operations that process food scraps, soiled paper and waxed cardboard.	Administrative	High	Staff = \$	Mid term	DEP/ Private
2-15	The Agency's Solid Waste Management Advisory Committee will be requested to discuss options that could stimulate organics recycling, especially food scraps, soiled paper, and waxed cardboard from the institutional, commercial and industrial sectors.	Administrative	High	Minimal	Short term	DEP/ Stakeholders
2-16	Include compost and compostable materials in a statewide or regional on-line materials exchange to link generators of source separated organic material with processors and compost users.	Administrative	Low	Staff = \$ Other = \$	Mid term	TBD/ Private
2-17	Encourage the marketing of compost products for such uses as erosion control, potting soil blends, topsoil blends, playing field mediums, etc.	Administrative	Low	Minimal	Mid term/ existing	TBD/ Stakeholders
2-18	Promote home composting and grasscycling.	Administrative	Medium	Other = \$-\$\$	Mid term	DEP/ Municipal

(1) Costs estimates include start up and on-going implementation: \$ = ~ 1Fte or < \$100,000; \$\$ = 2-5 Ftes or \$100,000 to \$500,000; \$\$\$ = >5 ftes or > \$500,000

(2) Lead will be responsible for initiating action, Key Partners may be responsible for implementation

(3) Other costs include capital costs, grants, consulting fees, etc.

IMPLEMENTATION CONSIDERATIONS

**Table 5-1
Annotated List of Recommended Strategies for Solid Waste Management in Connecticut**

Strategy Number	Recommended Strategy	Type of Action	Priority	New Costs ⁽¹⁾	Initiation Time Frame ⁽²⁾	Responsibility Lead/ Key Partners ⁽³⁾
Objective 3	Management of Solid Waste Requiring Disposal					
3-1	Minimize the need for additional capacity for disposal of MSW, MSW RRF ash residue and C&D waste through aggressive implementation of the source reduction, recycling, composting, and other initiatives in this Plan. This Plan establishes a target of achieving a 58 percent MSW disposal diversion rate by FY2024.	All types	High	\$\$\$	Short term	All partners
3-2	The State will monitor waste generation and capacity on a regular basis, and with input from the Agency's Solid Waste Management Advisory Committee, evaluate the need for additional MSW, MSW RRF ash residue and C&D waste disposal capacity.	Administrative	High	Staff = \$	Mid term	DEP
3-3	The Department will seek legislative authorization to require any applicant for new RRF or landfill capacity, at the time any application is submitted to the CT DEP, to create a fund to be accessed by the host municipality to: (1) fund a local advisory committee and (2) hire appropriate expertise to assist the host municipality in reviewing the application and taking part in the application process. The local advisory committee should include elected officials and residents from both the host community and contiguous communities.	Legislative, Administrative	High	Staff = \$ Other = \$\$	Short term	DEP/ Applicants and stakeholders
3-4	Require C&D waste to be processed to the greatest extent practicable prior to its disposal at any solid waste facility.	Legislative, Administrative	High	Staff = \$ Other = \$\$\$	Short term	DEP/ Private sector
3-5	Research and track new solid waste management technologies that have the potential to reduce environmental impacts and maximize benefits.	Administrative	Low	Minimal	Long term	TBD

(1) Costs estimates include start up and on-going implementation: \$ = ~ 1Fte or < \$100,000; \$\$ = 2-5 Ftes or \$100,000 to \$500,000; \$\$\$ = >5 ftes or > \$500,000

(2) Lead will be responsible for initiating action, Key Partners may be responsible for implementation

(3) Other costs include capital costs, grants, consulting fees, etc.

**Table 5-1
Annotated List of Recommended Strategies for Solid Waste Management in Connecticut**

Strategy Number	Recommended Strategy	Type of Action	Priority	New Costs ⁽¹⁾	Initiation Time Frame ⁽²⁾	Responsibility Lead/ Key Partners ⁽³⁾
Objective 4	Management of Special Waste and Other Types of Waste					
4-1	The Agency Solid Waste Management Advisory Committee will be requested to discuss and identify opportunities to reuse and recycle building related C&D waste.	Administrative	High	Staff = \$	Short term	DEP/ Private
4-2	Revise the statutory and regulatory definitions of solid wastes and solid waste categories to more accurately reflect the character and management of these wastes.	Legislative, Regulatory	Medium	Staff = \$	Mid term	DEP
4-3	Manage building related C&D waste that cannot be reduced, reused, recycled, or composted, in a manner that ensures protection of land, air, and water resources and the public health, in compliance with the state hierarchy for managing solid waste.	Administrative, Regulatory	High	Staff = \$ Other = \$\$\$	Mid term	DEP/ Private & other stakeholders
4-4	Support reuse and recycling of highway/road C&D waste, and dispose of that portion that cannot be reduced, reused, recycled, or composted, in a manner that ensures protection of land, air, and water resources and the public health in compliance with the state hierarchy for managing solid waste.	Administrative	Medium	Minimal	Existing	DEP/ DOT, Municipal
4-5	Increase the recycling, composting, and beneficial use of land clearing debris.	Administrative	Medium	Staff = \$ Other = \$\$	Mid term	DEP/ Private, Municipal, private sector
4-6	Increase the reuse and recycling of oversized MSW.	Administrative	Low	TBD	Long term	DEP/ Regional, and other partners
4-7	Manage oversized MSW that cannot be reused or recycled in a manner that ensures protection of land, air, and water resources and the public health in compliance with the state hierarchy for managing solid waste.	Administrative, Regulatory	High	Staff = \$ Other = \$\$\$	Mid term	TBD

(1) Costs estimates include start up and on-going implementation: \$ = ~ 1Fte or < \$100,000; \$\$ = 2-5 Ftes or \$100,000 to \$500,000; \$\$\$ = >5 ftes or > \$500,000

(2) Lead will be responsible for initiating action, Key Partners may be responsible for implementation

(3) Other costs include capital costs, grants, consulting fees, etc.

IMPLEMENTATION CONSIDERATIONS

**Table 5-1
Annotated List of Recommended Strategies for Solid Waste Management in Connecticut**

Strategy Number	Recommended Strategy	Type of Action	Priority	New Costs ⁽¹⁾	Initiation Time Frame ⁽²⁾	Responsibility Lead/ Key Partners ⁽³⁾
4-8	Seek legislation that provides for recycling of electronic wastes based on a producer responsibility model.	Legislative	High	Staff = \$ Other = TBD	Short term	DEP/ private stakeholders
4-9	Enhance the statewide Household Hazardous Waste Program.	Administrative	Low	Staff = min. Other = \$\$\$	Long term	DEP/ municipal
4-10	CT DEP will continue to monitor and research management options for other types of special wastes that have not been adequately addressed to date, or as problems and the need arises, and as resources allow. Types of wastes that need to be addressed include: animal mortalities; road wastes; dredge material from Long Island Sound; contaminated soils; sewage sludge; water treatment residual solids; preservative treated wood; sharps and waste pharmaceuticals; disaster debris; and other materials as appropriate.	Administrative	Low - high	TBD	Short term – Long term	DEP/ Others
Objective 5	Education and Outreach					
5-1	Undertake education and outreach actions using minimal additional resources. Such actions could include: coordinating existing resources and sharing information; enhancing the CT DEP website; promoting awareness through recognition programs; integrating solid waste issues with other environmental issues; ongoing outreach to media; and encouraging municipalities to provide solid waste and recycling information to residents and businesses.	Administrative	High	Staff = min. Other = \$	Short term	DEP/ Municipal and others TBD
5-2	Undertake education and outreach actions using additional resources. These actions can include: providing comprehensive assistance to regional and local outreach programs; developing partnerships; and assessing and modifying outreach programs on a two year basis.	Administrative	High	Staff = \$ Other = \$\$	Mid term	DEP/ Municipal and others TBD

(1) Costs estimates include start up and on-going implementation: \$ = ~ 1Fte or < \$100,000; \$\$ = 2-5 Ftes or \$100,000 to \$500,000; \$\$\$ = >5 ftes or > \$500,000

(2) Lead will be responsible for initiating action, Key Partners may be responsible for implementation

(3) Other costs include capital costs, grants, consulting fees, etc.

**Table 5-1
Annotated List of Recommended Strategies for Solid Waste Management in Connecticut**

Strategy Number	Recommended Strategy	Type of Action	Priority	New Costs ⁽¹⁾	Initiation Time Frame ⁽²⁾	Responsibility Lead/ Key Partners ⁽³⁾
5-3	Undertake education and outreach actions using expanded resources. These actions can include: researching and developing effective outreach approaches; disseminating new educational and outreach materials; developing an independent recycling web site that acts as a clearinghouse and listserv for municipal and regional recycling coordinators; and developing education and technical assistance for targeted sectors.	Administrative	High	Staff = \$\$ Other = \$\$\$	Long term	DEP/ Municipal and others TBD
Objective 6	Program Planning, Evaluation, and Measurement					
6-1	Establish per capita waste disposal minimization goals for MSW and C&D/oversized MSW.	Administrative	High	Minimal	Short term	DEP
6-2	Minimize the reporting burden for municipalities and others by only requiring the collection of data necessary to support the goals of the Plan and provide the information needed for on-going solid waste management planning and evaluation.	Administrative, Regulatory	High	Staff = \$ Other = \$\$	Mid term	DEP/ Municipal
6-3	Establish a standing Agency Solid Waste Management Advisory Committee of affected stakeholders to help implement the new State Solid Waste Management Plan, revise the Plan, identify emerging issues, and find solutions.	Administrative	High	Staff = \$	Short term	DEP
6-4	Implement an iterative planning process for the State's Solid Waste Management Plan to allow revisions on a more frequent and as needed basis, following a management system model of Plan/Do/Check/Act. A strong on-going stakeholder process, local and regional planning, and an improved methodology for measuring success will inform the planning cycle.	Administrative	High	Staff = \$	Short term	DEP/ Stakeholders

(1) Costs estimates include start up and on-going implementation: \$ = ~ 1Fte or < \$100,000; \$\$ = 2-5 Ftes or \$100,000 to \$500,000; \$\$\$ = >5 ftes or > \$500,000

(2) Lead will be responsible for initiating action, Key Partners may be responsible for implementation

(3) Other costs include capital costs, grants, consulting fees, etc.

**Table 5-1
Annotated List of Recommended Strategies for Solid Waste Management in Connecticut**

Strategy Number	Recommended Strategy	Type of Action	Priority	New Costs ⁽¹⁾	Initiation Time Frame ⁽²⁾	Responsibility Lead/ Key Partners ⁽³⁾
6-5	Evaluate and make recommendations for changes to underlying legal authorities to improve state, regional, and local solid waste planning and coordination. Develop system performance benchmarks relevant at both the state and local levels aimed at achieving a unified solid waste management vision. Explore opportunities to fund planning activities at the state, regional, and local level and develop incentives for full participation.	Administrative	High	Staff = \$\$ Other = \$\$	Mid term	DEP/ Stakeholders
6-6	Provide training and informational materials to municipal officials, regional and local waste management and recycling staff regarding best practices and strategies for strengthening solid waste and recycling programs. Encourage communities and regional recycling programs to share their best practices and strategies. Investigate the possibility of established a municipal solid waste/recycling mentor program.	Administrative	High	Staff = \$ Other = \$	Short term	DEP/ Municipal
6-7	The CT DEP will conduct a solid waste characterization study.	Administrative	High	Other = \$\$	Short term	DEP/Stakeholders
Objective 7	Permitting and Enforcement					
7-1	CT DEP will make the permitting of solid waste facilities that increase waste diversion from disposal a priority.	Administrative	High	Minimal	Short term	DEP
7-2	CT DEP will designate a permitting team whose responsibility is to review all solid waste diversion applications and to make determinations in a timely manner.	Administrative	High	Minimal	Short term	DEP
7-3	CT DEP will facilitate the permitting process by developing model permits and fact sheets for applicants and interested parties, so that the process and the applicant's obligations are well defined and readily comprehensible.	Administrative	Medium	Staff = \$ - \$\$	Mid term	DEP
7-4	CT DEP will establish target time frames for acting on solid waste diversion and beneficial use applications.	Administrative	Low	Minimal	Mid term	DEP

(1) Costs estimates include start up and on-going implementation: \$ = ~ 1Fte or < \$100,000; \$\$ = 2-5 Ftes or \$100,000 to \$500,000; \$\$\$ = >5 ftes or > \$500,000

(2) Lead will be responsible for initiating action, Key Partners may be responsible for implementation

(3) Other costs include capital costs, grants, consulting fees, etc.

**Table 5-1
Annotated List of Recommended Strategies for Solid Waste Management in Connecticut**

Strategy Number	Recommended Strategy	Type of Action	Priority	New Costs ⁽¹⁾	Initiation Time Frame ⁽²⁾	Responsibility Lead/ Key Partners ⁽³⁾
7-5	CT DEP will conduct a comprehensive assessment of the state statutes and regulations as they relate to solid waste management and to the implementation of the State Solid Waste Management Plan. In its review, the CT DEP should take into account broader environmental concerns, such as air and water issues.	Administrative, Legislative, Regulatory	High	Staff= \$ Other = 0	Short term	DEP
7-6	CT DEP will streamline the beneficial use process, with consideration given to an exemption from permitting for certain types of materials.	Administrative, Legislative, Regulatory	High	Staff = \$	Short term	DEP/ Stakeholders
7-7	CT DEP will establish a streamlined method of regulating waste haulers in order to incorporate reporting and other substantive requirements, along with a simple means of assessing the solid waste fee. Any action taken by the CT DEP will be consistent with the Governor's Task Force Report recommendations that are carried forward.	Legislative, Regulatory	High	Staff = \$ Other = \$\$	Short term	DEP/ Stakeholders
7-8	CT DEP will seek authority to establish categories of demonstration projects that would not require traditional permitting.	Legislative, Regulatory	Medium	Staff = \$	Mid term	DEP
7-9	CT DEP will continue to identify activities appropriate for approval by general permit, and devote staff resources to this effort.	Administrative	Medium	Staff = \$	Existing	DEP
7-10	CT DEP will develop a procedure to allow the modification of existing permit approvals in order to facilitate improved or modified business operations and enhanced protection of the environment that are needed due to evolving technologies, markets conditions, and environmental concerns.	Administrative, Regulatory	Medium	Staff = \$	Mid term	DEP

(1) Costs estimates include start up and on-going implementation: \$ = ~ 1Fte or < \$100,000; \$\$ = 2-5 Ftes or \$100,000 to \$500,000; \$\$\$ = >5 ftes or > \$500,000

(2) Lead will be responsible for initiating action, Key Partners may be responsible for implementation

(3) Other costs include capital costs, grants, consulting fees, etc.

IMPLEMENTATION CONSIDERATIONS

**Table 5-1
Annotated List of Recommended Strategies for Solid Waste Management in Connecticut**

Strategy Number	Recommended Strategy	Type of Action	Priority	New Costs ⁽¹⁾	Initiation Time Frame ⁽²⁾	Responsibility Lead/ Key Partners ⁽³⁾
7-11	CT DEP will seek amendments to CGS Section 22a-208a(d) to allow municipal transfer stations to accept and do minimal separation of residentially generated construction and demolition waste without requiring full permit modifications and fees.	Legislative, Regulatory	Medium	Staff = \$	Short term	DEP
7-12	CT DEP will establish criteria for C&D waste Volume Reduction Facilities to help ensure that more of this waste stream is diverted from disposal.	Administrative	Medium	TBD	Mid term	DEP
7-13	CT DEP will seek and encourage public input at the appropriate steps with regard to the development of General Permits for certain activities and Beneficial Use General Permits.	Other	High	Minimal	Short term	DEP
7-14	CT DEP will consider host community agreements as part of the re-writing of the solid waste regulations. Until such time regulations are adopted, host community agreements shall be encouraged on a case-by-case basis.	Administrative, Regulatory	High	Minimal	Short term	DEP
7-15	CT DEP will continue to evaluate the environmental impacts of the alternatives for solid waste disposal and will examine its authority to require an applicant for new capacity and disposal to provide detailed information on such impacts.	Administrative	High	Minimal	Short term	DEP/private sector
7-16	CT DEP will increase its compliance outreach efforts to develop a more comprehensive and mutually supportive network of communications with land use, public works, and other municipal officials who are directly involved in solid waste activities. CT DEP will take appropriate actions to ensure compliance.	Administrative	High	Staff = \$-\$\$	Short term	DEP/ Municipal and others
7-17	CT DEP will take enforcement actions against recycling law violators as necessary to ensure compliance.	Administrative	High	Staff = \$ Other = \$\$	Existing	DEP/ Municipal and others

(1) Costs estimates include start up and on-going implementation: \$ = ~ 1Fte or < \$100,000; \$\$ = 2-5 Ftes or \$100,000 to \$500,000; \$\$\$ = >5 ftes or > \$500,000

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**Table 5-1
Annotated List of Recommended Strategies for Solid Waste Management in Connecticut**

Strategy Number	Recommended Strategy	Type of Action	Priority	New Costs ⁽¹⁾	Initiation Time Frame ⁽²⁾	Responsibility Lead/ Key Partners ⁽³⁾
7-18	CT DEP will evaluate incentives that would encourage municipalities to take on enforcement responsibilities they are already authorized to do.	Administrative	High	Staff = \$	Short term	DEP/ Municipal
7-19	CT DEP will establish civil penalty regulations for violations of recycling laws.	Regulatory	Medium	Staff = \$	Short term	DEP
7-20	CT DEP will evaluate additional tools for taking enforcement actions against violators of the solid waste statutes, regulations, and permits.	Administrative	Medium	TBD	Mid term	DEP/ Stakeholders
7-21	CT DEP will ensure that RRF's and other solid waste facilities including landfills and transfer stations comply with CGS Section 22a-220c(b) which requires solid waste facilities periodically to inspect loads delivered to them for significant quantities of recyclables and report such violation back to the municipalities.	Administrative	High	Staff = \$\$	Mid term	DEP/ Municipal, Authorities, & Private sector
Objective 8	Funding					
8-1	Adopt a comprehensive, long term, integrated solid waste management funding system to ensure that adequate revenue is available to implement the strategies and achieve the goals of this Plan. The Agency's Solid Waste Management Advisory Committee will assume a major role in identifying appropriate funding mechanisms.	Legislative	High	\$\$\$	Short term	DEP/ OPM, Stakeholders
8-1(1)	Expand the current \$1.50 fee on waste processed at Connecticut RRFs to all disposed solid waste, including all MSW, C&D debris, and oversized MSW, whether disposed in-state or out-of-state.					

(1) Costs estimates include start up and on-going implementation: \$ = ~ 1Fte or < \$100,000; \$\$ = 2-5 Ftes or \$100,000 to \$500,000; \$\$\$ = >5 ftes or > \$500,000

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**Table 5-1
Annotated List of Recommended Strategies for Solid Waste Management in Connecticut**

Strategy Number	Recommended Strategy	Type of Action	Priority	New Costs ⁽¹⁾	Initiation Time Frame ⁽²⁾	Responsibility Lead/ Key Partners ⁽³⁾
8-1(2)	Capture some portion of the unclaimed bottle and can deposits (escheats) to fund needed solid waste source reduction and recycling/composting programs at the state, regional, and local levels.					
8-1(3)	Direct penalty monies from solid waste enforcement actions to municipal and regional recycling and other diversion programs.					
8-1(4)	Increase the Solid Waste Assessment beyond the present \$1.50 per ton.					
8-1(5)	Use state bond funds for needed infrastructure projects such as publicly controlled composting facilities and recycling facilities.					
8-2	CT DEP will initiate discussion with the Connecticut General Assembly regarding options for funding, including directing a significant portion of any new funds to municipal and regional programs.	Legislative	High	Other = \$\$\$	Short term	DEP
8-3	CT DEP will work with the CT Department of Economic Development and Community Development to identify the types of economic assistance that are needed and could be provided to businesses, especially recycling, composting or other businesses that directly support the goals of the Plan.	Administrative	High	Staff = \$	Short term	DEP, State agency

(1) Costs estimates include start up and on-going implementation: \$ = ~ 1Fte or < \$100,000; \$\$ = 2-5 Ftes or \$100,000 to \$500,000; \$\$\$ = >5 ftes or > \$500,000

(2) Lead will be responsible for initiating action, Key Partners may be responsible for implementation

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