

MASIC
x
GC
1
.S65
no. 121

Going for the Goal

Long Island and the New York State
1997 Recycling Rate Mandate

Part V of an Assessment of Recycling on Long Island



Going for the Goal

Long Island and the New York State
1997 Recycling Rate Mandate

Part V of an Assessment of Recycling on Long Island

David J. Tonjes
R. Lawrence Swanson

Waste Reduction and Management Institute
Marine Sciences Research Center
The University at Stony Brook

May, 1997

Special Report # 121
Reference 97-02

Approved for Publication:



J.K. Cochran
Dean and Director

MASIC

x

GC

|

.S65

no. 121

6/8/95
BR

Table of Contents

Table of Contents	i
List of Tables	ii
Executive Summary	S-1
Introduction	1
1. Solid Waste Management Plans	11
2. 1997 Recycling and Waste Reduction Projections	23
3. 1997 Projections and the New York State Goal	29
Conclusions	35
Acknowledgements	39
References	41
Personal Communications	43

List of Tables

S-1. Calculated Recovery Rates for Long Island (1994 Data), Using Three Waste Stream Sizes	S-6
S-2. 1997 Projected Long Island Per Capita Waste Diversion Rates	S-8
S-3. Projected 1997 Waste Stream Recovery Rates for Long Island Municipalities	S-9
1. Calculated Recovery Rates for Long Island (1994 Data), Using Three Waste Stream Sizes	7
2. 1997 Projected Long Island Recycling, by Municipality	27
3. 1997 Projected Long Island Per Capita Recycling Rates	27
4. 1997 Projected Long Island Waste Diversion, by Municipality	28
5. 1997 Projected Long Island Per Capita Waste Diversion Rates	28
6. Projected 1997 Waste Management, by Municipality	32
7. Projected 1997 Waste Stream Recovery Rates for Long Island Municipalities	33

List of Figures

1. Long Island Municipalities	10
-------------------------------	----

Executive Summary

This is the fifth part of a six-part series on recycling on Long Island. This part, Going for the Goal, discusses the possibility of Long Island as a whole, and its constituent municipalities, meeting the New York State 1997 goal of 50% waste reduction and recycling. The goal was set in 1987 as part of the New York State Solid Waste Management Plan (SWMP). Because of its use as a regulatory tool by the State in reviewing local waste management planning, and as a permit condition in many projects, this goal can be considered to be a "mandate" -- something that has been required of those at whom it is aimed.

Long Island, as considered in this report, is comprised of Nassau and Suffolk Counties. It contains a population of approximately 2.6 million. It is primarily suburban in character (although it has some urban areas in western Nassau County, and the eastern portions of Suffolk County

contain agricultural and/or undeveloped land, and tourist resorts). Most of the suburbanization of Long Island occurred after World War II.

The first part of the series, Doing the Right Thing, discussed the growth and extent of municipal recycling programs. Long Island municipal recycling programs began in earnest after the Islip Garbage Barge in 1987. By 1994 (the last year completely discussed in the report), all 15 municipalities in Nassau and Suffolk Counties had mandatory source separation programs. Although each program is unique, all of the mandatory programs recycle newspaper, and glass, metal and plastic containers. All but one of the mandatory programs also target corrugated cardboard; all but one of the municipalities also recycle yard wastes. All of the municipalities target additional materials, as well, although the particulars vary. Differences in the means of amassing recyclables, processing them, and the participants of the recyclables programs also distinguish each municipality.

These programs represent tremendous growth over the preceding ten years. Only one mandatory and several voluntary programs existed in 1986. The second volume, Comparing Apples and Oranges, discussed municipal recycling quantitatively, and found, naturally, that the amount of wastes managed through recycling programs increased tremendously with the qualitative changes in general waste management strategies.

Comparing Apples and Oranges was divided into two parts. Part A was essentially a compilation of waste management statistics from the 15 municipal programs with a focus on

recycling statistics. Part B was an analysis of the data presented in Part A. The primary conclusion of Volume II was that the Long Island-wide recycling rate for 1994 was 31% (based on municipally determined recycling of over 800,000 tons, and waste flows accounted for by the municipalities). The recycling tonnages claimed by the municipalities actually account for 25% of the total Long Island waste stream.

Additional analysis found that, on a per capita basis, in 1994 Long Islanders recycled an average of 625 pounds (nearly 2 pounds person⁻¹ day⁻¹). Different municipalities could be cited as the "best" recyclers in 1994: the Town of Shelter Island had the best recycling rate, at 45% of its claimed waste stream; the Town of Hempstead recycled the most per capita at 955 pounds person⁻¹ year⁻¹; the Town of East Hampton separated the most "household recyclables" (the paper and containers collected at curbside or separated at drop-off centers) at 365 pounds person⁻¹ year⁻¹; and the Town of Huntington had the best curbside collection program, collecting 241 pounds person⁻¹ year⁻¹.

However, all municipalities had clearly increased the amount of wastes recycled over time. Many Long Island recycling programs appear to have become "mature" by 1994, with slowed or little increases in recycling tonnages except by adding new materials or changing accounting procedures.

Additionally, there appears to be a disparity between public perception of recycling (the household recyclables) and what accounts for most of Long Island's recycling credits. Household

recyclables accounted for less than 30% of all recycling in 1994, yard waste accounted for nearly 40%, and "other materials" was the remaining third of the tonnages.

Part III, Plumbing the Unknown, attempted to document the private sector with the same breadth and detail as the municipal efforts. This was not possible, because waste management companies on Long Island tend to be small and privately-held (limiting public information), and because of the substantial organized crime role in the Long Island carting industry (which also reduces information availability because of illegal practices and intimidation). State and local government oversight was also deemed to be inadequate.

Nonetheless, model projections and estimations based on the limited data base found that 200,000 tons of commercially-generated solid wastes were recycled by carters and associated transfer stations outside of any recycling documented by the municipalities in 1994. Furthermore, at least 75,000 tons of paper were marketed directly by the waste generator to recycling middlemen, and 75,000 tons of yard wastes may have been composted in small sites by landscapers and nursery businesses. Therefore, it is possible to state that some 350,000 tons of materials were recovered outside of the municipalities' accounting in 1994. This additional tonnage represents 11% of the annual Long Island waste generation total.

Part IV of the series, Extending the Definition, discussed waste reduction as a waste management concept. Using an estimation procedure for "Don't Bag It" programs for yard wastes, estimated tonnages that might have been diverted in 1994 from the waste stream were

assigned to the appropriate municipalities. The work already accomplished in Part II (B) and Part III was combined with an estimation of recycling credits from the State nickel deposit program. This appeared to create a maximal recycling total for Long Island. This recycling total was combined with the estimate of waste reduction to quantify, in a conservative fashion, the maximum waste diversion that occurred on Long Island in 1994.

The sum of municipally-accounted for and private sector recycling on Long Island was found to be approximately 1.175×10^6 tons in 1994. This totaled to some 900 pounds person⁻¹ in 1994, and accounted for approximately 35% of the waste stream. The Town of Shelter Island appeared to recycle the greatest amount per person, at 1000 pounds person⁻¹ year⁻¹; this rate almost indistinguishable from the rates of Hempstead and Southold. Nickel deposit recycling was estimated at nearly 2% of the waste stream (approximately 75,000 tons in 1994). This raised the estimates of total recycling to 36% - 38%, and the Long Island-wide per capita recycling rate was approximately 950 pounds person⁻¹ year⁻¹. Because of too many uncertainties in municipal waste stream sizes, we declined to estimate the individual municipality's percentage recycling rates.

Waste reduction was estimated to also account for 2% of the total Long Island waste stream. This made overall waste diversion, Long Island-wide, between 37% and 40% of the total waste stream. The tonnage so managed in 1994 appears to have been approximately 1.3×10^6 , and the Long Island per capita rate was approximately 1000 pounds person⁻¹ year⁻¹. Islip appeared to divert the most wastes on a per capita basis, at 1125 pounds person⁻¹ year⁻¹.

It was possible to construct, therefore, a range of recovery rates for Long Island as a whole (and, indeed, similar ranges for the individual municipalities). The range of values is in keeping with a theme of this report: recycling rate calculations depend greatly on what is included in the calculations (and what is excluded).

Table S-1. Calculated Recovery Rates for Long Island (1994 Data), Using Three Waste Stream Sizes

Estimate Number	Estimate Basis	Percent (2.6 x 10 ⁶ tons)	Percent (3.25 x 10 ⁶ tons)	Percent (3.5 x 10 ⁶ tons)	Per Capita (lbs. person ⁻¹ year ⁻¹)
1	Curbside-Dropoff (Paper & Containers)	9%	7%	7%	175
2	All Municipally-reported	31%	25%	24%	625
3	(2) plus Unaccounted-for Commercial Sector		31%	30%	775
4	(3) plus "Other" -- OCC and Yard Wastes		36%	34%	900
5	(4) plus Bottle Bill Returns		38%	36%	950
6	(5) plus "Don't Bag It" Estimates		40%	37%	1000

The rates in Table S-1 provide support for assertions that Long Islanders recover wastes better than most other areas of the country. In fact, it is likely that no other region can claim per capita rates approaching the half-ton recoveries shown here, and few can document as well the calculated percentages. It is also true that few areas of the country produce waste as well as Long Island -- which is at least partially responsible for the impressive recovery data generated here.

This volume, Going for the Goal, begins by discussing the status of solid waste management plans (SWMPs) for the Long Island municipalities. In order to make an accurate projection of future Long Island recycling rates, plans for future activities must be clearly understood.

Although most Long Island municipalities (12 of 15) have submitted SWMPs to the State, and seven municipalities have had them accepted, a cursory review of these plans clearly shows that they have not been implemented as intended. There are various reasons for these failures. Nonetheless, it seems clear that few improvements in local recycling infrastructures have occurred since the data were collected for Doing the Right Thing, or will occur before the end of 1997.

Therefore, few changes need to be made to the data from 1994 that have been previously discussed. Some slight improvements in recycling rates can be forecast; solidification of several yard waste programs will provide additional recycling credits; and the spread of "Don't Bag It" programs should lead to improved waste reduction rates. The application of all of these leads to a forecast of slightly less than 40% recovery for Long Island at the end of 1997. Long Island as a whole does not appear to be likely to meet the State goal.

Does this mean that the individual municipalities on Long Island will not meet the goal? There are various ways of addressing this question. One would be to compare each municipality's recovery rate on a per capita basis to the mean rate necessary for Long Island to meet the State goal. If our lower estimate of waste generation is used (3.25×10^6 tons year⁻¹), then the Long

Island-wide per capita recovery goal is approximately 1250 pounds person⁻¹ year⁻¹. If our higher estimate (3.5 x 10⁶ tons year⁻¹) is used, the Long Island-wide per capita recovery goal is nearly 1350 pounds person⁻¹ year⁻¹. Based on our waste recovery projections from 1994 data, only East Hampton would meet either goal; on the other hand, Hempstead, Huntington, Islip, Shelter Island, and Southampton appear to have achieved 90% of the lower per capita waste recovery rate, if the upper bounds of the data are used. Suffolk County, as a whole, also appears to have nearly achieved 90% of the State goal (based on the data upper bound for per capita computations, see Table S-2).

Table S-2. 1997 Projected Long Island Per Capita Waste Diversion Rates (in pounds person⁻¹ year⁻¹)

	Waste Diversion Rate	Degree of Rounding
Nassau County	1000	50
Glen Cove	450	50
Hempstead	1100	50
Long Beach	400	25
North Hempstead	625	25
Oyster Bay	675	25
Suffolk County	1100	100
Babylon	700	25
Brookhaven	925	25
East Hampton	1400	200
Huntington	1100	100
Islip	1100	25
Riverhead	900	100
Shelter Island	1100	100
Smithtown	900	50
Southampton	1100	50
Southold	1000	100
Long Island Total	1000	100

There are other means of addressing the State goal. The most straightforward is on a percent basis. We have been loathe to create such percent recovery rates for the municipalities as we have expanded the amount of recycling credits beyond municipal claims, due to concerns about waste stream sizing. It is possible to create percentage recovery rates by using disposal tonnages for each municipality (or estimates, where the exact tonnages were not available) from the last available year, along with the recovery tonnages we have generated. In that case, Islip, Shelter Island and Southampton are forecast to exceed the 50% goal. In addition, Brookhaven and Hempstead will be close to meeting the goal (recovery rates greater than 45%, but less than 50%) (see Table S-3).

Table S-3. Projected 1997 Waste Stream Recovery Rates for Long Island Municipalities

Nassau County	37%
Glen Cove	23%
Hempstead	46%
Long Beach	21%
North Hempstead	28%
Oyster Bay	36%
Suffolk County	40%
Babylon	26%
Brookhaven	49%
East Hampton	43%
Huntington	41%
Islip	52%
Riverhead	40%
Shelter Island	54%
Smithtown	36%
Southampton	61%
Southold	39%
Long Island Total	39%

It must be clear that such measures are, in most of the cases demonstrated here, artificial. There is an inherent contradiction in accountings that find the whole does not achieve a certain level, whereas as many of its constituents do. If coming close to a goal is counted as meeting a goal (and achieving 90% of the goal is arbitrarily accepted as "coming close"), and the methodologies discussed above are combined, seven of the 15 Long Island municipalities meet the State recycling goal. These seven account for nearly two-thirds (65%) of Long Island's population.

This exercise clearly shows that many Long Island municipalities may be able to demonstrate compliance with the State mandate, and in fact most of Long Islanders could claim to live where the mandate is (almost) met. Yet Long Island as a whole will not meet the mandate. In actual tonnages recovered, our forecast is that less than 40% of all Long Island wastes will be recovered. This "contradiction" reinforces the refrain we have sounded from the first volume of this report: recycling rates and tonnages depend on what is counted, and what is not, and there is no consistent interpretation of these categories.

The data also displays the undeniable fact that Long Island recovery rates have improved tremendously from the minimal rates of a decade ago. The improvement is almost enough to make credible claims that Long Island and its municipalities have achieved the State waste reduction and recycling goal -- but not quite.

Introduction

The Waste Reduction and Management Institute (WRMI) was established in 1985 by the New York State Legislature (as the Waste Management Institute). The mission of WRMI is to reduce the impact of waste generation on society through a program of research, assessment, education, and policy analysis. Locally, there is a need to compile accurate and credible information about Long Island's solid waste stream and infrastructure. This need was initially addressed by the publication of Where Does It All Go? in 1992 (Tonjes and Swanson).

Solid waste management on Long Island has evolved considerably since the data were collected for that report. This project began as an update to Where Does It All Go? In the course of data collection and analysis, it became obvious that certain aspects of Long Island's solid waste structure were deserving of study in and of themselves. The focus of the proposed report became recycling and its associated processes. As our assessment grew, it was suggested

to us that the report had grown to unwieldy size, and would be of little utility if issued as a single document. We therefore have attempted to break the initial report into manageable pieces.

This paper, Going for the Goal, is the fifth of a series of six related reports. All six of the reports discuss some aspect of recycling in Nassau and Suffolk Counties. Each report is intended to stand alone; however, the reader interested in all aspects of the recycling process on Long Island would reap the most benefit by reading the reports in order.

Going for the Goal, discusses the possibility of Long Island as a whole, and its constituent municipalities, meeting the New York State 1997 goal of 50% waste reduction and recycling. The goal was set in 1987 as part of the New York State Solid Waste Management Plan (SWMP). Because of its use as a regulatory tool by the State in reviewing local waste management planning, and as a permit condition in many projects, this goal can be considered to be a "mandate" -- something that has been required of those at whom it is aimed.

Doing the Right Thing (Tonjes and Swanson, 1996a), the first report in the series, was a report on the growth and evolution of Long Island's municipal recycling programs. It was a qualitative, descriptive account, examining the differences and similarities among the Long Island municipalities' approaches to recycling. It naturally concentrated on recycling activities accomplished by the municipalities themselves.

Comparing Apples and Oranges: Part A: The Data Report (Tonjes and Swanson, 1996b)

followed the format of Doing the Right Thing. Each municipality was given a separate section, and details of changes in recycling tonnages (in total, and by material) and percentages were presented, as available. We believe the detail of Part A is necessary to support the levels of analysis that we presented in its companion volume, Part B; we also recognize that interest in these details may be restricted to a very select audience.

Comparing Apples and Oranges: Part B: The Data Analysis (Tonjes and Swanson, 1996c)

used the information from Part A to reach several conclusions regarding municipal recycling efforts. The overall conclusion is that recycling has become an important waste management tool on Long Island, and has grown significantly since 1986 (when recycling could fairly be described as a waste management novelty). Quantitatively, based on data supplied by the municipalities, the Long Island-wide recycling rate for 1994 was 31%. By factoring in the entire Long Island waste stream, this rate was better considered to be 25%. On a per capita basis, in 1994 Long Islanders recycled an average of 625 pounds (nearly 2 pounds person⁻¹ day⁻¹).

These rates and percentages varied widely for different municipalities. For 1994, based on claimed tonnages and rates (or our estimations of those rates, where data were not made available), the Town of Shelter Island appeared to have had the best recycling rate (45% of its claimed waste stream). In terms of per capita tonnages claimed, the Town of Hempstead could be considered to have recycled the most (955 pounds person⁻¹ year⁻¹). If "household recyclables" (the paper and containers collected at curbside or separated at drop-off centers) only are

considered, then the Town of East Hampton separated the most (365 pounds person⁻¹ year⁻¹). Huntington could be considered to have had the best curbside collection program, collecting 241 pounds person⁻¹ year⁻¹. All municipalities had clearly increased the amount of wastes recycled over time. Many Long Island recycling programs appear to have become "mature" by 1994, however, with slowed or little increases in recycling tonnages from year to year except by adding new materials or changing accounting procedures.

According to municipal statistics, household recyclables accounted for less than 30% of all recycling in 1994. Yard waste accounted for nearly 40% of the claimed tonnages, and "other materials" (predominantly private sector recycling and post-collection recyclables separation) was another third of the tonnages. Of the household recyclables, paper accounted for well over two-thirds of the tonnages, and newspaper alone was more than half of the materials collected.

There appears to be a disparity between public perception of recycling (the household recyclables) and what accounts for most of Long Island's recycling credits.

The third volume, Plumbing the Unknown (Tonjes and Swanson, 1996d) attempted to address private sector recycling practices not accounted for in the municipal compilations. This was not completely possible, because waste management companies on Long Island tend to be small and privately-held (limiting public information), and because of the substantial organized crime role in the Long Island carting industry (which also reduces information availability because

of illegal practices and intimidation). State and local government oversight was also deemed to be inadequate.

Nonetheless, model projections and estimations based on limited data base found that 200,000 tons of commercially-generated solid wastes were recycled by carters and associated transfer stations outside of any recycling documented by the municipalities in 1994. Furthermore, at least 75,000 tons of paper were marketed directly by the waste generator to recycling middlemen, and 75,000 tons of yard wastes may have been composted in small sites by landscapers and nursery businesses. Therefore, it appears likely that some 350,000 tons of materials were recovered outside of the municipalities' accounting in 1994. This additional tonnage represents 11% of the annual Long Island total waste generation.

The fourth volume, Extending the Definition (Tonjes and Swanson, 1997), began by discussing waste reduction as a waste management concept. Difficulties in enumerating waste reduction efforts were explored. An estimation procedure for the waste reduction effort most easily implemented by local municipalities, the "Don't Bag It" programs for yard wastes was created, and estimated tonnages that might have been therefore diverted in 1994 were assigned to the appropriate municipalities.

The work already accomplished in Part II (B) and Part III was combined with an estimation of recycling credits from the State nickel deposit program. This appeared to create a maximal recycling total for Long Island. This recycling total was combined with the estimate of

waste reduction to quantify, in a conservative fashion, the maximum waste diversion that occurred on Long Island in 1994.

The sum of municipally-accounted for and private sector recycling on Long Island was found to be approximately 1.175×10^6 tons in 1994. This totaled to some 900 pounds person⁻¹ in 1994, and accounted for approximately 35% of the waste stream. The Town of Shelter Island appeared to recycle the greatest amount per person, at 1000 pounds person⁻¹ year⁻¹ (albeit that Town's per capita rates are affected by not including seasonal population fluctuations); however, data uncertainties due to rounding make this rate almost indistinguishable from the rates of Hempstead (at 955 pounds person⁻¹ year⁻¹) and Southold (at 925 pounds person⁻¹ year⁻¹). The Town of Hempstead would receive credit for recycling the greatest tonnages of any of the municipalities in this accounting. Nickel deposit recycling was estimated at nearly 2% of the waste stream (approximately 75,000 tons in 1994). This raised the estimates of total recycling to 36% - 38%. Although the relative recycling rates of the municipalities did not change, the following Towns all appeared to recycle more than 900 pounds person⁻¹ year⁻¹: Hempstead and North Hempstead in Nassau County; and East Hampton, Huntington, Islip, Shelter Island and Southold in Suffolk County. The Long Island-wide recycling rate was approximately 950 pounds person⁻¹ year⁻¹. Because of too many uncertainties in municipal waste stream sizes, we declined to estimate the individual municipality's percentage recycling rates.

Waste reduction was estimated to also account for 2% of the total Long Island waste stream. This made overall waste diversion, Long Island-wide, between 37% and 40% of the total

waste stream. The tonnage managed in 1994 appears to have been approximately 1.3×10^6 . Islip appeared to divert the most wastes on a per capita basis, at 1125 pounds person⁻¹ year⁻¹. The uncertainties associated with rounding errors make it seem that the rates for Shelter Island (1100 pounds person⁻¹ year⁻¹) and Southold (1050 pounds person⁻¹ year⁻¹) were approximately the same as Islip's. Hempstead (1027 pounds person⁻¹ year⁻¹) and Huntington (1000 pounds person⁻¹ year⁻¹) also appeared to divert wastes at rates equal to or greater than the Long Island per capita rate for 1994 (approximately 1000 pounds person⁻¹ year⁻¹), and East Hampton and North Hempstead were within error estimates of the Island-wide rate (the Long Island-wide rate was greater than the weighted mean of the municipalities because of some unallocated credits).

For 1994, therefore, it was possible to construct a range of recovery rates for Long Island as a whole. These rates varied, depending upon the size of the total waste stream considered, and in terms of the materials recovered from the waste stream.

Table 1. Calculated Recovery Rates for Long Island (1994 Data), Using Three Waste Stream Sizes

Estimate Number	Estimate Basis	Percent (2.6 x 10 ⁶ tons)	Percent (3.25 x 10 ⁶ tons)	Percent (3.5 x 10 ⁶ tons)	Per Capita (lbs. person ⁻¹ year ⁻¹)
1	Curbside-Dropoff (Paper & Containers)	9%	7%	7%	175
2	All Municipally-reported	31%	25%	24%	625
3	(2) plus Unaccounted-for Commercial Sector		31%	30%	775
4	(3) plus "Other" -- OCC and Yard Wastes		36%	34%	900
5	(4) plus Bottle Bill Returns		38%	36%	950
6	(5) plus "Don't Bag It" Estimates		40%	37%	1000

(Sources: (1) & (2): Tonjes and Swanson, 1996c; (3): Tonjes and Swanson, 1996d; (4), (5), & (6): Tonjes and Swanson, 1997).

The rates in Table 1 provide support for assertions that Long Islanders recover wastes better than most other areas of the country. In fact, it is likely that no other region can claim per capita rates approaching the half-ton recoveries shown here, and few can document the calculated percentages as well as they have been here. It is also true that few areas of the country produce waste as well as Long Island -- which is at least partially responsible for the impressive recovery data generated here.

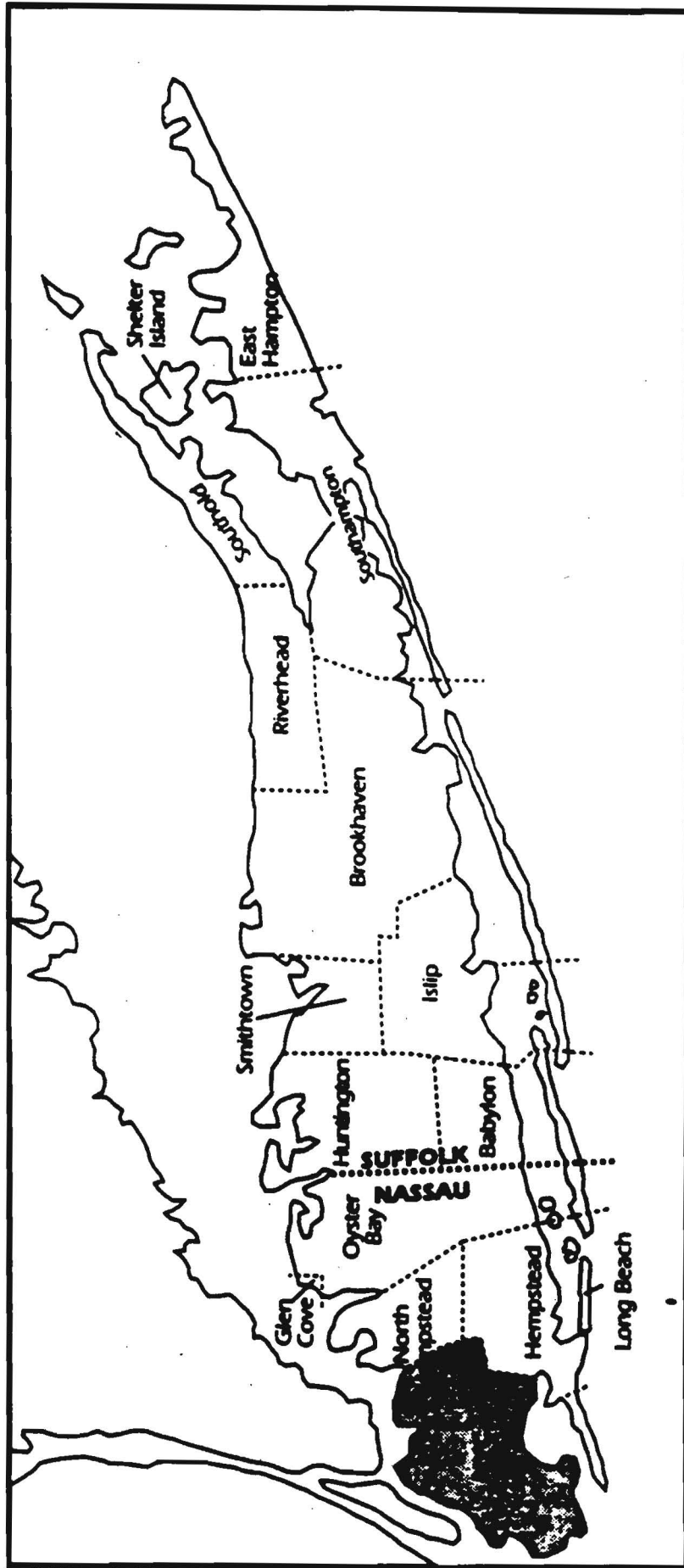
This volume, Going for the Goal, will begin by discussing solid waste management plans (SWMPs). This is done, as it is difficult to accurately estimate the amount of waste diversion from 1994 data without understanding what changes are projected to have occurred by the end of 1997. The validity of the SWMPs will be evaluated in light of what has actually occurred in the various municipalities. Based on this, estimates will be made of the recycling and waste reduction rates for 1997. These will be compared to several measures of the State goal of 50% waste diversion, both for Long Island as a whole, and for particular municipalities. Based on this work, the likelihood of Long Island and the municipalities meeting the State goal will be discussed.

Long Island, as considered in this report, is comprised of Nassau and Suffolk Counties. It contains a population of approximately 2.6 million. It is primarily suburban in character; most of the suburbanization occurred after World War II. Some portions of western Nassau County are considered urbanized. The eastern portions of Suffolk County contain agricultural and/or undeveloped land, and tourist resorts. Suffolk County still generates more income from agriculture than any other county in New York (Tonjes and Swanson, 1996a).

Long Island contains 15 municipal solid waste management planning units -- ten Towns in Suffolk County (Babylon, Brookhaven, East Hampton, Huntington, Islip, Riverhead, Shelter Island, Smithtown, Southampton and Southold), and the three Towns (Hempstead, North Hempstead, and Oyster Bay) and two cities (Glen Cove and Long Beach) in Nassau County (Figure 1). Although Brooklyn (Kings County) and Queens County are geographically part of Long Island, history, political divisions, and common usage exclude them from public policy discussions of Long Island issues. They are not discussed in this report (Tonjes and Swanson, 1996a).

Long Island's municipal waste management infrastructure is organized differently from other areas of New York State. Elsewhere, waste management is the function of county government, or, in some instances, organizations comprised of groups of counties. On Long Island, the responsibility is assumed by Town or City government (the next lower level of government), and, even, in some aspects, by Village government. This has led to a multiplicity of approaches in a relatively restricted geographical space. In addition, changes in waste management control and policies have resulted in most municipalities managing only portions of their total waste streams; the remainder are managed by private industry, most often with little governmental oversight (Tonjes and Swanson, 1996a; Tonjes and Swanson, 1996d).

Figure 1. Long Island Municipalities



1. Solid Waste Management Plans

Solid Waste Management Plans (SWMPs) are the regulatory tools used by New York State to try to ensure that the State reaches its self-imposed recycling goal. These plans are required of any "planning unit" in order to receive a major solid waste facility (landfills, MRFs, incinerators) permit (New York State Department of Environmental Conservation, 1993). The goal was set at 50% of the waste stream. Some 8 - 10% of the waste stream was to be "waste reduced," and the remainder (40 - 42%) was to be recycled (New York State Department of Environmental Conservation, 1987). Difficulties in quantifying waste reduction has meant that the goal is considered to have been met by the State if waste disposal has been reduced by 50% from the reference year (1988) (New York State Department of Environmental Conservation, 1995).

State-wide planning units are most often counties or groups of counties. On Long Island, because historically each municipality managed its own solid waste, the planning units are the municipalities.

Different municipalities have had different experiences with the planning process. The Town of Brookhaven, for example, went through three different versions of its proposed SWMP over a six-year period. The total cost to the Town for engineering and legal assistance could well have exceeded \$1 million (Heil, 1994). The document, along with its revised Comprehensive Recycling Analysis (CRA), is composed of three thick volumes, and is difficult to read. The Town of North Hempstead, on the other hand, quickly developed its SWMP in-house, as an adjunct to the Town of Babylon SWMP. The time invested in the project was under six months (Miner, 1994), and the cost certainly did not exceed \$100,000.

The SWMPs are constructed for long-term planning purposes; thus, in one sense they are broad planning documents. The route often used to approach the SWMP process is the "Generic Environmental Impact Statement" for a municipal waste management system. This is, conceptually, a discussion of the environmental impacts of various solid waste choices, without, necessarily, site-specific issues being raised (Dvirka and Bartilucci, 1993; Tonjes, 1993; Town of North Hempstead, 1993). However, State implementation of the regulations has also made the plans extremely specific. Part of the process is a waste stream composition analysis, and projections of the future recovery rates of each material in the waste stream composition (New York State Department of Environmental Conservation, 1993). The waste stream composition

analyses, no matter how carefully conducted, have large elements of uncertainty (projections of the amounts of newspaper in a municipality's waste stream 10 or 15 years in the future are necessarily guesswork). Specific recovery rate projections are required for each material. From these rates, recovery tonnage projections are developed. These recovery tonnage projections are also necessarily guesswork (if the amount of newspaper is uncertain, and the recovery rate is uncertain, then the recovery tonnage based on a rate applied to the amount of material presumed to be in the waste stream will also be uncertain). To obtain State acceptance of a SWMP, the rates in these tables of projections should be ever-increasing until some optimal rate is reached (Vitale, 1993).

As another precondition for State acceptance, the plans are required to show that the municipality will exceed the 1997 50% recovery goal (Vitale, 1993). This is a fine concept for planning purposes, as it encourages continual striving; however, in 1995 the State began a SWMP compliance program. At this time, the program is strictly a reporting requirement (Tonjes, 1995; Town of Babylon, 1995; Town of Oyster Bay, 1995); however, it is not clear whether the State will adopt any enforcement provisions in the future. Most SWMPs have attempted to preclude such attempts by inserting language denying the validity of the projections for regulatory purposes (Dvirka and Bartilucci, 1993; Tonjes, 1993; Town of North Hempstead, 1993).

The SWMP program intended that each municipality plan for all elements of municipal solid waste (MSW) generated within the planning unit (New York State Department of Environmental Conservation, 1987; New York State Department of Environmental Conservation,

1993). This concept was challenged by the Town of Brookhaven (Tonjes, 1993) and New York City (Thomas, 1994), which did not wish to take responsibility for all aspects of commercial waste generation within their borders. The New York State Department of Environmental Conservation (NYSDEC) acquiesced to these wishes in those particular cases. The demise of flow control in the Carbone decision (1994) makes comprehensive planning a difficult proposition for other planning units, as apparently only contracted-for wastes can be controlled -- that is, directed to particular facilities or treatments (A.A. & M. Carting Service et al. vs. Town of Babylon, NY, et al., and USA Recycling, Inc., et al. vs. Town of Babylon, NY, et al. [consolidated cases], 1995; New York State Department of Environmental Conservation, 1995; SSC Corp. vs Town of Smithtown et al., 1995; Tonjes and Swanson, 1996d). Presumably, local recycling laws could indirectly support many of the intents of local SWMPs, but these laws must be carefully drawn so as to not transgress the limits imposed in Carbone. Some pending legislation in Congress may allow for some limited flow control, however (apparently limited to existing pre-Carbone flow control authorizations¹) (New York State Department of Environmental Conservation, 1995). Therefore, future SWMPs may be somewhat limited in scope.

¹ Technically, local flow control laws had to be authorized by the respective State legislature; one of the hopes of flow control advocates in the Carbone case had been for a "limited" Court ruling, as the Clarkstown law had not been authorized by the New York State legislature (Cogen, 1994; Swenson, 1994b). Municipalities with flow control authorization on Long Island (from the New York State legislature) are Glen Cove, Hempstead, Long Beach, North Hempstead, Babylon, Brookhaven, Huntington, Islip, and Smithtown. Enactment of local flow control laws was the usual first step for municipalities contemplating construction of a WTE incinerator (because of financing requirements). Only Brookhaven (of the Long Island municipalities listed above) never actually wrote a local flow control law (Tonjes and Swanson, 1992; Tonjes, 1993; New York Department of Environmental Conservation, 1995).

As mentioned above, SWMPs are necessary for current NYSDEC approval of any municipal major facility permits. It is not surprising that those municipalities with SWMPs on Long Island are those that needed permits after 1988.

A totally private facility (privately owned, financed, and operated) is only required to be in accord with its planning unit's SWMP (New York State Department of Environmental Conservation, 1993), and cannot, as a practical matter, be expected to have its own SWMP (on the principle that private firms should not be responsible for public planning). The issue of private facility permits and accord with local SWMPs is somewhat controversial. The NYSDEC apparently has never denied a permit to a private company on the basis of a lack of accord with an existing SWMP (Heil, 1994). The regulations clearly state that any facility to be permitted must be in accord with SWMPs for where the facility's wastes are generated (New York Department of Environmental Conservation, 1993). Enforcement of this rule is probably inhibited by fear of litigation for restraint of trade.

In general, the NYSDEC is loathe to deny permits for any reason other than technical failure of regulatory engineering standards. Although the regulations require, for example, that facilities must comply with all local zoning regulations, Long Island waste managers have found that the NYSDEC will issue permits to facilities without zoning approval (for example, the Long Island Composting and Hubbard Power and Light facilities, in Brookhaven and Islip, respectively). The State's reason has been that zoning enforcement is a local, not State, question. The private facilities often can use the existence of a State permit to fight local zoning

enforcement attempts (Cowen, 1993; Heil, 1994; Scully, 1994; Heil, 1995b; Moore, 1995; Romaine, 1995). This issue is one which has not yet been resolved.

The status of each Long Island SWMP is as follows:

Glen Cove: Glen Cove and Long Beach did not meet the NYSDEC's definition as a planning unit, and so were ineligible to file SWMPs prior to 1996. In 1996, a law was passed allowing them to become planning units (Slackman, 1996). Glen Cove, in fact, because of the permit system, needed a SWMP for its incinerator to re-open. The City administration elected in 1993 (and re-elected in 1995) opposed this action. The City's contract with Island Recycling called for Island Recycling to write the SWMP as part of the permitting process for the incinerator (Ain, 1995). The City's arrangement with Universal Recycling, where Universal will manage the City's waste stream using the incinerator site as a transfer station, since no major facility permits are required, may mean that the City will not have to file a SWMP (Tonjes and Swanson, 1996a). Additionally, the permitting process for the transfer station for Universal Recycling, since it will be a private facility, does not require a City SWMP (see above).

Hempstead: the Town has an approved SWMP (1993), written to allow operation of its incinerator. The SWMP calls for a 52% recycling rate by 1997; this rate, which is greater than achieved in 1992 by the Town, will be reached through the addition of new materials to the recycling list (corrugated cardboard, primarily) and steady increases in recovery

rates for all other materials. The SWMP does not foresee any new facility construction (CSI Resource Systems, Inc., 1993).

Long Beach: the City's major waste management facility, its incinerator, was privately owned and operated. The City could not write a SWMP prior to 1996; had not needed to write a SWMP; and, as it had not expected to build any solid waste facilities, did not plan to prepare a SWMP in the future. The closure of the incinerator by the NYSDEC in 1996 (to be implemented in 1997) may have complicated this situation somewhat (Cassese, 1996).

North Hempstead: North Hempstead has an approved SWMP (1993). The SWMP was written to gain permit approval for the facilities necessary to carry out its Inter-municipal Agreement with the Town of Babylon. The use of post-collection recovery of materials at Star Recycling and the Babylon Commercial and Residential Recycling Facility (CRRF) are the heart of the SWMP (Town of North Hempstead, 1993). With the demise of the IMA and the associated contracts, the North Hempstead SWMP is no longer applicable to the Town's situation (Tonjes and Swanson, 1996a). The Town's long-term contract with Chambers appears to negate any need for future Town facility construction (Heil, 1995; Tonjes and Swanson, 1996a); it may be interesting to see how the compliance program is applied in this situation (and others where SWMP-centerpiece facilities either no longer exist, are used, or were not built, such as Babylon and Brookhaven).

Oyster Bay: the Town does not have a SWMP. It is a long-expressed desire of the Town to do long-term solid waste planning; since its landfills and incinerators were closed in 1984, however, the Town has made do with short-term solutions (Swenson, 1994a).

Babylon: the Town has an accepted SWMP (1991; amended and re-approved in 1993 to reflect the Town's agreement with North Hempstead), but one which is based on the operation of the Commercial and Residential Recycling Facility (CRRF) as a post-collection recovery facility (Town of North Hempstead, 1993). The Town has an incinerator which will need a permit renewal, and it has generally expressed the desire to continue ashfilling (Kluesener, 1994). The Town may therefore be required to amend its SWMP to accord with the demise of the CRRF (Tonjes and Swanson, 1996a), in the future.

Brookhaven: the Town has an accepted SWMP (1994), which was written largely to facilitate its IMA with Hempstead, the construction of its MRF, and, later, to receive its permit for its landfill expansion. The SWMP calls for construction of a transfer station/post-collection recyclables recovery and compost feedstock production facility (Tonjes, 1993); the Town Board never accepted the proposal of the preferred bidder for this facility (as of the end of 1996), and it is unclear if it ever will (the issues include put-or-pay requirements in a post-flow control environment, and the capital costs) (Heil, 1995a). This makes many of the recovery projections in the SWMP speculative. The

Town will require permits for further phases of its landfill expansion project (Groben, 1995), and may face difficulties over its SWMP in those proceedings.

East Hampton: the Town has an accepted SWMP (1992), which was written to receive a permit for its composting/recycling facility (Bullock, 1992). The baseline year's data used in the SWMP (Tonjes and Swanson, 1992) now appear to be anomalous, and the projections based on this unusual data set and optimistic forecasts of performance of the composting facility appear to be out of line with actual recovery rates (Bullock, 1994; Garnham, 1996). It is not clear what the status of the East Hampton SWMP would be in a strict review. The facilities and measures called for in the SWMP are built, passed and adhered to, but because of flawed waste stream data, the achievements called for in the SWMP are not being met (wood waste recoveries were based on generation rates from a hurricane damage year [Tonjes and Swanson, 1996b]).

Huntington: Huntington has an approved SWMP (1994), written to permit its incinerator. The Town does not project a need for any new facilities. The SWMP calls for a recovery rate of "greater than 50%" in 1997, to be achieved by incremental improvements in its existing program (Dvirka and Bartilucci, 1993). The increases do not appear to be likely to be achieved.

Islip: Islip is in the process of responding to comments on its SWMP submission, which is needed because of the permits required for the Town's MRF, incinerator, and landfill. The

Town does have an approved Comprehensive Recycling Analysis, which is usually a stepping-stone to SWMP approval (New York State Department of Environmental Conservation, 1995; Scully, 1996).

Riverhead: Riverhead submitted a SWMP in 1990, which was not accepted by NYSDEC (Gablanz, 1991). The Town's arrangement with East End Recycling, where East End will operate the Town's transfer station, and own all other necessary facilities (Tonjes and Swanson, 1996a), appears to place Riverhead in an analogous situation with Long Beach. This is where the private operator of the facilities used by the Town will not be required to file a public planning document. However, inquiries received by the WRMI in 1997 indicate that the Town may in fact be (re-)writing its SWMP.

Smithtown: Smithtown's SWMP is in submission to the NYSDEC (December 1995). The Town received extensive comments on its original submission, and is in the process of resolving any conflicts between its plans and the State's desires for the Town. The SWMP will of necessity call for a greater than 50% recycling rate for 1997 -- "although it depends on what [the Town] count[s]" (Trent, 1995). No additional facilities appear to be called for.

Shelter Island: Huson Sherman, the supervisor of the Town, is writing the Town's SWMP "in my spare time" (Sherman, 1994); NYSDEC lists the Town's plan as "under review" (New York State Department of Environmental Conservation, 1995). Another

complication is that Shelter Island, as with Southold, would prefer to make plans that include at least one of its (larger) neighboring municipalities (Sherman, 1994).

Southampton: the Town has an approved SWMP (1993). The SWMP called for the construction of a MRF/MSW composting facility, with continued use of the Town's landfill (Malcolm Pirnie, 1993). However, the Town has rejected those plans, has now shut its landfill, and only manages drop-off MSW and recyclables (which it will manage without constructing additional major facilities, by shipping to other existing facilities) (Baker, 1996). The projections in the current SWMP are therefore no longer applicable.

Southold: the Town is currently managing its MSW and recyclables on a short-term basis, by shipping the materials out of Town from its transfer station. Its SWMP is under submission at this time. Apparently, a sticking point between State reviewers and the Town is that the Town has not developed a long-term waste management program in the SWMP. The SWMP calls for the Town to ship disposable MSW out-of-state while it seeks a long-term arrangement with another Long Island municipality (Bunchuck, 1994; New York State Department of Environmental Conservation, 1995). Thus, the Town's proposed SWMP appears to violate the State precept that SWMPs should be for long-range planning. Southold reportedly also would prefer to combine its solid waste future with at least one other of the East End municipalities (Sherman, 1994).

Of the fifteen Long Island municipalities, seven have received approved SWMPs. However, it might be construed that only three municipalities have SWMPs that might maintain validity under any kind of review (Hempstead, East Hampton, and Huntington) -- although the completion of Islip's and Smithtown's SWMPs would change that count substantially. The NYSDEC would prefer to describe the situation as seven approvals, and five plans "under review," out of 13 eligible municipalities (as of the end of 1994). Oyster Bay would be the sole identified SWMP holdout (New York State Department of Environmental Conservation, 1995).

Review of the SWMPs with an eye toward what has actually occurred on Long Island shows they are not reliable determinants of future recycling and waste management plans. They are useful in predicting facility construction, however. Given the lack of planned construction, it does not seem likely that any new facilities will be brought on line by the end of 1997 (assuming that the CRRF in Babylon remains essentially mothballed). Therefore, it is unlikely that any new recycling infrastructure will be added to the lineup described for 1994 in Doing the Right Thing (Tonjes and Swanson, 1996a).

2. 1997 Recycling and Waste Reduction Projections

Despite the lack of usable waste management plans for most Long Island municipalities, it is possible to take the 1994 data that are available, and make some projections for 1997 recovery rates on Long Island. In doing so, we will use the following guidelines:

- 1) unless new materials have been explicitly identified for inclusion in a recycling program, curbside recycling tonnages will not be increased or otherwise changed (beyond rounding up to whole numbers) from what was reported in Comparing Apples and Oranges: Part A (Tonjes and Swanson, 1996b). There is no evidence that participation rates in the programs necessarily increase over time, nor is rigid enforcement by the municipalities of existing laws likely.
- 2) commercial recycling tonnages may not increase from what was reported in Plumbing the Unknown (Tonjes and Swanson, 1996d); we do not have a means of approximating any proposed increase, nor any reason to project such a general trend;

3) Don't Bag It programs will be estimated as in Extending the Definition (Tonjes and Swanson, 1997). Although we will include additional tonnages for those municipalities that have adopted (or are expected to adopt) these programs, we will not decrease tonnages associated with composting programs;

4) the "general Long Island" recyclables (yard waste composting and corrugated cardboard/office paper recycling outside of municipal and private accountings) described in Plumbing the Unknown (Tonjes and Swanson, 1996d) will be continued, as will the credits associated with deposit container returns described in Extending the Definition (Tonjes and Swanson, 1997).

Specific elements in the projections include:

- 1) the addition of corrugated cardboard (and other recyclables) to the Hempstead, North Hempstead, Oyster Bay and Babylon programs will increase their curbside rates by 15% from 1994 rates;
- 2) the drop-off programs in the East End will increase their collection rates by 10%;
- 3) no "increase" from our calculated commercial recycling credit was granted to Babylon, despite the creation of its commercial waste management district. The district will provide recycling bins to each business, which may increase source separation rates. However, the Town will not be making any post-collection recyclables recovery efforts. It is far from clear that source separation efficiencies will be greater than the calculated post-collection rates. We did not include any changes in order to be conservative in these estimations.

4) the East Hampton composting facility will process 3000 pounds per day (500 tons per year) of MSW;

5) Smithtown and Southampton were assigned 5,000 ton composting credits. The estimate for Southampton is less than one-half of some earlier composting estimations. The Smithtown estimate is intentionally conservative, to reflect the conflicts between promoting Don't Bag It programs and composting efforts. These numbers may create a low bias for these Towns in comparison to other municipalities.

6) voluntary Don't Bag It programs will be in place in Oyster Bay, North Hempstead, Hempstead, and Babylon. However, we will give no additional recycling credits to Hempstead, due to the already large recycling credit received by the Town for its composting program (the underlying assumption is a Don't Bag It program would merely divert yard wastes from the composting program in Hempstead).

7) mandatory Don't Bag It programs will be in place in all other Suffolk County municipalities².

² One additional item should be noted. In preparing the earlier recycling estimates for Islip for 1994, a tonnage of 90,000 tons was created (24,000 tons of curbside recycling plus 23,000 tons of OCC from Waldbaums plus 30,000 tons of yard waste composting plus 7,000 tons of bulk metals recovery summing to 84,000 tons, and rounded up to 90,000). For this section, the similar estimate was not the same. It was only 85,000 tons, resulting from the sum of 24,000 tons curbside recycling and 60,000 "other municipally-accounted for recyclables." The latter was the rounded sum of 23,000 tons of OCC plus 30,000 tons composting plus 7,000 tons bulk metals, summing exactly to 60,000 tons -- and therefore not rounded. The difference is noticeable in some calculations.

The following total waste stream assumptions will be made:

- 1) all municipalities in Nassau will continue to manage the same sized waste streams as 1994;
- 2) Huntington, Shelter Island, Smithtown and Southold will continue to manage the same sized waste streams as in 1994;
- 3) to maximize incinerator usage, Babylon and Islip will dispose of 200,000 tons and 150,000 tons, respectively (which is approximately the same amount of wastes disposed in 1994);
- 4) Brookhaven will dispose of 200,000 tons of MSW to meet its IMA responsibilities with Hempstead;
- 5) based on partial year statistics, East Hampton and Riverhead will dispose of 14,500 tons and 15,000 tons, respectively (East Hampton's disposal total was decreased slightly to account for presumed greater amounts of MSW composting);
- 6) due to restrictions on facility use, the Southampton total waste stream will shrink to 30,000 tons.

Those factors were used to develop Tables 2 - 5. Table 2 is a projection of recycling tonnages for 1997, and Table 3 translates those tonnages into annual per capita rates (using 1994 year-round populations). Table 4 combines estimates for 1997 yard waste reduction tonnages with the Table 2 recycling tonnages to create 1997 "waste diversion" tonnages for the municipalities. Table 5 translates Table 4 as Table 3 translated Table 2. Rounding of these data creates considerable uncertainty.

Table 2. 1997 Projected Long Island Recycling, by Municipality (in tons)

	Curbside or Drop-off	Other Municipal Accounted	Modelled Private Sector	OCC and Compost Estimates	Bottle Returns	Projected Total 1997
Nassau County	125000	375000	20000	75000	40000	625000
Glen Cove	2500	1000	1500		600	5500
Hempstead	67000	300000			25000	400000
Long Beach	3500	300	2100		800	6500
North Hempstead	21000	22000	15500		5250	65000
Oyster Bay	30000	52000			7250	90000
Suffolk County	130000	170000	185000	75000	33000	600000
Babylon	15000	12500	29000		5000	60000
Brookhaven	37000	41000	59000		10250	145000
East Hampton	3300	6000	1000		400	11000
Huntington	23000	33000	28000		4750	90000
Islip	24000	60000	43000		7500	135000
Riverhead	2000	2000	3400		600	8000
Shelter Island	425	500	140		50	1100
Smithtown	13000	8000	16000		2750	40000
Southampton	9000	8000	2800		1100	21000
Southold	3300	3000	1200		500	8000
Long Island Total	250000	550000	200000	150000	75000	1225000
Estimated Percent of Total Waste Stream (3.5×10^6 tons year ⁻¹)	7%	16%	6%	4%	2%	35%

Table 3. 1997 Projected Long Island Per Capita Recycling Rates (pounds person⁻¹ year⁻¹)

	Recycling Rate	Degree of Rounding
Nassau County	1000	50
Glen Cove	450	50
Hempstead	1100	50
Long Beach	400	25
North Hempstead	625	25
Oyster Bay	625	25
Suffolk County	900	50
Babylon	600	25
Brookhaven	700	25
East Hampton	1400	200
Huntington	950	50
Islip	900	25
Riverhead	700	100
Shelter Island	1000	100
Smithtown	700	50
Southampton	900	50
Southold	800	100
Long Island Total	950	50

Table 4. 1997 Projected Long Island Waste Diversion, by Municipality (in tons)

	Recycling	Don't Bag It	Total
Nassau County	625000	10000	650000
Glen Cove	5500		5500
Hempstead	400000		400000
Long Beach	6500		6500
North Hempstead	65000		65000
Oyster Bay	90000	11000	100000
Suffolk County	600000	120000	700000
Babylon	60000	7500	70000
Brookhaven	145000	41000	190000
East Hampton	11000		11000
Huntington	90000	19000	105000
Islip	135000	30000	165000
Riverhead	8000	2300	10000
Shelter Island	1100	225	1300
Smithtown	40000	11000	50000
Southampton	21000	4500	25000
Southold	8000	2000	10000
Long Island Total	1225000	125000	1350000
Estimated Percent of the Total Waste Stream (3.5 x 10 ⁶ tons year ⁻¹)	35%	4%	39%

Table 5. 1997 Projected Long Island Per Capita Waste Diversion Rates (pounds person⁻¹ year⁻¹)

	Waste Diversion Rate	Degree of Rounding
Nassau County	1000	50
Glen Cove	450	50
Hempstead	1100	50
Long Beach	400	25
North Hempstead	625	25
Oyster Bay	675	25
Suffolk County	1100	100
Babylon	700	25
Brookhaven	925	25
East Hampton	1400	200
Huntington	1100	100
Islip	1100	25
Riverhead	900	100
Shelter Island	1100	100
Smithtown	900	50
Southampton	1100	50
Southold	1000	100
Long Island Total	1000	100

3. 1997 Projections and the New York State Goal

There can be varying interpretations of the projections displayed in Tables 2 - 5. On the one hand, these data show that tremendous accomplishments have been achieved in Long Island recycling and waste recovery. In 1986, the Long Island total recycling tonnage was considered to be less than 25,000 tons. A decade or so later, the projected total is expected to be a quarter of a million tons for curbside recycling alone, and nearly one and a quarter million tons for all forms of recycling. Adding in waste reduction should push the total to over the one and a quarter million ton level. Even by the most conservative waste stream estimation, that recovered tonnage represents almost 40% of the entire waste stream.

On the other hand, there is a mandate from New York State to recycle and waste reduce to a level so that only 50% of the waste stream is being disposed. The data as presented thus far are not especially amenable to interpretation in light of the mandate, at least for each municipality.

For Long Island as a whole, it seems clear that the nearly 40% recovery levels forecast do not meet the 50% State goal.

Long Island as a whole, however, does not have a governing body, and the two County governments are not responsible for waste management issues. The governments that will be judged by the State will be the municipalities.

The data we have presented in Tables 2 - 5 can be translated into "goal comparisons" by creating a per capita recovery goal. For Long Island as a whole, that would be a half of the waste generation rate per capita. That number depends on the tonnage chosen for the total waste stream. If 3.25×10^6 tons is the annual waste stream size, per capita waste generation is 2490 pounds person⁻¹ year⁻¹; if 3.5×10^6 tons is the annual waste stream size, per capita waste generation is 2680 pounds person⁻¹ year⁻¹. The former creates an approximate 50% waste recovery goal of 1250 pounds person⁻¹ year⁻¹, the latter a goal of approximately 1350 pounds person⁻¹ year⁻¹.

The only municipality that exceeds either of these goals is East Hampton. The per capita data for the East End Towns, as discussed in earlier reports, are based on year-round resident data, and therefore does not account for summertime population increases (which would lower the per capita calculations). None of the other municipalities are especially close to the goal based on the larger waste stream estimate. However, if achieving 90% of the goal, which for the lower waste stream size would be approximately 1100 pounds person⁻¹ year⁻¹, is considered to be

noteworthy, then a host of Long Island municipalities may be considered to have come close. These are Hempstead in Nassau County, and Huntington, Islip, Shelter Island and Southampton in Suffolk County. Suffolk County (as a whole) has approximately 1100 pounds person⁻¹ year⁻¹ recovery credits. Note that inclusion of unallocated recycling credits on the County levels make the County estimates higher than a population weighted mean derived from the individual municipalities.

That last point suggests that if the State were to place great stock in municipalities achieving the recovery goal, manipulation of the unallocated credits might provide the five municipalities that fall just short of the goal enough tonnages to meet the goal. Certain other municipalities might use those data similarly to suggest that they have not missed the State goal by very much.

However, most waste stream data are presented in terms of percentages. The State goal is in that format. We have been loathe to assign percentages to the municipalities because of deficiencies we believe exist in many municipal waste stream definitions. Nonetheless, the public, the State, and the municipalities will most probably make judgements based upon the percents calculated for each municipality, and not on some indirect figure as we have constructed.

Therefore, we have created Tables 6 and 7. Table 6 gives a summary of waste management, in tons, as projected for 1997. The waste stream is presented in terms of the solid waste hierarchy (with landfilling omitted, as it is banned under the Long Island Landfill Law). As

we have suggested, the sums of materials managed by the municipalities in total do not sum to the entire Long island waste stream. This is to be expected, given that we have not allocated 150,000 tons of recycling credits to any particular municipality. An additional 400,000 tons is not accounted for in this reckoning, however. One interpretation of the missing wastes is they are the wastes managed by the private sector outside of municipal pathways. These solid wastes are presumed to be disposed, since private recycling has been included in the estimations for the municipal waste streams.

Table 6. Projected 1997 Waste Management, by Municipality (in tons)

	Waste Reduction	Recycling	Total Recovered	MSW Disposed	Total Waste Stream
Nassau County	10000	625000	650000		1750000
Glen Cove		5500	5500	18500	24000
Hempstead		400000	400000	470000	870000
Long Beach		6500	6500	24000	30500
North Hempstead		65000	65000	170000	235000
Oyster Bay	11000	90000	100000	175000	275000
Suffolk County	120000	600000	700000		1750000
Babylon	7500	60000	70000	200000	270000
Brookhaven	41000	145000	190000	200000	390000
East Hampton		11000	11000	14500	25500
Huntington	19000	90000	105000	150000	255000
Islip	30000	130000	160000	150000	310000
Riverhead	2300	8000	10000	15000	25000
Shelter Island	225	1100	1300	1100	2400
Smithtown	11000	40000	50000	87000	137000
Southampton	4500	21000	25000	16000	41000
Southold	2000	8000	10000	15500	25500
Long Island Total	125000	1225000	1350000	1750000	3500000
Percent of Waste Stream	4%	35%	39%	50%	

Table 7. Projected 1997 Waste Stream Recovery Rates for Long Island Municipalities

Nassau County	37%
Glen Cove	23%
Hempstead	46%
Long Beach	21%
North Hempstead	28%
Oyster Bay	36%
Suffolk County	40%
Babylon	26%
Brookhaven	49%
East Hampton	43%
Huntington	41%
Islip	52%
Riverhead	40%
Shelter Island	54%
Smithtown	36%
Southampton	61%
Southold	39%
Long Island Total	39%

Table 7 shows three Suffolk municipalities with greater than 50% recycling: Southampton, Shelter Island, and Islip. Southampton has a 61% projected recycling rate. The Town has chosen to restrict the portion of its waste stream that it will manage (and this, rather than the "Pay-per-Bag" collection arrangement, is the factor that minimizes the amount of waste disposed in our estimation). Shelter Island has restricted its waste disposal through a "Pay-per-Bag" program, leading to a precipitous decline in its waste stream. Our projection for Islip is based on waste disposal only at the Town's incinerator, which is not believed to be capable of managing the Town's entire waste disposal needs. All three Towns are projected to exceed the State waste diversion goal, however.

Two other municipalities appear to come close. Brookhaven is projected to have a 49% waste diversion rate -- and presumably could find the small amount of credits to claim a 50% rate if that were to be necessary. Brookhaven, by increasing tip fees for disposal, has effectively limited its waste disposal to the Town's contracted-for residential waste stream. The other municipality which achieves 90% of the 50% diversion rate is Hempstead (at 46%)³. This result is not due to restricting the waste disposed by the municipality, but rather by aggressively claiming and estimating as many recycling credits as possible.

Three other Suffolk County municipalities appear to be in position to claim 40% or more recovery rates: East Hampton (projected to recover 43%), Huntington (projected to recover 41%), and Riverhead (projected to recover 40%).

Overall, however, most waste planners do not appear to have faced the possibility of State application of the 50% recovery goal to something more than public planning. Those who have often suggest something in line with sentiments voiced by John Trent of Smithtown. Smithtown, he said, will meet the 50% goal for 1997 "depending on what I count" (Trent, 1995).

³ Note that 90% of 50% = 45%.

Conclusions

The discussion of Solid Waste Management Plans (SWMPs) revealed that they are the empty shell of a planning program on Long Island. Although the NYSDEC can claim administratively that 12 of the 13 eligible municipalities (in 1995) had either "accepted" or "submitted and under review" SWMPs, at least half of the seven accepted SWMPs had plans that centered on approaches that were no longer considered reasonable, and two of the other three did not appear to be likely to meet the 50% waste reduction goal under current operations.

We believe that the SWMP process has lost its purpose in a mist of regulatory rule-making, for Long Island. It would seem that the theoretical reason for a SWMP is for public planning purposes. However, pragmatic uses of the process seem to be primarily post hoc justifications for facility construction (East Hampton may be an exception to this rule). An example of the failure of SWMPs on Long Island is Oyster Bay. The Town seems to be genuinely

perplexed over the direction it should take in waste management. However, instead of embarking on the SWMP process to investigate possibilities, the Town has decided not to write a SWMP until it has decided on its course (Swenson, 1994a). This seems to be due to the detail required to achieve an acceptable SWMP, and the complexities of the process. It also springs from the rigidity of the SWMP once accepted. If the entire process must again be entered into with changes in facility planning or waste stream approaches, in an atmosphere heavy with regulatory compliance, a municipality investigating possibilities stands to imitate Brookhaven, and go through several expensive SWMP submission iterations. It is far better to decide on an end, and write the SWMP that justifies the choice. Without indicting the named municipalities for such cynicism, that could be the interpretation of the course of the process in Hempstead, Huntington and North Hempstead, for example.

It would seem that municipalities and their citizens (particularly those activist citizens who have an interest in solid waste matters) would be better served by a more informal process. This could involve the production of plans with tens (rather than hundreds) of pages, which acknowledge the fluidity of purpose required in modern waste management (to address crises such as the Carbone decision). If these documents were open-ended, they could provide means for community input into major solid waste planning decisions -- as seems to be the intent of the current SWMP regulations, although that seems to rarely be the reality.

However, the SWMPs, flawed as they may be, were useful in reaching estimates of 1997 waste management for Long Island, as they described major facility construction plans. The estimates are based on the 1994 data we collected from the municipalities themselves, and on reasonable augmentations of those statistics.

The estimates illustrate a failure in the State mandate: the 1997 50% waste recovery goal was set without defining what could be counted, what should be counted, and what should not be counted. As best as can be determined, however, Long Island as a whole will not meet the State 50% recovery goal for 1997 (considering its entire waste stream). That is not particularly surprising to anyone with more than a passing acquaintance with Long Island solid waste matters. However, it may be surprising to determine that Long Island could have nearly a 40% recovery rate by the end of 1997.

For the individual municipalities, projections based on self-defined waste streams indicate that three municipalities could exceed the 50% recovery goal (Southampton, Shelter Island and Islip). When a pounds per capita waste recovery measure (compared to Long Island-wide waste generation rates) is used, one other municipality seems to be headed towards meeting the State mandate (East Hampton). Three other municipalities appear to be in line to achieve better than 90% of the recovery goals (Brookhaven, Hempstead and Huntington), and so may be able to manipulate the data slightly to show compliance (or may claim to be close enough to the intended rate for the difference not to matter). These seven municipalities account for 65% of Long Island's population. This is true although the sum of waste reduction in our estimates will be

approximately 4% Long Island wide (which is less than half of New York State's intended 8 - 10% waste reduction credit in 1997). This suggests that the effects of waste reduction are not as well accounted for in our estimate as the State had forecast.

For some of the Long Island municipalities, it may be difficult (at least, by travelling along the paths we took) to reach the State goal. Nonetheless, Long Island appears to be able to say it has done much better in straining for this goal than could have been imagined in 1986, and, indeed, than many would have imagined in 1994. The achievements we have documented here, although some may appear to be paper recoveries or accounting tricks, are on the whole authentic (if somewhat underdocumented in some cases). Recycling and waste reduction represent mammoth effort, and management of some 35 - 40% of the waste stream for Long Island. In an unfair but irresistible comparison, Long Island has spent nearly \$1 billion in capital to build its WTE incinerators (recycling efforts are much less capital intensive than disposal efforts). The incinerators manage some 45% of the waste stream (Tonjes and Swanson, 1997).

Acknowledgements

Thanks are due to all the individuals who most graciously provided the information contained in the overall report. They were unstinting of time and effort. Opportunities provided by Jim Heil to be involved in the nitty-gritty of local solid waste planning processes and on-going efforts by Sam Kearing and Tom Wickham to keep WRMI involved in overall Long Island waste planning efforts have been much appreciated.

We would also like to thank our reviewers of the initial version of the overall report, notably Vincent Breslin (The University at Stony Brook) and Carolyn Zenk (The Group for the South Fork), for their perceptive comments.



References

- A.A. & M. Carting Service et al. v. Town of Babylon, New York et al., and USA Recycling, Inc. et al. v. Town of Babylon, New York et al. (consolidated cases). 1995. United States Court of Appeals for the Second Circuit, New York, NY.
- Ain, Stewart. 1995. Glen Cove tries to stop contractor from reopening City incinerator. The New York Times. March 12, Long Island Weekly, pp. 1, 6, 12.
- C&A Carbone, Inc. et al. v. Town of Clarkstown et al. 1994. United States Supreme Court, Washington, DC.
- CSI Resource Systems, Inc. 1993. Town of Hempstead Solid Waste Management Plan. CSI Resource Systems, Inc., Boston, MA.
- Cassese, Sid. 1996. Incinerator's closing leaves residue of cost. Newsday. December 13, p. A33.
- Dvirka and Bartlucci. 1993. Town of Huntington Draft Solid Waste Management Plan and Generic Environmental Impact Statement. Dvirka and Bartlucci, Syosset, NY.
- Malcolm Pirnie. 1993. Design, Construct, Operate and Maintain a Solid Waste Recycling and Composting System. Draft Request for Proposals. Town of Southampton, Southampton, NY.
- Moore, Elizabeth. 1995. The neighbors want to know: watts up? Newsday. March 10, p. A35.
- New York State Department of Environmental Conservation. 1995. Draft New York State Solid Waste Management Plan 1995-1996 Update. New York State Department of Environmental Conservation, Albany, NY.
- New York State Department of Environmental Conservation. 1993. 6 NYCRR Part 360: Solid Waste Management Facilities. New York Department of Environmental Conservation, Albany, NY.
- New York State Department of Environmental Conservation. 1987. The New York State Solid Waste Management Plan. New York State Department of Environmental Conservation, Albany, NY.
- Romaine, Edward P. 1995. An ill-suited composting plant. Newsday. May 19, Letter to the Editor, p. A53.
- SSC Corp. v. Town of Smithtown et al. 1995. United States Court of Appeals for the Second Circuit, New York, NY.
- Slackman, Michael. 1996. Incinerator closer to going up in smoke. Newsday. May 7, p. A54.
- Thomas, Jo. 1994. After growing in success, recycling faces obstacles. The New York Times. November 27, Main News Section, pp. 1, 44.
- Tonjes, D.J. 1993. Town of Brookhaven Revised Solid Waste Management Plan. Town of Brookhaven, Medford, NY.
- Tonjes, D.J. 1995. Town of Brookhaven Solid Waste Management Plan Compliance Report. Town of Brookhaven, Medford, NY.
- Tonjes, D.J. and R.L. Swanson. 1997. Extending the Definition: Waste Reduction, and Municipal and Private Sector Recycling Rates on Long Island in 1994: Part IV of an Assessment

of Recycling on Long Island. Special Report # 120. Marine Sciences Research Center, The University at Stony Brook, Stony Brook, NY.

Tonjes, D.J. and R.L. Swanson. 1996a. Doing the Right Thing: Municipal Recycling Programs on Long Island in the 1990s: Part I of an Assessment of Recycling on Long Island. Special Report # 116. Marine Sciences Research Center, The University at Stony Brook, Stony Brook, NY.

Tonjes, D.J. and R.L. Swanson. 1996b. Comparing Apples and Oranges: Municipal Recycling Tonnages and Rates on Long Island in the 1990s: A. The Data Report: Part II of an Assessment of Recycling on Long Island. Special Report # 117. Marine Sciences Research Center, The University at Stony Brook, Stony Brook, NY.

Tonjes, D.J. and R.L. Swanson. 1996c. Comparing Apples and Oranges: Municipal Recycling Tonnages and Rates on Long Island in the 1990s: B. The Data Analysis: Part II of an Assessment of Recycling on Long Island. Special Report # 118. Marine Sciences Research Center, The University at Stony Brook, Stony Brook, NY.

Tonjes, D.J. and R.L. Swanson. 1996d. Plumbing the Unknown: Recycling Practices, Tonnages and Rates in the Private Sector on Long Island in the 1990s: Part III of an Assessment of Recycling on Long Island. Special Report # 119. Marine Sciences Research Center, The University at Stony Brook, Stony Brook, NY.

Tonjes, D.J. and R.L. Swanson. 1992. Where Does It All Go? The Size and Method of Disposal of Long Island's Solid Waste 1986 and 1991. Special Report #103, Marine Sciences Research Center, The University at Stony Brook, Stony Brook, NY.

Town of Babylon. 1995. 1994 Town of Babylon Recycling Activities. Town of Babylon, Babylon, NY.

Town of North Hempstead. 1993. Town of Babylon/Town of North Hempstead Solid Waste Management Plan/Generic Environmental Impact Statement. Town of North Hempstead, Port Washington, NY.

Town of Oyster Bay. 1995. Town of Oyster Bay Solid Waste Management Plan Compliance Report. Town of Oyster Bay, Oyster Bay, NY.

Vitale, David. 1993. Comments on the Town of Brookhaven Revised Solid Waste Management Plan and Comprehensive Recycling Analysis Update. In: Tonjes, D.J. 1993. Town of Brookhaven Revised Solid Waste Management Plan. Town of Brookhaven, Medford, NY.

Personal Communications

Baker, Judith. 1996. Recycling Coordinator, Recycling Office, Town of Southampton, NY.

Bullock, Tony. 1992, 1994. Supervisor, Town of East Hampton, NY.

Bunchuck, Jim. 1994. Supervisor, Department of Public Works. Town of Southold, NY.

Cogen, Richard. 1994. Partner, Nixon, Hargraves, Devan and Doyle, Albany, NY.

Cowen, Ray. 1993. Regional Director, Region I, New York State Department of Environmental Conservation, Stony Brook, NY.

Gablantz, Monique. 1991. Deputy Supervisor, Town of Riverhead, NY.

Garnham, Peter. 1996. Recycling Information Officer, Town of East Hampton, NY.

Groben, Michael. 1995. Acting Commissioner, Department of Waste Management, Town of Brookhaven, NY.

Heil, James. 1994, 1995a. Commissioner, Department of Waste Management, Town of Brookhaven, NY.

Heil, James. 1995b. Chief Operating Officer, Quality Resource Corporation, Plainview, NY.

Kluesener, Ronald. 1994. Commissioner of Environmental Control and Administrator of Solid Waste, Town of Babylon, NY.

Miner, Matthew. 1994. Deputy Executive Director, Town of North Hempstead Solid Waste Management Authority, Town of Hempstead, NY.

Scully, Peter. 1994, 1996. Commissioner, Department of Environmental Control, Town of Islip, and President, Islip Resource Recovery Agency, Town of Islip, NY.

Sherman, Huson. 1994. Supervisor, Town of Shelter Island, NY.

Swenson, Eric. 1994a. Superintendent of Environmental Control, Town of Oyster Bay, NY.

Swenson, Eric. 1994b. President, New York State Solid Waste Management Association, Albany, NY.

Trent, John. 1994. Solid Waste Coordinator, Engineering Department, Town of Smithtown, NY.



3 1794 02453253 4

DATE DUE

