SUFFOLK COUNTY SOLID WASTE MANAGEMENT REPORT AND RECOMMENDATIONS

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Introduction

While many people do not like to think about what happens to household refuse once it leaves their curb or they drive it to the local transfer station, Long Island faces a mounting crisis over what to do with the things we throw away.

The average Long Islander produces nearly four pounds of garbage each day, not including yard waste or recyclables. Traditionally, disposal has been a function of town governments, which have operated landfills to receive household garbage. However, since a New York State law ordered all Long Island landfills closed by the year 1990, Long Islanders have had to find alternative ways of disposing of their garbage.

Currently, about 35 percent of the waste stream is consumed at one of the Island's four waste-to-energy facilities. The remaining portion, about 1.1 million tons, is transported by truck to landfills in states such as Ohio, Pennsylvania, and Virginia at rates approaching $100 per ton. The practice of long haul trucking comes at an enormous price tag which is reflected in Long Island's property tax bills or transfer station fees or bag fees in several eastern Suffolk Towns. Even a small percentage reduction in Long Island's one billion dollar waste disposal costs could save tens of millions of dollars.

Citizens also pay for garbage trucking indirectly through increased air pollution, traffic congestion, road maintenance, and equipment acquisitions. Long-haul trucking emits substantial volumes of diesel fumes containing gases that contribute to global warming and particles linked to cancer and childhood asthma. The American Lung Association, in its *State of the Air Report 2006*, gave Suffolk County a failing grade for ozone pollution. Ground level ozone produced from nitrous oxide gas emissions can damage lung tissue. Particulate emissions from diesel fumes can cause respiratory illness and cancer. The Clean Air Task Force, a non-profit scientific research and advocacy organization, reported that the lifetime cancer risk from diesel soot in Suffolk County exceeds the EPA's acceptable risk level by 360 times. In fact, diesel soot exceeded the lifetime cancer risk of all other air toxins tracked by the EPA combined.

Action must be taken now or things will only get worse. Stony Brook University's Waste Reduction and Management Institute projects the Long Island waste stream to increase to six million tons per year in 2009. The municipal agreements governments have with the waste-to-energy facilities are beginning to expire and Long Island may be faced with transporting anywhere from 38 to 100 percent of its waste off-island unless additional capacity is added to process waste.

As an alternative to trucking, private industry has been acquiring the infrastructure to begin shipping waste by rail. Today only a small amount of household waste is being moved through rail transport. However, rail holds the promise of significantly lower transport costs without the traffic and with far less pollution than long-

haul trucking. Rail also allows cost efficient transport to more remote disposal locations where landfill tipping fees may be lower. These cost reductions will likely translate to savings to residents. However, many states are considering prohibitions on landfills. Therefore, rail transport may only be a short-range solution and Long Island may have to processes its waste within its borders.

Other areas facing a similar dilemma are exploring new technologies for waste process. Many of these technologies are discussed within this report. One promising technology called Plasma Arc converts waste to electricity in a closed system without contributing to air pollution or global warming. A small system is now operating in Connecticut and a larger scale system is being constructed in Florida.

Another partial solution to our garbage conundrum is simply to produce less. This may be achieved through more aggressive recycling and reuse programs. Some municipalities have enacted financial incentives for recycling. Five percent of Suffolk County's residents live in areas where municipal government charge a volume-based fee on individual homeowners to dispose of non-recyclable materials. These "pay as you throw" programs charge no cost for disposal of recyclables. These programs have led to significant reductions in volume of non-recyclable waste. Other areas have tried public education campaigns to promote recycling with lesser success.

The time is overdue for Suffolk County to develop and implement a comprehensive solid waste management plan. In an effort to explore the issues in detail and provide some direction for the future, I introduced Resolution 683-2006 creating the Suffolk County Legislature's Regional Solid Waste Management Commission. The Commission's goals were to explore ways to reduce pollution, traffic congestion, and the financial impact of current solid waste disposal practices.

The Commission consisted of government, non-profit, and private-sector experts who conducted a top-down review of waste disposal practices and evaluated the financial and environmental benefits of new waste management and transportation approaches in Suffolk County. The Commission's findings are contained in this report.

Special mention must be made in gratitude to certain individuals, without whom none of this would have been possible. First I would like to thank Presiding Officer William Lindsay, along with Legislators Wayne Horsley, Vivian Viloria-Fisher, and Steven Stern for their support and participation in the Commission. Additional thanks are due to Commissioner Carrie Meek Gallagher of the County's Department of Environment & Energy, who served as our Commission's chair.

I would also like to thank the individual members of the Commission, whose names have been included in this report. The work of Professor Larry Swanson, Director of Stony Brook's Waste Reduction and Management Institute; and James Heil of Cashin Associates is deserving of extra recognition for their continuous assistance outside of the Commission's regular meetings. Both they and John Waffenschmidt of

Covanta Energy provided invaluable data and insight that permeates our collective work.

Finally, I record my deep appreciation to George Proios, Chief Environmental Analyst for Suffolk County's Division of Recycling and Waste Management. George graciously devoted both his expertise and countless hours of his time. His immeasurable help, from the Commission's infancy to the final preparation of this report, will not be forgotten.

The results of this long effort hold the promise for Suffolk County to play a leadership role in transitioning from the current system of trucking and landfilling to a new environmentally and economically responsible regional approach. Considering the recommendations of the following report constitute the most important first steps we can take together.

Jay H. Schneiderman
Suffolk County Legislator
Second District

Suffolk County Regional Solid Waste Management Commission

Goals Reduce pollution
Reduce traffic congestion
Reduce financial impact of current solid waste disposal practices

Legislative Charge

1. Review, analyze and evaluate current regional solid waste disposal practices in Suffolk County;
2. Evaluate the financial and environmental benefits of new technologies for their use in Suffolk County;
3. Recommend alternatives to current practices that are both environmentally and economically beneficial;
4. Seek ways to reduce air pollution;
5. Seek ways to reduce traffic congestion;
6. Investigate disposal methods with lower and/or more predictable costs, and evaluate alternatives to decreased trucking such as rail and barge;
7. Examine ways to promote recycling and market development for recycled goods;

Other Key Points

1. Solid waste shall include: municipal and private solid waste; construction and demolition debris (C&D); yard waste; sewage; sludge; other waste by products
2. Commission may seek additional expertise from experts and conduct field investigations.
3. Commission may request consultants to assist, and incur travel expenses, not to exceed $5,000.
4. Commission shall hold regular meetings, determine its own rules, and keep a record of all meetings.
5. Ten members of the Commission constitute a quorum.
6. Commission may conduct informal hearings at any place within the County.
7. Clerical services will be provided by the staff of the County Legislature.

Commission Membership

1. Commissioner of Department of Environment and Energy

   Carrie Meek Gallagher Chair

2. Commissioner of Department of Public Works

   Gil Anderson

3. Commissioner of Department of Economic Development and Workforce Housing

   Jim Morgo

   Designee: Lisa Broughton

4. Chair of Environment Planning and Agriculture Committee

   Legislator Vivian Viloria-Fisher

5. Chair of Economic Development and Energy Committee

   Legislator Wayne Horsley

6. Chairman of Public Works and Transportation Committee

   Legislator Jay Schneiderman

7. Representative of New York State Department of Environmental Conservation who has expertise in solid waste regulations

   Peter Scully, Regional Director

8. Representative of the Waste Reduction and Management Institute at SUNY

   Dr. L. R. Lawrence Swanson, Director

9. Expert in rail transportation expert

   Don Nohs

10. Expert in municipal and commercial Recycling

    (Vacant after Neil Sheehan moved to Brookhaven)

11. Director or representative of a large scale successful municipal solid waste program in Suffolk County

    John Kowalchyk, Town of Brookhaven Department of Waste Management

12. Solid Waste Engineer

    James H. Heil, Environmental Engineer, Cashin Associates P.C.

13. Representative of Cornell Cooperative Extension

    Thomas B. Williams *Executive Director, (631-727-7850 ext 306*
    Michael Desgaines, alternate

14. Representative of the Suffolk County Village Officials Association

    Joshua Y. Horton, Executive Director
    (Never Attended)

15. Representative of an Environmental group appointed by the Legislature

    Marcia Bystryn, League of Conservation Voters

16. Representative of the Suffolk County Supervisors Association

    George Hoffman

17. Representative to be chosen by the Presiding Officer of the Legislature

    John Waffenschmidt, Covanta Holding Corporation

18. Representative of the Long Island Sanitation Officials Association

    James Bunchuck, President

Also had voluntary representation from the Nassau County Executive's office, and New York State Solid Waste Commission.

SOLID WASTE COMMISSION RECOMMENDATIONS

COUNTY

1. Suffolk County should be a role model in waste reduction, reuse and recycling. It should develop and implement recycling plans for all of its facilities, purchase recycled materials, and aggressively reduce all wastes.

2. Suffolk County should promote volume-based pricing programs such as the pay-to-throw programs currently in use in many localities throughout the nation.

3. Suffolk County should encourage development, recruitment, and retention of firms that will manufacture new products from materials recovered from the waste stream.

4. Suffolk County should encourage the creation and use of high quality recycled materials to better secure and stabilize markets and obtain the most favorable prices. For example, the County could consider acting as a broker for the towns with buyers of recycled materials.

5. Suffolk County should support environmentally responsible alternatives to the long-haul trucking of waste, including the possibility of new clean technologies for processing waste on Long Island.

6. Suffolk County should encourage research and development at local universities and research facilities on all aspects of waste management, including recycling, new technologies, and new uses for recovered materials.

7. Suffolk County should establish a yard waste composting demonstration project at the county farm in Yaphank and utilize composted material at county fields and parklands.

8. Suffolk County should evaluate and develop a coordinated response to the proposed New York State Solid Waste Management Plan and the associated Solid Waste Management Facilities Regulations (Part 360).

9. Suffolk County should work with the state, local governments, and school districts to implement curriculum on waste management and reduction in all local school districts.

TOWNS

1. Towns and villages should ensure enforcement of local solid waste laws to increase recycling participation at institutions, commercial facilities, and multi-family residences.

2. Municipalities should consider incentive-based programs to increase recycling rates, and all new site plans should have recycling recommendations incorporated into their final approvals.

NEW YORK STATE

1. Waste-to-energy technologies should be included as a renewable resource in New York State's renewable portfolio standard (RPS) in order to enable these facilities to receive better economic support.

2. Promote tax incentives that would encourage Long Island municipalities and businesses to process their waste and recyclables on Long Island.

3. Encourage the development and expansion of markets for recyclables such as glass and ash.

4. With all local solid waste plans (SWMPs) due for renewal in the next several years, NYSDEC should increase planning and implementation assistance to towns and planning units preparing new plans.

OTHER ENTITIES

The Long Island Regional Planning Board, with funding from Nassau and Suffolk Counties, should undertake a comprehensive study of the solid waste issues for Long Island:

a) This should include a detailed study of the waste stream, including the number of facilities, tonnage, processing, recycling, means of transport, means and location of disposal, and accurate economic data.

b) Help develop with the two Counties and local municipalities, an accurate and ongoing database that includes detailed economic information relating to all segments of solid waste management, including ash and construction and demolition material.

THE EVOLUTION OF THE ROLE OF GOVERNMENTS IN MANAGING SOLID WASTE ON LONG ISLAND

Over the past 25 years, Long Island has experienced a fundamental change in the relative roles played by the public and private sectors in the management of solid waste, a situation which remains unsettled as it relates to the future roles and responsibilities of government and private facilities. As a result, the extent and nature of governmental involvement in waste management activities varies by town in Suffolk County, with some towns directly managing both collection and disposal of both residential and commercial solid waste streams, and others playing virtually no role in either collection or disposal activities. In addition, because waste streams are managed by a wide variety of means and facilities, both public and private, accurate data regarding the quantities of waste and recyclables generated in each municipality and the region as a whole is not attainable.

Since the enactment of the two state laws which guide solid waste management activities in Suffolk County, the Long Island Landfill Law of 1983, and the Solid Waste Management Act of 1988, a combination of factors has led to a fundamental shift in the roles of local governments and the private sector relating to the collection, transportation, and disposal of solid waste and recyclables. The result is significant variations in the level of involvement on a day-to-day basis in waste management activities among the town and village governments in Suffolk County. This includes an increased reliance on both private sector haulers and processors, and, more significantly, a growing dependence on disposal facilities in other states which accept thousands of tons each day of Suffolk County's solid waste.

Since the enactment by Congress of the Resource, Conservation and Recovery Act (RCRA) in 1976, the regulation of solid waste management by government has been built on the premise that government has a basic responsibility to protect public health, safety, and the environment by ensuring the proper management and disposal of solid waste. Inherently, government assumed to have not only the responsibility, but the right and authority to control solid waste in order to fulfill its obligations in this regard. Throughout the 1980s, state governments across the United States underscored this premise by granting specific authority to localities, including many on Long Island, to enact "flow control" ordinances as part of their plans to comply with state and federal mandates requiring sound management and disposal of solid waste.

For local governments to comply with the Long Island Landfill Law by moving toward waste-to-energy (the preferred alternative to landfilling), identified as "resource recovery" in both state and federal law, this flow control was critical. The cost of resource recovery facilities, approximately $200 million for the shared Huntington-Smithtown facility, constituted the largest public works project undertaken, by town governments. For the financial institutions which sold the bonds via the towns Industrial

Development Agencies, to finance the facilities, protecting the bondholders by ensuring the economic viability of the project was paramount. The bonds would be redeemed by revenue generated by disposal fees for waste brought to the facility and by the sale of electrical power sold under contract to LIPA. Because the disposal fees at the new facilities would exceed those historically charged for local landfill disposal, strong efforts were established to ensure the adequate revenue flow to the facilities. These efforts included local flow control laws, contracts with incorporated villages and collection districts, and direct control of waste collection by means of municipal collection or contracting with commercial carters to serve residential areas on behalf of the town.

Even in the face of these legal underpinnings, the local government role in managing, and specifically in the disposal of, non-recyclable portions of the waste stream, began to change in the mid-1980s as towns on Long Island began to come to grips with the practical implications of the Long Island Landfill Law, which held as its primary requirement the virtual elimination of solid waste landfills in the region. Efforts by towns to expand existing landfills were rejected by the New York State Department of Environmental Conservation.

In Islip, the Town sought to put political pressure on the State, and to conserve limited space in its Blydenburgh Landfill, by simply closing the landfill to commercial waste and accepting only waste generated by the Town's residential collection districts. For the first time, private sector haulers were essentially being told by government that they would need to make their own arrangements for the disposal of waste they were collecting, a situation that gave rise to the journey of the infamous "Garbage Barge", the Mobro, which, loaded with 3,200 tons of Long Island's solid waste, traveled for months in search of a disposal site before coming back to Queens to be processed under a deal brokered by the State DEC.

In Oyster Bay, the Town requested a hearing before the DEC Commissioner on the denial of its landfill expansion. They argued that if the denial were sustained, the Town would be forced to ship its garbage out of New York State for disposal, an option which, at the time, the Town insisted, would place an unfair burden on Town taxpayers. Transportation and disposal costs were projected to approach $250 per ton, at a time when landfill disposal fees on Long Island were in the range of $20. In his decision, Commissioner Henry Williams upheld the denial of the landfill expansion and indicated that exporting of waste off Long Island was a reasonable alternative.

The responses to these actions set in motion a trend in which local government have become increasingly reliant on the ability to move waste off Long Island to meet disposal needs. In addition, many of those governments which made investments in waste-to-energy facilities did not oppose the expanded role of the private sector hauling industry in managing garbage during the period that local landfill space was no longer available and the new facilities were not yet completed and available as an alternative. Private sector haulers, becoming more efficient in the transportation of the waste, by creating a new type of facility, the "transfer station" to shift waste from collection

vehicles to larger, 18-wheel tractor trailers capable of transporting over 30 tons for long trips. The haulers secured their own contractual arrangements with landfills in Pennsylvania, Ohio and Virginia, among other states, to ensure their ability to dispose of the waste collected from their customers on Long Island. For the first time, hundreds, and ultimately, thousands of tons of waste began to be managed outside local municipalities, and absent any local governmental involvement. This would be an issue that would become a problem for some local governments when the their new waste-to-energy facilities were completed and they needed the waste leaving Long Island to feed the facilities and provide the revenue stream necessary to pay off the debt for the facilities.

At the same time, towns which had not moved to develop new facilities were confronted with a new alternative to landfilling. Siting and financing a resource recovery facility carried with it significant political risks. Unlike landfills, which could accommodate varying amounts of waste each day, resource recovery facilities were designed to operate on a steady, fixed capacity of waste, and required fixed minimum stream of waste to remain viable. For towns in eastern Suffolk County, which had dramatic seasonal shifts in population and resultant solid waste generation, fixed-capacity systems were a poor fit to their needs. The Town of Brookhaven entered into a landmark inter municipal agreement (IMA) with the Town of Hempstead, under which Brookhaven transports its waste to the Hempstead Resource Recovery facility for processing, and accepts the ash or back for disposal at the Brookhaven Landfill. While the agreement does accommodate Brookhaven's residential waste stream, a significant portion of the commercial waste stream in Brookhaven is managed by the private sector, without governmental involvement.

By the mid 1990s, transportation and disposal costs for waste exported off of Long Island had dropped to the range of $70 to $80 per ton. Towns on Long Island found that simply undertaking competitive bidding for transportation and disposal had become a cost-effective and politically expedient alternative to siting and financing new waste to energy facilities. In some cases, responding bidders proposed transportation of waste and/or ash from Long Island as far as Utah. A complex variety of management schemes, some involving private operation of municipal transfer facilities, others relying entirely on private sector entities to manage waste from collection though disposal emerged to compliment the new waste-to-energy facilities developed by the towns that made decisions to invest in their own facilities to comply with solid waste mandates.

In Suffolk, the towns of Babylon, Brookhaven, Islip, Huntington, and Smithtown have their own waste management facilities, and are directly involved in collection and disposal activities. On the East End, while some towns have facilities used to transfer waste to larger vehicles for export, there are no disposal facilities for municipal solid waste. The towns rely on contractors for the removal of waste and disposal at out-of-town facilities. The Town of Riverhead has minimal involvement in the management of its waste stream, having made a decision to contract the collection and disposal to the private sector.

The waste management system has evolved from one in which nearly all the municipal solid waste generated in Suffolk County was managed at on-island municipal facilities, to a more diverse system which relies on private sector facilities which receive waste from more than one municipal jurisdiction. These private facilities may not quantify or record waste volumes, making quantification of the waste stream with any degree of accuracy nearly impossible. The region's growing reliance on shipping waste to other states for disposal raises significant long-term concerns. The New York State Solid Waste Management Board noted in its 1997 Report to the Governor and Legislature:
Suffolk County's local governments cannot control the market they depend on, and may face significantly higher costs or import restrictions imposed by receiving states.

"The reality is that the reliance on out-of-state disposal options means that the State is not in control of its own destiny as it relates to solid waste disposal. Should receiving states be successful in their efforts to obtain authority to restrict or tax solid waste imports, New York State could find itself facing an instant logistical, economic and environmental crisis. In light of these facts, prudence dictates that New York State should begin planning to manage more of its solid waste within its own borders over the long term."

This observation is even more valid today as a result of the introduction of nearly 15,000 tons per day of New York City's solid waste into the export market, and rising cost of transportation tied to increased petroleum prices. Of all the regions in the State, Long Island is the most dependent on waste exports, and faces extreme challenges in siting even the most benign municipal facilities.

Long-term planning for greater self-sufficiency in the management of Suffolk County's solid waste stream should be a top priority.

NEW YORK STATE REGULATIONS
Solid Waste Management Facilities on Long Island

All solid waste collection, treatment, and management are regulated by the New York State Department of Environmental Conservation (NYSDEC) under the Title 6 of the Official Compilation of Codes, Rules and Regulations (6NYCRR) Part 360. The Part 360 regulation offers three levels of authorizations depending upon the activities. These are exemptions, registrations, and permits. Exempt activities generally are not tracked. The most common exemptions are for land clearing debris and small yard waste compost facilities.

When an activity meets certain requirements, such as waste type, ownership status (i.e., a municipality), throughput requirements, and/or other specific requirements depending upon facility type, a Registration may be obtained. Registrations do not require submission of any formal plans or engineering reports, as these activities are considered ministerial. The applicant is required to disclose a capacity and demonstrate that the said quantity of waste can be stored at the facility. Upon fulfilling the criterion for registration as outlined in the regulations, the Department validates the application.

Permits, however, require more in-depth applications which include engineering reports, plans, operations and maintenance manuals, and contingency plans, as well as any variance requests. The permit application is subject to the State Environmental Quality Review Act (SEQRA) and a public comment period is necessary, unlike a registration. The permit conditions are written for the specific design of the facility. The authorization types for each facility are discussed in more detail below.

Landfills

Landfills on Long Island are subject to regulation pursuant to 6 NYCRR Part 360-2 and 360-8, and are required to obtain a permit to operate. None of the landfills on the island qualify for a registration. Part 360-8 is specific to Long Island landfills and is based on the Environmental Conservation Law (ECL) 27-0704 - land burial and disposal in the counties of Nassau and Suffolk, The so-called the Long Island Landfill Law. Landfills on Long Island are prohibited from accepting municipal solid waste (MSW), unless it is downtime waste from a waste to energy (WTE) facility and is located outside the deep-flow recharge area.

Currently, there are five operating landfills on the Island, as summarized by Table I. The Blydenburgh Road Landfill of the Town of Islip and the 110 Sand Clean-fill Disposal Site landfill are located within the deep-flow recharge area, and may only accept “clean fill”, which is essentially construction and demolition debris (C&D). The Town of Babylon’s Ash Monofill and the Town of Brookhaven Landfill are location outside the deep-flow recharge area. The Town of Brookhaven accepts ash, C&D, downtime waste, and other untreatable wastes. All of the ash disposed of at facilities on the

Island comes from the local WTE facilities. The 1-A Hole Golf Course at the Port Jefferson Country Club contains a less than 2-acre C&D landfill exclusively used by the Village of Port Jefferson for disposal of brush, tree stumps and inert materials, and is located outside the deep-flow recharge area.

Waste-to-energy Facilities

On Long Island, there are four waste to energy (WTE) facilities, three are within Suffolk County and one within Nassau County, all authorized by permit. These WTE facilities, listed in Table I, must comply with the requirements of 6 NYCRR Part 360-3. Ash generated by these facilities is disposed of at either the Town of Babylon landfill or the Town of Brookhaven landfill.

The local WTE facilities do not have the capacity to incinerate all of the Island's MSW. As such, the remainder of the MSW is exported from the Island via trucks and rails to landfills located off Island. Much of the commercial waste stream is handled by private carters.

Transfer Stations

Transfer stations are regulated pursuant to 6 NYCRR Part 360-11. Authorizations are through either registrations, as summarized in Tables II and III, or permit as summarized in Table IV. Registrations are only available to municipalities, provided the transfer station accepts less than 12,500 tons per year or 50,000 cubic yards per year of solid waste. Many of the registered transfer stations are for a specific waste, highway department debris, or small facilities on the east end and small villages.

The transfer stations that do not qualify for a registration are required to have permits to operate. This includes all privately owned facilities, as well as the transfer stations located in the more populated towns. Often, a permitted transfer station activities are combined with recyclables handling and recovery (Part 360-12), and construction and demolition debris processing facilities (Part 360-16).

Recyclables Handling and Recovery Facilities

Recyclables handling and recovery facilities (RHRF) are regulated pursuant to 6 NYCRR Part 360-12. Facilities authorized with this activity only qualify for a registration, provided that the facility's residue is less than 15% of the waste stream; otherwise, the facility requires a permit. Solid wastes handled under this category are source separated recyclables such as paper, cardboard, plastic, metal, and glass.

A summary of the registered facilities can be found in Table V. As indicated above, it is also common for this activity to receive a permit. This is usually because it is part of a combined facility type summarized in Table IV.

Construction and Demolition (C&D) Debris Processing Facilities

C&D processing facilities are regulated by 6 NYCRR Part 360-16. Facilities that receive specific inert components from the C&D waste stream qualify for

registrations, regardless of the size of the facility. Many times the waste accepted may come from a permitted facility or directly from a job site. Solid waste accepted at a registered facility will be limited to uncontaminated asphalt, brick, concrete, rock, and soil; and/or unadulterated wood. Generally, all wastes entering are converted to useful end products such as recycled concrete aggregate for road base and mulch. Registered C&D processing facilities are summarized by Tables VI and VII.

For facilities that receive the whole C&D waste stream, a permit is required and these facilities are identified in Table IV. Certain recovered materials may be brought to a registered facility such as wood pallets and concrete. Many C&D processors on the island use a local landfill for final disposal of C&D residuals, such as Brookhaven which also accepts C&D screenings. C&D screenings consist of fine C&D that is screened out of the C&D waste stream and used as intermediate daily cover at a landfill.

Combination Facilities

It is common for a facility to take on characteristics of multiple facility types such as transfer, recyclables handling and recovery, and C&D processing. These facilities must follow the appropriate regulations from 6 NYCRR Part 360 - 11, 12, and 16 for their combined facility activities. These facilities may have been previously identified and are summarized in Table IV. There are generally multiple waste streams accepted at a given facility.

Compost Facilities

Compost facilities, summarized by Table VIII, are regulated under 6 NYCRR Part 360-5. Based on the material and/or volume composted, facilities may be exempt from regulation, require a registration, or a permit. A facility that accepts animal manure and one that accepts less than 3,000 cubic yards of yard waste per year are exempt from Part 360 regulation provided their operations do not unreasonably impact on neighbors. A facility that accepts more than 3,000 cubic yards, but no more than 10,000 cubic yards of yard waste per year; a facility that accepts no more than 1,000 cubic yards of source separated organic waste per year; and a facility that accepts food processing waste are eligible to be registered. Larger facilities, and facilities that compost other materials, such as mixed solid waste, or sludge, require permits. Generally, department staffs exercise closer oversight of permitted facilities, because of their size and potential for problems. Registered facilities are monitored less closely, and exempt ones are only monitored when problems arise.

Long Island Compost Corp. (LICC), a private entity, utilizes multiple agricultural farm lands, primarily located on East End, for yard waste composting. LICC has two permitted transfer stations for collection and distribution to farms. The

finished product is then removed from the farms and processed at their Yaphank facility.

Other Activities

In addition to MSW, C&D debris and recyclables, facilities that handle vehicle dismantling, used oil, grease traps, regulated medical waste and waste tires are also considered as solid waste management facilities. These activities are not included in the summary tables provided in this report.

Table I: Landfills and Waste to Energy Facilities on Long Island

Facility Name	Location Address	City/Town	Zip Code	Waste Types	Capacity	Service Area				
						Nassau	Suffolk	NYC	Other	Unknown
1-A Hole Golf Course - Port Jefferson Country Club	Old Homestead Road	Port Jefferson	11777	Land Clearing Debris;Brick;Concrete;Soil (Clean);Wood (tree limbs/branches);Wood (Trees/Stumps)	600 cyy	Vill of Pt Jeff Hwy Dpt				
110 Sand Company Clean Fill Disposal Site	Bethpage Spagnolli Rd.	Melville	11747	Clean Fill;Construction & Demolition Debris	6000 cyd	x	x	x		
Babylon North "U" Bypass	200 Patton Ave.	West Babylon	11757	Ash	450 tpd	Islip, Babylon				
Babylon Southern Ashfill	Edison & Gleam St.	West Babylon	11757	Ash	671 tpd	Islip, Babylon				
Blydenburgh Road Landfill Complex	440 Blydenburgh Road	Hauppauge	11788	Clean Fill	1450 tpd					
Brookhaven Waste Management Facility	350 Horseblock Road	Brookhaven	11719	Ash (WWTP Sludge);Ash MSW Energy Recovery Combined;Construction & Demolition Debris;Sewage Treatment Plant Sludge;Downtime waste;Unprocessible waste (residue). Note: Ash is from Hempstead and Huntington RRF.	2700 tpd 966,600 tpy	x	x	x		
Permitted Waste to Energy Facilities in Suffolk County										
Babylon Resource Recovery Facility	125 Gleam St.	West Babylon	11704	MSW (Residential/Institutional & Commercial)	750 tpd 273,750 tpy				Babylon	
Huntington Resource Recovery Facility	99 Towntine Rd	East Northport	11731	MSW (Residential/Institutional & Commercial)	750 tpd 273,750 tpy		x		Huntington, Smithtown	
MacArthur Waste-To-Energy Facility	4001 Veterans Memorial Highway	Ronkonkoma	11779	MSW (Residential/Institutional & Commercial)	485 tpd 189,067 tpy				Islip	
Permitted Waste to Energy Facilities in Nassau County										
Hempstead Resource Recovery Facility	600 Merchants Concourse	Westbury	11590	Industrial;MSW (Residential/Institutional & Commercial)	2550 tpd 925,000 tpy	x	x	x	Hempstead and other contracted Towns	

Notes:

1. Throughput units: cyd - cubic yard per day, cyy - cubic yard per year, tpd - tons per day, tpy - tons per year
2. Some facilities have an annual maximum throughput allowed. The Brookhaven Waste Mangement Facility is daily throughput based on 358 work days.
3. Town of Babylon has two permits for the landfill. The permits are for distinct parts of the site.
4. The Hempstead Resource Recovery Facility receives 4% of its throughput from NYC and 1% is industrial waste based on 2006 annual report.

Table II: Registered Transfer Stations in Nassau County

Facility Name	Location Address	City	Zip Code	Waste Types	Capacity	Service Area				
						Nassau	Suffolk	NYC	Other	Unknown
DPW Island Park	580 Long Beach Road	Island Park	11558	Yard Waste;Street Sweepings	200 cyd				x	
Freeport Transfer Station	175 Albany Avenue	Freeport	11520	Recyclables (Metal/Glass/Paper/Plastic);Clean Fill	1000 ???				x	
Incorporated Village of Lynbrook	DPW Crab Ave.;	Lynbrook	11563	Construction & Demolition Debris;White Goods	180 ???				x	
Keyspan Corporation	175 East Old Country Road	Hicksville	11801		N/A					x
Long Beach Recycling	Riverside Blvd. & Park Place	Long Beach	11561	Concrete;Asphalt;Wood (Clean);Recyclables (Metal/Glass/Paper/Plastic)	N/A				x	
Old Bethpage Trans. Sta.; Wood Waste Proc. Fac.; & Landfill	101 Bethpage-Sweet Hollow Rd	Old Bethpage	11714	Yard Waste	12,000 tpy yw				x	
Old Westbury Transfer Station	1 Store Hill Road	Old Westbury	11568	Yard Waste;Construction & Demolition Debris	10,000 cyy				x	
Plandorne Village Transfer Station	Stonytown Road	Plandorne	11030	Yard Waste;Street Sweepings	500 cyy				x	
Village of Floral Park - Pool/ Garage	Pool and Garage Road	Floral Park	11001	Land Clearing Debris;Wood (tree limbs/branches)	2000 cyy				x	
Village of Great Neck Transfer Station	Between 131-139 Steamboat Rd	Great Neck		Street Sweepings;Wood (tree limbs/branches);Yard Waste	100 cyd				x	
Village of Hempstead Transfer Station	450 Milburn Avenue	Hempstead	11550	Yard Waste;Construction & Demolition Debris	6400 tpy				x	
Village of Malverne Transfer Station	Pinebrook Lane	Malverne	11565	Yard Waste;Wood (tree limbs/branches);Wood (Trees/Stumps)	40 tpd				x	
Village of New Hyde Park	498 Stewart Avenue	New Hyde Park	11040	Recyclables (Metal/Glass/Paper/Plastic);Yard Waste	17.6 tpd				x	
Village of Westbury Transfer Station	500 Dover Street	Westbury	11590	Construction & Demolition Debris;Recyclables (Metal/Glass/Paper/Plastic);Yard Waste	10,000 cyy				x	

Notes:

1. Throughput units: cyd - cubic yard per day, cyy - cubic yard per year, tpd - tons per day, tpy - tons per year
2. The notation of the "Other" column for Service Area indicates that the waste accepted is from the respective town or village only.

Table III: Registered Transfer Stations in Suffolk County

Facility Name	Location Address	City	Zip Code	Waste Types	Capacity	Service Area				
						Nassau	Suffolk	NYC	Other	Unknown
Brookhaven Mastic Village	Mastic Beach Rd.	Mastic Beach	11951	Yard Waste;Street Sweepings;Land Clearing Debris	50,000 cyy				x	
Brookhaven Waste Management Facility	350 Horseblock Road	Brookhaven	11719-956	Yard Waste	49,000 cyy		x		x	
Fishers Island Transfer Station	Fisher's Island	Fishers Island	6390	Recyclables (Metal/Glass/Paper/Plastic);MSW (Residential/Institutional & Commercial)					x	
Hampton Bays Transfer Station	Jackson Ave.	Hampton Bays	11946	Recyclables (Metal/Glass/Paper/Plastic);MSW (Residential/Institutional & Commercial); Yard Waste	12,500 tpy				x	
Huntington Recycling Center	641 New York Ave.	Huntington	11743	Yard Waste	12,000 tpy				x	
Incorporated Village of Ocean Beach	Surfview & Bay Walks	Ocean Beach	11770	MSW (Residential/Institutional & Commercial)	n/a				x	
Miller Place Highway Yard	Miller Place-Yaphank Rd.	Miller Place	11764	Brick;Concrete;Street Sweepings;Wood (tree limbs/branches);Asphalt;Yard Waste	12,000 cyy				x	
Montauk Recycling Center	365 Montauk Highway	Montauk	11954	Recyclables (Metal/Glass/Paper/Plastic);MSW (Residential/Institutional & Commercial);Yard Waste	12,500 tpy				x	
North Sea Transfer Station	Majors Path	North Sea	11968	Recyclables (Metal/Glass/Paper/Plastic);MSW (Residential/Institutional & Commercial)	12,500 tpy				x	
Parkline Asphalt Maintenance	1877 Montauk Hwy	Brookhaven	11719	Street Sweepings	360 cyy	x	x			
Sag Harbor Turnpike Transfer Station	Sag Harbor Turnpike	Sag Harbor	11963	Recyclables (Metal/Glass/Paper/Plastic);MSW (Residential/Institutional & Commercial)	36 tpd				x	
Shelter Island Transfer Station	Bodwitch Road	Shelter Island	11964	Construction & Demolition Debris;MSW (Residential/Institutional & Commercial)	2500 tpy				x	
Smithtown Highway Yard	758 Smithtown Bypass	Smithtown	11787	Yard Waste	12,500 tpy				x	
Southold Trasnfer Station	County Road 48	Cutchogue	11935	MSW (Residential/Institutional & Commercial)	12,500 tpy				x	
Southold Trasnfer Station	County Road 48	Cutchogue	11935	Construction & Demolition Debris	3000 tpy				x	
Smithtown Municipal Services Facility	85 Old Northport Rd	Kings Park	11754	Construction & Demolition Debris	5000 tpy				x	
Westhampton Transfer Station	Old Country Road	Westhampton	11977	Recyclables (Metal/Glass/Paper/Plastic);MSW (Residential/Institutional & Commercial)	3000 tpy				x	

Notes:

1. Throughput units: cyd - cubic yard per day, cyy - cubic yard per year, tpd - tons per day, tpy - tons per year
2. The notation of the "Other" column for Service Area indicates that the waste accepted is from the respective town or village only.

Table IV: Permitted Transfer Stations, Recyclables Handling and Recovery Facilities, and C&D Processing Facilities on Long Island

Facility Name	Location Address	City/Town	Zip Code	MSW (ALL)	COMMERCIAL MSW ONLY	C&D	Recyclable	Yard Waste	Combined
NASSAU COUNTY									
County Carting	3550 Hampton Road	Oceanside	11572		300 cyd* (unit definitions provided at end)				
Daniel Finley Allen & Co Inc	114 Sylvester Street	Westbury	11590			1000 cyd			
Liotta & Sons	2824 Hampton Road	Oceanside	11572			600 cyd			
Merrick Transfer Station	1600 Merrick Road	Merrick	11566	x* (see notes)		x	x	x	1000 tpd
North Hempstead Transfer Station	999 West Shore Rd.	Port Washington	11050	x		x	x	x	1090 tpd
Oceanside Transfer Station	Long Beach Road @ Mott Street	Oceanside	11572					1000 tpd	
Old Bethpage Trans. Sta.; Wood Waste Proc. Fac.; & Landfill	101 Bethpage-Sweet Hollow Road	Old Bethpage	11714	28,500 tpm					
Omni Recycling of Westbury; Inc.	565 Covert Lane	Westbury	11590		775 tpd	300 tpd	250 tpd		
P & P Paper	311 Winding Road	Bethpage	11714				1250 tpw		
Rockville Center Transfer Station	10 Sunrise Hwy.	Rockville Center	11571	2700 tpm					
Sanitary District #1	Bay Boulevard	Lawrence	11559	x		x		100 tpd	400 tpd
Stony Creek Industries (Donna Lee Corp.)	4001 Daly Blvd.	Oceanside	11572			1000 tpd			
Testani Enterprises, Inc.	117 Magnolia Avenue	Westbury	11590			1000 cyd			
Valley Stream Transfer Station	200 Arlington Avenue	Valley Stream	11580	x			x		115 tpd
Vigliotti Enterprises	100 Urban Avenue	Westbury	11590					12,700 tpy	
Waste Management of New York - Glen Cove	100 Morris Ave.	Glen Cove	11542	x		x			800 tpd
SUFFOLK COUNTY									
All State Rubbish	26 Potter Avenue	Patchogue	11772			300 cyd			
Brookhaven Waste Management Facility	352 Horseblock Road	Yaphank	11980	313,000 tpy				10,000 tpy	
Brussels-Leir Holding Corp.	45 Garfield Ave.	Bayshore	11706			600 cyd			
Colossal Carting / S&P Sanitation	1026 Montauk Highway	Watermill	11976			120 cyd	1.5 tpd paper		
D&T Paper	1590 Lakeland Ave	Bohemia	11716		x		x		150 tpd
DeMatteo Salvage Co.; Inc.	90 Gleam St.	West Babylon	11704			x	x		375 tpd
Emil Norsic & Son; Inc.	42 Sandy Hollow Road	Southampton	11969			55 tpd			
Emjay Environmental Recycling; Ltd.	80 Emjay Blvd.	Brentwood	11717	400 tpd		800 tpd			
Excel Recycling	151 Peconic Ave.	Medford	11763			1980 tpd			
Get-Rid of It	442 Tate St.	Holbrook	11741		x	x	x		370 tpd

Table IV: Permitted Transfer Stations, Recyclables Handling and Recovery Facilities, and C&D Processing Facilities on Long Island

Facility Name	Location Address	City/Town	Zip Code	MSW (ALL)	COMMERCIAL MSW ONLY	C&D	Recyclable	Yard Waste	Combined
Great Gardens; LLC	445 Horseblock Road	Yaphank	11980					85,500 tpy	
Island Waste Services; LTD.	971 Waverly Ave	Holtsville	11742	875 tpd		2900 cyd			
Jet Paper Stock Corp.	228 Blydenburgh Road	Central Islip	11722		550 tpd	100 tpd			
Maggio Sanitation	Commerical Blvd.	Medford				500 cyd			
National Waste Disposal Corp	9 Lincoln Ave	Bayshore	11706		60 cyd	120 tpd			
North Fork Sanitation	8475 Cox Lane	Cutchogue	11935			290 cyd			
Omni Recycling of Babylon	114 Alder Street	West Babylon	11704	x		x			1300 tpd
One World Recycling	685 North Queens Ave.	Lindenhurst	11757	x		x			370 tpd
Paragon Recycling & Transfer Corp.	45 Dale Steet	West Babylon	11704		750 cyd	500 cyd			
Riverhead Rubbish (Crown Sanitation)	865 Youngs Ave.	Riverhead	11901	195 tpd		551 tpd			
Sayville MRF	1155 Lincoln Avenue	Holbrook	11741				1200 tpd		
Smithtown Municipal Services Facility	85 Old Northport Rd	Kings Park	11754					1800 tpd	
East Hampton Solid Waste Management Facil	260 Springs Fireplace Road	East Hampton	11937	x		x	x	25,000 cyy	110 tpd
Tri-Town Carting Corp.	135 South Second St.	Bayshore	11706			750 cyd			
USA Recycling	499 Lawrence Rd.	Kings Park	11754	x		x	x		840 tpw
Waste Management of New York - Yaphank	82A Old Dock Road	Yaphank	11780	485 tpd		500 tpd or 1000 cyd			
Waste Management of New York - Quogue	Old Country Rd. & Midhampton Av	Quogue	11959			299 cyd			
Waste Sorting	2065 Pond Rd.	Ronkonkoma	11779		x	x			120 tpd
Winters Brothers Transfer Station	99 Nancy Street	West Babylon	11704	240 tpd		825 tpd			
Winters Waste Service of New York; Inc.	19 Nancy Street	West Babylon	11702	600 tpd					

NOTES:

1. An "x" delineates that the type of waste is accepted as part of a combined throughput number.
2. Excel is currently limited to 335 tpd due to a consent order.
3. Maggio currently authorized by consent order.
4. MSW throughput to be removed from Winter Brothers Transfer Station permit.
5. Waste Management facilities and Island Waste are pending transfer to Winters Brothers.
6. Services areas are generally Nassau and Suffolk Counties

UNITS:

tpd = tons per day
tpw = tons per week
tpm = tons per month
tpy = tons per year
cyd = cubic yard per day
cyy = cubic yard per year

Table V: Registered Recyclables Handling and Recovery Facilities on Long Island

Facility Name	Location Address	City	Zip Code	Waste Types	Capacity	Service Area				
						Nassau	Suffolk	NYC	Other	Unknown
Nassau County										
Incorporated Village of Lynbrook	DPW Crab Ave.	Lynbrook	11563	Source Separated Recyclables (Metal/Glass/Paper/Plastic)	63 cyd				x	
Old Westbury Transfer Station	1 Store Hill Road	Old Westbury	11568	Source Separated Recyclables (Metal/Glass/Paper/Plastic)	10,000 cyy				x	
S & M Prompt Rubbish	99 East Jamaica Ave	Valley Stream	11580	Source Separated Recyclables (Metal/Glass/Paper/Plastic)	N/A	x				
Valley Stream Transfer Station	200 Arlington Avenue	Valley Stream	11580	Source Separated Recyclables (Metal/Glass/Paper/Plastic)	115 tpd				x	
Village of Floral Park - Mayflower Place	Mayflower Place	Floral Park	11001	Source Separated Recyclables (Metal/Glass/Paper/Plastic)	2000 cyy				x	
Suffolk County										
All Waste Services of America; Inc.	135 Pineaire Drive	Bayshore	11706	Paper (All Types);Paper (Cardboard);Paper (Newsprint)	100 tpd	x	x			
Babylon Paper Stock	92 Mahan St	West Babylon	11704	Paper (All Types)	300 ??					x
Bead Brite Glass Products Corp.	400 Oser Ave, Suite 600	Hauppauge	11788	Glass	13 ??					x
Brookhaven Waste Management Facility	350 Horseblock Road	Brookhaven	11719	Source Separated Recyclables (Metal/Glass/Paper/Plastic)	460 tpd	x	x			
Ed's Salvage Inc.	2140 Fifth Ave.	Ronkonkoma	11779	Paper (All Types);Paper (Cardboard)	n/a	x	x			
Fishers Island MRF	Whistler Ave	Fishers Island	6390	Source Separated Recyclables (Metal/Glass/Paper/Plastic)					x	
Funnel Equity Waldbaums	Lowell Avenue	Central islip	11722	Paper (Cardboard)	100 tpd					x
Huntington Recycling Center	641 New York Ave.	Huntington	11743	Source Separated Recyclables (Metal/Glass/Paper/Plastic)	n/a				x	
Olympic Fibres Corp.	513 Mill Road	Coram	11727	Source Separated Recyclables (Metal/Glass/Paper/Plastic)	50 tpd		x			
Smithtown Municipal Services Facility	85 Old Northport Rd	Kings Park	11754	Metals (Aluminum);Metals (Ferrous);Metals (Non-Ferrous);Plastics;Source Separated Recyclables (Metal/Glass/Paper/Plastic);White Goods;Waste Oil (Automotive);Paper (Newsprint);Paper (All Types)	13,640 tpy				x	
Winters Brothers Recycling Corp.	107 Mahan Street	West Babylon	11704	Paper (Cardboard);Paper (All Types)	50 tpd	x	x			

Notes:

1. Throughput units: cyd - cubic yard per day, cyy - cubic yard per year, tpd - tons per day, tpy - tons per year
2. The notation of the "Other" column for Service Area indicates that the waste accepted is from the respective town or village only.

Table VI: Registered C&D Processing Facilities in Nassau County

Facility Name	Location Address	City	Zip Code	Waste Types	Capacity	Service Area				
						Nassau	Suffolk	NYC	Other	Unknown
ADA Construction Corp.	180 Roger Avenue	Inwood	11096	Brick;Asphalt;Concrete;Soil (Clean);Rock	500 cyd					x
Blue Water Environmental	7 Washington Avenue	Island Park	11558	Asphalt;Brick;Concrete;Non-petroleum Contaminated Soil	1000 cyd					
Bruce DiGiovanni Gen Contr. Inc.	4186 Industrial Place	Island Park	11096	Concrete;Brick;Rock	30 cyd	Hemp., Long Beach				
Con-Strux L.L.P.	702 Grand Boulevard	Westbury	11590	Concrete;Asphalt;Brick;Soil (Clean);Rock	N/A					
Conroc Recycling	55 New Street	Oceanside	11572	Rock;Soil (Clean);Concrete;Asphalt	N/A					
D. Daniels Contracting; Ltd	40 Gates Avenue	Inwood	11096	Concrete;Asphalt;Brick;Soil (Clean)	300 cyd	x				
Dejana Industries; Inc;	138 Shore Road	Port Washington	11050	Street Sweepings;Commingled Recyclables	N/A					
Eberhard-Voelm Nurseries	500 Franklin Ave	Frankin Square	11010	Wood (Chips)	50 cyd					
Empire Sand & Stone Corp.	505 Grand Boulevard	Westbury	11590	Concrete;Asphalt;Brick;Soil (Clean);Rock	83,000 cyy					
Frank Robustello & Son; Inc.	380 North Long Beach Rd.	Rockville Centre	11570	Brick;Asphalt;Concrete;Non-petroleum Contaminated Soil	100 cyd					
JP Equipment Contracting	3572 Hampton road	Oceanside	11572	Soil (Clean);Wood (Trees/Stumps);Rock;Concrete	1000 cyd	x		x		
Nassau Ready Mix Corp.	47 Herb Hill road	Glen Cove	11542	Concrete	2000 cyy	X		X		
New York Demo, LLc	43 Debevoise Avenue	Roosevelt	11575	Brick;Asphalt;Concrete;cardboard;metals;rock;soil;wood	500 cyd	x	x	x		
Old Bethpage Trans. Sta.; Wood Waste Proc. Fac.; & Landfill	101 Bethpage-Sweet Hollow Rd.	Old Bethpage	11714	Wood (Contaminated)	N/A	Town of Oyst. Bay				
Rason Ashpalt; Inc - North Lawrence	4 Johnson Road	North Lawrence	11559	Brick;Asphalt;Concrete	500 cyd					x
Rason Asphalt Inc. - Glen Cove	44 Morris Ave	Glen Cove	11542	Asphalt;Concrete;Brick	500 cyd					x
Rizzo Associates	97 East Hawthorne Avenue	Valley Stream	11580	Soil (Clean);Rock;Concrete;Asphalt;Brick;Wood (Clean)	1000 cyd	x	x			
S & M Prompt Rubbish	99 East Jamaica Ave	Valley Stream	11580	Wood (Clean)	200 cyd	x				
South Island Industries Inc	Rason Rd	Inwood	11096	Asphalt;Brick;Concrete;Soil (Clean);Rock	70,000 cyy	x	x	x		
Twin County Recycling Corp	449 W John St	Hicksville		Concrete;Asphalt;Brick;Soil (Clean);Rock	700,000 cyy					x

Notes:

1. Throughput units: cyd - cubic yard per day, cyy - cubic yard per year, tpd - tons per day, tpy - tons per year
2. Please note

Table VII: Registered C&D Processing Facilities in Suffolk County

Facility Name	Location Address	City	Zip Code	Waste Types	Capacity	Service Area				
						Nassau	Suffolk	NYC	Other	Unknown
All County Demo	416 Miller Place-Yaphank Roa	Miller Place	11764	Wood (Trees/Stumps);Concrete	35,000 cyy		x			
Artco Drainage	North Fork industrial Park; Lot#	Cutchogue	11935	Asphalt;Brick;Concrete;Soil (Clean)	200 cyy				E. End	
Babylon DPW Site - Coplague	Marconi Blvd	Coplague	11726	Concrete;Asphalt;Soil (Clean)	n/a				Town	
Babylon DPW Site - Lindenhurst	Long island Ave	Lindenhurst	11757	Concrete;Asphalt	n/a				Town	
Barker Material & Mason Supply LTD	114 Rocky Point Rd.	Middle Island	11953	Asphalt;Brick;Concrete;Soil (Clean);Rock;Wood (Clean)	n/a					x
Bedrock Industries Corp	Railroad Track Road & West B	Greenlawn	11740	Brick;Asphalt;Concrete;Soil (Clean);Rock	75 cyd		x			
Belli Contracting Company Inc.	885 Crooked Hill Road	W. Brentwood	11717	Asphalt;Concrete;Soil (Clean);Wood (Trees/Stumps)	30,000 cyy	x	x			
Bistrian Gravel Corp.	225 Spring Fireplace Rd.	East Hampton	11937	Asphalt;Brick;Concrete;Soil (Clean);Rock	n/a					
Bistrian Materials; Inc.	89 Industrial Road	Montauk	11954	Soil (Clean);Concrete;Asphalt;Brick;Wood (Trees/Stumps)	290,500 cyy		x			
Bistrian Materials; Inc.	175 Springs-Fireplace Road	East Hampton	11937	Soil (Clean);Asphalt;Brick;Concrete;Wood (Trees/Stumps)	160,500 cyy		x			
Bridgehampton Materials & Heavy Equipment Co.	Millstone Road	Bridgehampton	11932	Wood (Clean);Concrete;Asphalt	10,000 cyy					x
Brinic Corp.	890 South Second Street	Ronkonkoma	11779	Brick;Concrete;Asphalt;Rock;Soil (Clean)	10,000 cyy					
Brookhaven Waste Management Facility	350 Horseblock Road	Brookhaven	11719	Concrete	n/a				Town	
C.B. Recycling	301 Edison Ave	Babylon	11702	Asphalt;Brick;Concrete;Rock;Soil (Clean)	n/a					x
Calverton Industries	4331 Route 25	Calverton	11933	Asphalt;Brick;Concrete;Gravel;Rock;Soil (Clean)	5000 cyd	x	x	x		
Casa Industries LLC	Gleam St	West Babylon	11704	Concrete;Asphalt	1200 tpd					x
Chesterfield Associates	56 South Country Rd.	West Hampton	11977	Concrete;Asphalt	n/a	x	x			
Chip It All	366 Sheep Pasture Rd.	Port Jefferson Static	11766	Wood (Clean)	50,000 cyy	x	x			
Corazzini Asphalt Inc.	Cox Lane	Cutchogue	11935	Asphalt;Brick;Concrete	3000 ???		x			
Custom Earth Recycling L.L.C.	45 South Fourth Street	Bayshore	11706	Wood (Trees/Stumps);Concrete;Asphalt;Brick	120,000 cyy		x			
D'Agostino Brothers Enterprises; Inc.	133 Old Northport Road	Kings Park	11754	Asphalt;Concrete;Brick;Rock	n/a	x				
DeChiaro Associates Corp. (Lot 2 & 2A)	Lots 2; 2A Grucci Lane	Yaphank	11980	Asphalt;Brick;Concrete;Rock;Soil (Clean)	600,000 cy	x	x	x		
DeChiaro Associates Corp. (Lot 4 and 4a)	Lot 4; 4A Grucci Lane	Yaphank	11980	Asphalt;Brick;Concrete;Rock;Soil (Clean)	600,000 cy	x	x	x		
East Coast Mines	Lewis Road	East Quogue	11942	Concrete;Wood (Clean)	10,000 cyy					x
East Patchogue Contracting Corp.	Barthold Ave.	East Patchogue	11772	Asphalt;Brick;Concrete;Soil (Clean);Rock	17,000 cyy	x	x			
Ed Barsic Jr.	170 Field Street	West Babylon	11704	Gravel;Soil (Clean);Sand;Wood (Trees/Stumps)	24,000 cyy		x			

Table VII: Registered C&D Processing Facilities in Suffolk County

Facility Name	Location Address	City	Zip Code	Waste Types	Capacity	Service Area				
						Nassau	Suffolk	NYC	Other	Unknown
Emil Norsic & Son; Inc.	42 Sandy Hollow Road	Southampton	11969	Wood (Clean);Wood (Trees/Stumps);Concrete;Asphalt;Brick;Soil (Clean);Rock	62,000 cyy				E. End	
Global Land Materials	20 Arthur Ave.	Bellport	11719	Wood (Clean);Concrete;Asphalt;Brick;Soil (Clean)	2000 cyd	x	x	x	Westchester Rockland	
Great Gardens; LLC	445 Horseblock Road	Yaphank	11980	Wood (Clean)	3000 cyd					x
Grimes Contracting Co.; Inc.	Georgia Drive	Wainscott	11975	Concrete;Asphalt;Brick;Rock;Sand			x			
Hampton Sand Mining Corp.	High Street	Speonk	11972	Wood (Clean);Asphalt;Brick;Concrete;Rock;Soil (Clean)	660 cyd				Brkhvn, Southamton	
Holbrook Truck & Leasing Corp	54 Union Ave	Ronkonkoma	11779	Concrete;Soil (Clean);Asphalt;Brick;Rock	200 cyd		x			
Huntington Ready Mixed Concrete; Inc.	1299 SPEONK-RIVERHEAD R	Speonk	11972	Concrete;Asphalt;Brick	70,000 cyy	x	x			
Islandwide Recycling	91-99 Kean St	Babylon	11702	Concrete;Asphalt;Rock	n/a					x
Izzo Brothers	294-B Old Northport Road	Kings Park	11754	Soil (Clean);Rock;Concrete;Brick;Asphalt	2000 cyd	x	x	x		
Kenneth P. Edwards Inc.	1580 Fifth Ave.	Bayshore	11706	Concrete;Asphalt;Brick	n/a		x			
Kings Park Asphalt Corp.	Townline Road	Kings Park	11754	Rock;Soil (Clean);Asphalt	500 cyd		x			
Lakeland Landscape & Masonary Supply	1990 Lakeland Avenue	Ronkonkoma	11779	Wood (Trees/Stumps)	n/a		x			
Lakeland Landscaping Supply Corp.	2185 Pond Road	Ronkonkoma	11779	Soil (Clean);Gravel;Wood (Clean)	1000 cyd		x			
Liere Farm - N. Service Rd.	North Service Road	Yaphank	11980	Wood (Trees/Stumps)	n/a					x
LLL Industries; Inc.	Frowein Road and Railroad Av	Moriches	11955	Asphalt;Brick;Concrete;Rock;Soil (Clean)	7800 cyy		x			
Long Island Dirt Corp.	Rajon Road	Bayport	11705	Concrete;Asphalt	5000 ???	x	x			
Monte' Calvo Asphalt	Speonk- Riverhead Road	Speonk	11972	Concrete;Asphalt	300 cyd		x			
Northeast Recycling Corp.	1612 Fifth Avenue	Bayshore	11706	Asphalt;Brick;Concrete;Rock;Wood (Trees/Stumps);Soil (Clean)	1000 cyd	x	x			
Paul R. Guillo Construction Corp.	Magee St.	Southampton	11969	Soil (Clean);Asphalt;Brick;Rock;Concrete;Wood (Clean)	25,000 cyy					x
Pure Recycled Products Inc.	613 Furrows Road	Holtsville	11742		445,000 tpy					x
R. Schleider Contracting (Site B)	135 Old Northport Rd.	Kings Park	11754	Asphalt;Brick;Concrete;Rock;Soil (Clean)	520 cyd	x	x			
R. Schleider Contracting Corp. (Site A)	Old Northport Road	Kings Park	11754	Asphalt;Brick;Concrete;Rock;Soil (Clean)	375 cyd	x	x			
Ralph Ave Highway Yard	Ralph Avenue	Babylon	11702	Soil (Clean);Asphalt;Concrete	40,000 cyy				Town	
Rason Asphalt Inc. - Melville	136 Spagnoli Road	Melville	11747	Asphalt;Concrete;Brick;Sand;Rock	25,000 cyy					x
Recycled Earth Products	140 Old Northport Road	Kings Park	11754	Wood (Trees/Stumps);Concrete;Rock;Brick;Soil (Clean)	n/a					x
Riley Excavating & Contracting; Inc.	195 S. Denver Ave	Bay Shore	11706	Concrete;Asphalt;Brick;Soil (Clean);Rock	n/a					x

Table VII: Registered C&D Processing Facilities in Suffolk County

Facility Name	Location Address	City	Zip Code	Waste Types	Capacity	Service Area				
						Nassau	Suffolk	NYC	Other	Unknown
Roanoke Sand & Gravel Corp.	104 Rocky Point Road	Middle Island	11953	Concrete;Asphalt;Brick;Soil (Clean);Rock	10,000 cyy					x
Shelter Island Wood & Compost	Bodwitch Road	Shelter Island	11964	Wood (Trees/Stumps)	1000 cyd				Town	
Shelter Island Sand; Gravel & Const. Inc.	17 Bodwitch Road	Shelter Island	11964	Concrete;Brick;Asphalt;Street Sweepings;Rock					Shelt. Isl.	
Skyline LLC	56 Comsewogue Road	East Setauket	11733	Asphalt;Brick;Concrete;Rock;Soil (Clean)	n/a					x
South Shore Materials Inc.	South 4th Street	Bayshore	11706	Concrete;Asphalt	500,000 cyy	x	x			
Steven M. Mezynieski; Inc.	110 North Magee Street	Southampton	11969	Wood (Trees/Stumps);Concrete;Asphalt	24,000 cyy		x			
Suffolk Asphalt Supply Inc. - Hauppauge	242 Rabro Drive	Hauppauge	11788	Asphalt;Concrete;Brick;Soil (Clean);Rock						x
Suffolk Asphalt Supply; Inc - West Hampton B	100 Rogers Avenue	West Hampton Beac	11978	Asphalt;Concrete;Brick;Soil (Clean)						x
TS Haulers	Route 25	Calverton	11933	Asphalt;Brick;Concrete;Rock;Soil (Clean)	600 cyd	x	x	x		
Watbro Recycling; Inc.	45 South Fourth Street	Bayshore	11706	Asphalt;Brick;Concrete;Rock;Soil (Clean)	500 cyd	x	x	x		
Westhampton Mining & Aggregates	Old Country Road	Westhampton	11977	Concrete	5,000 cyd				E. End	

Notes:

1. Throughput units: cyd - cubic yard per day, cyy - cubic yard per year, tpd - tons per day, tpy - tons per year

Table VIII: Compost Facilities on Long Island

Facility Name	Location Address	City	Zip Code	Activity Number	Waste Types	Capacity	Service Area				
							Nassau	Suffolk	NYC	Other	Unknown
Permitted Compost Facilities in Suffolk County											
Bistrian Gravel Corp.	225 Spring Fireplace Road	East Hampton	11937	52Y22	Yard Waste	5000 cya					
Holtsville Ecology Center	Buckley Rd.	Holtsville	11742	52Y07	Yard Waste	n/a		x		Brookhaven	
MacArthur Compost Facility	Railroad Avenue	Ronkonkoma	11779	52Y18	Yard Waste	60,000 wty		x		Islip	
Manorville Leaf Composting Facility	Papermill Rd.	Manorville	11949	52Y21	Yard Waste	x				Brookhaven	
Southold Compost Facility	County Road 48	Cutchogue	11935	52Y09	Yard Waste	42,000 cyy				Southold	
Town of East Hampton Recycling & Disposal Center	260 Springs Fireplace Road	East Hampton	11937	52C27	Yard Waste	25,000 cyy				E. Hampton	
Registered Compost Facilities in Suffolk County											
Briermere Farms	4414 Sound Ave	Riverhead	11901	52Y30R	Yard Waste, Food Waste	10,000 cyy		x			
St. Charles Cemetery	Conklin St. @ New Hwy.	West Babylon	11704	52Y45R	Yard Waste	n/a		x			
Long Island Compost Company (LICC) - Farm No. 2	South Street	Manorville		52Y31R	Yard Waste	10,000 cyy					
LICC - Farm No. 6	Wading River Road (NW)	Manorville		52Y33R	Yard Waste	10,000 cyy					
LICC - Farm No. 7	Wading River Road (NE)	Manorville		52Y34R	Yard Waste	10,000 cyy					
LICC - Farm No. 11	South Street / Weeks Avenue	Manorville		52Y54R	Yard Waste	10,000 cyy					
LICC - Farm No. 17	County Rte 51 and 111	Eastport		52Y40R	Yard Waste	10,000 cyy					
LICC - Farm No. 18	County Rte 51 and 111	Eastport		52Y41R	Yard Waste	10,000 cyy					
LICC - Farm No. 20	County Rte 51 and 111	Eastport		52Y42R	Yard Waste	10,000 cyy					
LICC - Farm No. 23	County Rte 51 and 111	Eastport		52Y47R	Yard Waste	10,000 cyy					
LICC - Farm No. 28	Wading River Road	Riverhead		52Y49R	Yard Waste	10,000 cyy					
LICC - Farm No. 30	Speonk-Riverhead Road	Speonk		52Y50R	Yard Waste	10,000 cyy					
LICC - Farm No. 35A	Old Riverhead-Moriches Road	Speonk		52Y52R	Yard Waste	10,000 cyy					
LICC - Farm No. 36	265 South Street	Manorville		52Y53R	Yard Waste	10,000 cyy					
Permitted Compost Facilities in Nassau County											
Garden City Compost	Cherry Valley Avenue at 1st Str	Garden City	11530		Yard Waste	60 cyd				Garden City	

Notes:

1. Throughput units: cyd - cubic yard per day, cyy - cubic yard per year, tpd - tons per day, tpy - tons per year, wty - wet tons per year, cya - cubic yards per acre

CURRENT CONDITIONS IN SUFFOLK COUNTY

The actual quantification of the volume of solid waste generated within Suffolk County is a difficult and elusive task because of the complexity of waste collection, transfer and disposal options. There are also several levels of municipalities involved and a large, diverse commercial waste management component.

There is the issue of definitions when one seeks data in annual facility reports. Does "solid waste" include yard waste, bulk metals and/or construction/demolition debris? Are regional tonnages counted at each step in a process, such as collection, transfer station output and tonnage into a local disposal facility? A reported tonnage from a town may only include waste brought by self-haulers to a resident drop-off facility while the majority of the residential waste generated is collected, unreported, by private haulers and taken to a transfer station not located within the town.

The best effort to date to gather and report available regional waste management data has been done by Professor David Tonjes of the Department of Technology and Science, College of Engineering and Applied Science, Stony Brook University. With the approval of Dr. Tonjes, the sections of the report relative to Suffolk County are presented herein. These sections provide a current status of municipal and commercial waste management systems in Suffolk County.

A Waste Reduction and Management Institute Report
School of Marine and Atmospheric Sciences
Stony Brook University

Municipal Solid Waste Assessment
Nassau and Suffolk Counties
Long Island, New York
2006

Prepared by:
David J. Tonjes
Department of Technology and Society
College of Engineering and Applied Sciences
Stony Brook University

August 2007

1. Introduction

Solid waste can be difficult to count. This may be hard to believe for some, because garbage is a very tangible thing, and it is difficult to conceive that it is not easy to find, assess, and quantify. Nonetheless, for a variety of reasons, creating accurate counts of solid waste is not simple.

Complicating factors include:

1) A failure to weigh the garbage. When many Long Island municipalities operated local landfills, residents often brought car or truck loads of garbage for disposal, and were either charged a set fee or no fee. There was no reason to weigh these loads, and so many were not. Today, the Town of Southampton rarely weighs incoming yard waste, and so does not quantify that waste stream.

2) Incommensurate measures. Many private transfer stations and some municipal sites often charge or measure wastes by volume. To complicate matters further, they may report outgoing wastes by ton (since upstream sites may measure with scales). It is possible to translate volumes to weights, but not with dependable accuracy.

3) Inclusion (or exclusion) of relevant waste stream components. Regulators often define garbage; they often disagree about the definitions. For instance, the US Environmental Protection Agency (USEPA) does not include construction and demolition debris in its definition of municipal solid waste (MSW). The New York Sate Department of Environmental Conservation (NYSDEC) does (at this time). In practical terms, facility operators deal with a delivered waste stream. The components of that waste stream may or may not be similar to what another facility receives, and may or may not accord with one or more definitions of MSW. The operators of the facility may treat the delivered wastes in such a fashion as to separate it into various components – which then may be included as MSW or not in accountings to regulators, the public, or others. These decisions may be guided by desires to make the facility operation look good in one way or another, to hide financial implications, to try to accord with regulations, or merely to agree with past practices. However, the result of these decisions usually is differing operational definitions regarding the content of MSW for different facilities.

4) Inaccurate reporting. The waste stream or its specific components may be badly counted (arithmetic errors, spreadsheet mistakes, lost information, etc.), or may be obfuscated. The latter may be done so as to avoid reporting permit violations or to hide business dealings or details. Private transfer stations are sometimes thought to be prone to these kinds of omissions.

5) Difficulty in tracking all of the appropriate waste streams. Most of the incorporated villages in western Long Island do not use the larger Town waste management systems. Thus, instead of 15 municipal waste managers, there are probably on the order of 50 residential waste managers across Long Island. Ensuring all of these wastes are properly accounted for is an uncertain task.

6) Double counting. Wastes often move from facility to facility. The Town of Brookhaven used to report all of the incoming waste stream into its recycling facility as Brookhaven recyclables, although it was also receiving collected materials from the Towns of Oyster Bay, Islip, and Southampton, which had also laid credit to the recyclables. Wastes sent from one transfer station to another may also be counted twice.

7) Unreported facilities. NYSDEC now posts many annual reports on-line for public consumption. However, it is clear that not all reports are posted, even for municipal transfer stations and disposal facilities. It seems that some important transfer station reports have not yet been made available. Recycling facility and compost site reports are not posted.

8) Prioritization of resources. Not all local governments wish to or can easily share information regarding their solid waste programs, and the same is true for many private firms.

A myriad of other kinds of problems can arise. At one local municipal facility, for instance, ingoing tonnages of one class of materials do not match outgoing tonnages, as they should. It is thought that this occurs because it is a multiple use facility. That is, materials that enter the facility and are counted as going to one management area actually are directed to another. Because there is no fiscal impact to the choice of where the materials are sent, and it would be very difficult operationally to insure these mistakes do not occur, the operators allow these practices to continue. But this means that hundreds of tons of garbage "disappear" over the course of a year.

The following report is intended to be an accurate accounting of solid waste management in 2006 across Nassau and Suffolk Counties, Long Island, New York. The information was collected from official sources, and nearly all of the municipal data and reports were reviewed by local governments. This, then, is an accurate report insofar as it reports information that was available.

It is intended that this will be the first of a continuing series of assessments of Long Island solid waste. The series will include annual reports on the size and management of Long Island's solid waste, but also will expand to include research on various applied solid waste issues.

Assistance in preparing this report was received from Jim Bunchuck (Southold), Paul DiMaria (Southampton), Mike Dorsky (North Hempstead), Edward Eaton (Long Beach), Michael Engelmann (North Hempstead), Audrey Gallo (Huntington), Jim Heil (Cashin Associates, Hauppauge), Josephine Jahier

(Huntington), John Kowalchyk (Brookhaven), Dominic Longobardi (Hempstead), Tom Melito (Cashin Associates), Christine O'Connell (Waste Reduction and Management Institute, School of Marine and Atmospheric Sciences, Stony Brook University), Syed Rahman (NYSDEC, Region I), Al Sanchez (Islip), Eric Swenson (Oyster Bay), Jamie Van Dyke (Oyster Bay). Their help is gratefully acknowledged. Larry Swanson (Waste Reduction and Management Institute) reviewed a draft of this report and made helpful comments.

Maps for Hempstead, Babylon, Brookhaven, East Hampton, Islip, Riverhead, Shelter Island, Smithtown, Southampton, and Southold were copied (and sometimes modified slightly) from the 2006 LIPA Population Survey. The map for Long Beach is from Google Maps. The Glen Cove map was copied from a City web page. The North Hempstead map was copied from the Town Solid Waste Management Plan. Oyster Bay and Huntington provided the maps used for those Towns.

Municipal Waste Management

Most of this report discusses municipal (Town and City) systems for managing MSW in Nassau and Suffolk Counties. The thirteen Towns and two Cities discussed in this section are designated as "Solid Waste Planning Units" by New York State. This means they have been given authority (and responsibility) by the State to manage local wastes, to one degree or another.

These reports follow a consistent format, and were intentionally written to be complete modules in and of themselves. The focus of this report is on current waste management practices, especially the collection and management of residential wastes. For many units, this is a fait accompli in a sense, as many of the municipalities restrict the scope of their activities to various portions of the residential waste stream.

One technical note: all population data are from the LIPA 2006 Population Survey, which is an ongoing estimate from census data and adjustments to those decennial reports based on electrical service connections and disconnections.

Town of Babylon

Background:
The Town of Babylon has a 2006 population of 217,061. There are two villages in the Town that manage solid waste separately from the Town (Babylon and Lindenhurst). The Town has a separate Solid Waste Management District. This district manages residential and a portion of commercial solid waste for the remainder of the Town. The villages manage their solid waste through the Town program.

Collection:
All residential, commercial, and institutional waste generators receive some amount of waste collection. The Town bids out collection for its residential waste district, and encourages consortiums of local carters to bid. These properties receive two garbage and one recyclables collection each week. Yard waste is collected separately (up to ten items a week). White goods are also collected separately. Commercial and institutional sites (5,000 Town-wide) receive a minimal service level, depending on estimates of their waste generation, at a particular rate, from private carters determined through a similar bid process. Commercial and institutional waste generators can arrange for greater than minimal services either through the Town or by hiring another service provider on their own. The Town, by law, cannot interfere with existing recycling services provided by the private sector carters, but will provide recycling services to new stops in the commercial district.

Curbside recyclables are paper (newspaper, corrugated cardboard, magazines, telephone books, and junk mail, tied or in a paper bag), and containers (glass, #1 and #2 plastics, and metal containers, either placed in a Town-provided container or a clear plastic bag). The Town accepts these items plus car and household batteries, motor oil, oil filters, Styrofoam, rocks, brick and concrete, and up to four tires on a drop-off basis at the Town recycling center. Once a year the Town sponsors a STOP day for hazardous household waste at the Town recycling center.

Waste Management Facilities:
The Town funded the construction of a Waste-to-Energy incinerator. It is operated by Covanta, which will take ownership of the facility in 2009. In 2005, the Town extended its agreement with Covanta through 2035. The Town operates an ashfill at the old Town landfill, where the residues from the plant are disposed. This facility is nearing its design capacity. Innovative measures have been taken over the past decade to extend the capacity of the ashfill. The Town operates a recycling center.

Waste Disposal:
Garbage is disposed at the Covanta WTE plant. At one time, the Town collects more waste from residents and businesses than the plant can accommodate. The Town does not process its own recyclables, but uses other facilities. Yard waste is shipped off-Long Island through Omni Recycling.

Solid Waste Statistics:
The data generated by the Town represents all of the residential wastes generated in the Town, and a substantial proportion of the wastes disposed by commercial and institutional generators. Town statistics do not account for all commercial wastes, especially recyclables.

2006 waste management data:
The Town was unable to provide 2006 data.

Disposal:

Incinerated (tons)	Transported (tons)	Recycled (tons)	Total (tons)	Recycling Percent	Waste generation rate (lbs/person/day)

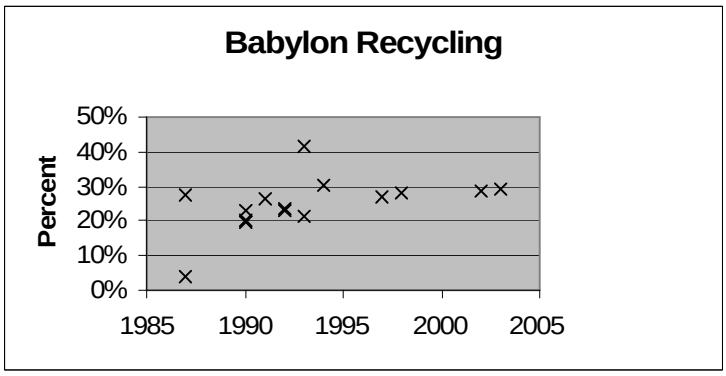
Recycling:

Curbside paper	Curbside containers	Bulk metal	Yard waste	Other recycling

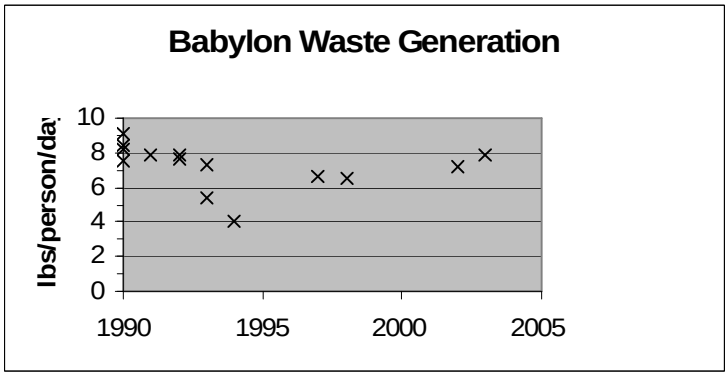
Babylon constructed an innovative facility to process recyclables (source-separated and to separate recoverable material from the waste stream post-collection), but the process was not successful. The facility is now operated by Omni Recycling, and Babylon does not process its recyclables itself.

Waste Management Trends:

Recycling rates:



Waste generation rates:



Historical data:

Year	Recycled	Landfilled	Incinerated	Transported	Total
1980		275,000			275,000
1985		180,000			180,000
		231,518			231,518
		257,982			257,982
		273,200			273,200
1986		219,552			219,552
		225,000			225,000
		243,000			243,000
1987	50,000	132,000			182,000
	6,500	156,500			163,000
1988					264,980
1990	56,040		223,720		279,760
	61,959				
	77,552	41,758	218,929		338,239
					304,458
	61,959	27,231	223,720		312,910
1991	76,459		213,755		290,214
			225,000		
1992	66,827		222,950		289,777
	66,826		202,170	12,100	281,096
1993	112,433				271,423
			245,000		
1994	45,658		105,444		151,102
			218,000		
1995			222,000		
1996			177,000		
1997			181,000		
	66,838				248,222
1998			224,000		
	69,051				247,739
1999			220,000		
2002	79,804		200,794		280,598
2003	89,814		216,259		306,073

1986 (1), 1990 (1,2,3,4), 1991 (1), 1992 (1), 1993 (1), 1994 (1), 2002-2003: Town data
1980: Brown et al.
1985 (1), 1987 (1): Legislative Committee on Water Resources reports
1985 (2,3), 1988: CDM reports
1985 (4): H2M report
1986 (2), 1992 (2): LI Regional Planning Board reports
1986(3), 1991 (2), 1993 (2), 1994 (2), 1995-1996, 1997 (1), 1998 (1), 1999: Legislative Committee on Solid Waste Management reports

1987 (2), 1990 (5): Newsday
1997 (2), 1998 (2): NYSDEC Annual Recycling reports

Babylon, as with other LI municipalities, has a history of presenting its solid waste data in different ways for various audiences. In 1993-1994, the Town experimented with post-collection separation of recyclables (with North Hempstead). The commercial waste district was established in 1994 in response to a US Supreme Court decision eliminating solid waste flow control. Some state data sets may represent facility tonnages, not Town tonnages.

Town of Brookhaven

Background:
The Town of Brookhaven is the largest Town by area on Long Island, and has a 2006 population of 485,295. The Town does not manage solid waste in any of the eight villages in the Town, but manages the residential waste stream in the unincorporated portion of the Town (approximately 93 percent of the Town's population). The Town does not seek to manage commercial or institutional solid waste, but will handle such wastes if delivered to Town facilities. Several villages manage at least a portion of their wastes through the Town program.

Collection:
All single, two-, and three-family residences in the unincorporated parts of the Town receive collection services. The Town is divided into 35 separate districts for the purpose of arranging for contract carters to collect wastes. Residences receive two garbage and one recyclables collection each week. Leaves and brush are collected 32 weeks of the year in a separate pick-up. The Town does not collect grass clippings, although they can be dropped off at Town facilities. White goods and bulk wastes are collected separately by Town crews, by arrangement.

Curbside recyclables are paper (newspaper, corrugated cardboard, magazines, telephone books, and junk mail, tied or in a paper bag), and containers (glass, #1 and #2 plastics, and metal containers, plus aerosol cans and small metal appliances, placed in a Town-provided container). The Town accepts these items plus car and household batteries, motor oil, oil filters, and scrap metal at the Town drop-off centers. The Town's permanent STOP facility for hazardous household waste at the landfill is open two days a week April through October, and Saturdays only the rest of the year

Waste Management Facilities:
The Town has a Waste Management facility in Yaphank, where there is a transfer station, Materials Recycling Facility (MRF), wood chipping and leaf composting operations, residential drop-off facilities, and a landfill, which accepts incinerator ash, C&D, and other non-MSW materials. The Town has two compost sites, a smaller one in Holtsville and a larger site in Manorville, and plans to compost additional materials at the landfill.

Waste Disposal:
The Town ships 200,000 tons a year of garbage to the Hempstead Resource Recovery Facility through an Inter-municipal Agreement, and landfills 230,000 tons of ash in exchange (the Ash-for-Trash deal). If Brookhaven generates more than 200,000 tons, the excess is managed by through a contract with Winters Brothers, leading to disposal either on or off Long Island. The MRF processes paper and container recyclables for market. The Town chips its own wood

waste, and uses its Manorville, Yaphank, and Holtsville sites and LI Compost for leaves.

Solid Waste Statistics:
The data generated by the Town represents nearly 95 percent of the residential wastes generated in the Town, and a very small amount of the wastes disposed by commercial and institutional generators.

2006 Waste Management Data:

Disposal:

Incinerated (tons)	Landfilled (tons)	Transported (tons)	Recycled (tons)	Total (tons)	Recycling Percent	Waste generation rate (lbs/person/day)
205,382	55	20,267	80,589	337,285	31	3.81

The Town does not have its own incinerator, but accesses capacity at Hempstead (200,000 tons/year) through an Inter-municipal Agreement. More than 900,000 tons of materials are landfilled by the Town each year, but these materials (C&D, incinerator ash, car fluff, road sweepings, etc.) are not considered to be MSW.

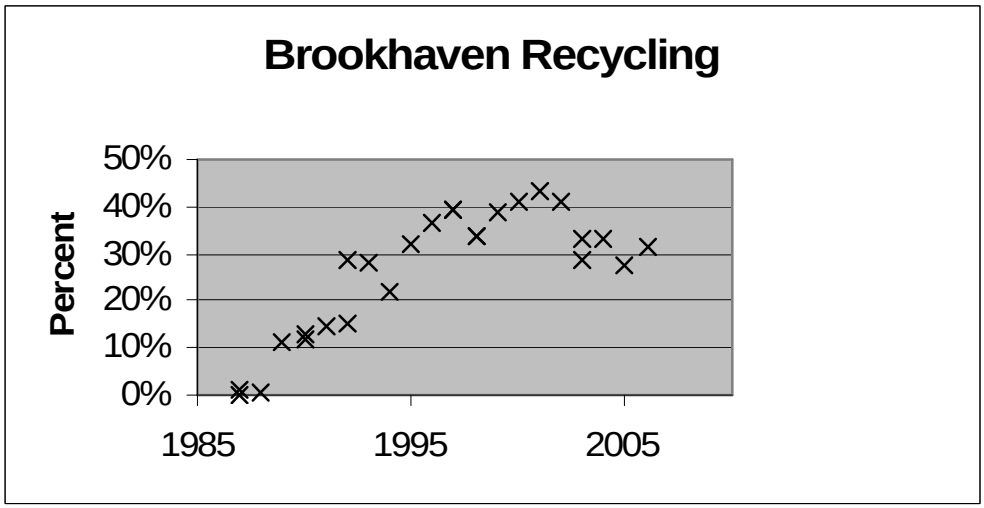
Recycling:

Curbside paper	Curbside containers	Bulk metal	Yard waste	Other recycling
17,425	7,720	1,918	64,338	16,333

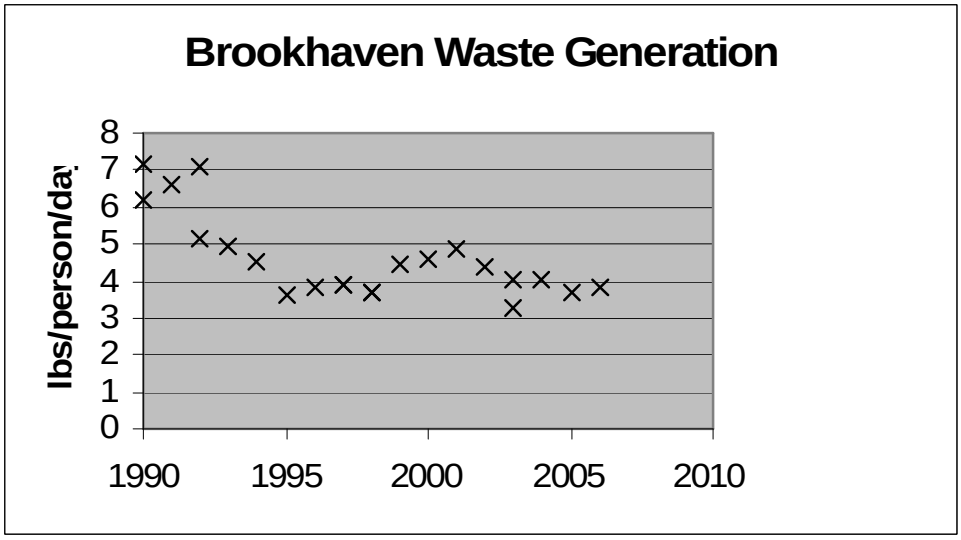
Recycling tonnages have decreased in recent years, due to changes in assigning credits for materials processed at the MRF and decreases in the amounts of materials the Town manages (e.g., the Town used to collect 50,000 tons of wood, primarily from land-clearing for development, through the Highway Department).

Waste management trends:

Recycling rates:



Waste generation rates:



Historical data:

Year	Recycled	Landfilled	Incinerated	Transported	Total
1980		200,000-275,000			200,000-275,000
		425,000			425,000
1981		220,000-290,000			220,000-290,000
1982		230,000-305,000			230,000-305,000
1983					420,000
1985		450,000-500,000			450,000-500,000
					300,000
1986					550,000
		500,000			500,000
1987					515,000
					312,000
					450,000
1988	3,355	476,543			479,898
1989	62,019	489,505			551,524
1990	54,960	405,693			460,653
	68,401	463,664			532,065
1991	72,211	419,963			492,174
1992	110,167	76,907	200,383		387,457
	80,302	251,653	200,883		532,338
1993	104,362	65,560	202,319		371,941
1994	75,500	67,214	201,670		344,384
1995	87,503	24,524	163,246		275,274
1996	107,776	784	184,911		293,471
1997	119,130	3,670	181,462		304,522
	119,151				304,283
1998	97,441		192,020		289,461
	97,504				289,461
1999	135,342	2,808	212,153		350,379
2000	154,052	3,877	215,657		373,586
2001	174,296	5,369	200,751	23,137	403,381
2002	150,949	4,661	208,942	2,695	367,226
2003	114,167	13,171	204,450	13,498	345,285
	80,000		200,000		280,000
2004	115,323	4,122	204,368	19,633	349,775
2005	87,832	432	206,605	20,001	320,529
2006	105,734	55	205,382	20,267	337,285

1983, 1985 (1), 1987 (1), 1988-1989, 1990 (1), 1991, 1992 (1), 1993-1996, 1997 (1), 1998 (1), 1999-2002, 2003 (1), 2004-2006: Town data
1980 (1), 1981-1982: Multi-Town
1980 (2): Brown et al.
1985 (2), 1987 (2): Legislative Committee on Water Resources reports
1986 (1), 1992 (2): LI Regional Planning Board reports
1986 (2): Legislative Committee on Solid Waste Management reports

1987 (3), 1990 (2): Newsday
1997 (2), 1998 (2): NYSDEC Annual Recycling reports
2003 (2): WRMI

Brookhaven managed all of the wastes generated in the Town through approximately 1991. Increases in tipping fees at Town facilities and the

development of off-Long Island transportation infrastructures reduced commercial wastes managed by the Town to near zero by 1994-1995, and the Town failed to meet its 200,00 ton/year commitment to Hempstead 1996-1998. Institution of a zero-tip fee to entice contracted carters to deliver all collected garbage and Town population growth have increased disposal tonnages in the 2000s.

Town of East Hampton

Background:
The Town of East Hampton has a 2006 resident population of 21,399. Although several private carters operate in the Town, it is assumed that all solid waste generated by residents, businesses, and institutions are managed through the Town facilities. There are very large increases in summer populations, due to day trippers but also to second-home use, which means waste management must be sized to meet peak demands far above winter generation rates.

Collection:
The Town does not provide any collection services. Waste generators either contract with private carters or bring their own wastes to one of the two Town transfer stations. Part of the small-town ambience of East Hampton is the trip to the landfill for waste disposal, although as the Town grows in population and affluence this tradition is fading somewhat. Residents gain access to the landfill by providing proof of residency, and purchasing a landfill permit. Carters are licensed by the Town, and pay a per-ton tipping fee.

The Town requires residents to separate recyclable materials from wastes at the site. Recyclables are defined as newspaper, corrugated cardboard, mixed paper (glossy paper, magazines, catalogs, telephone books, and junk mail), glass bottles sorted by color (clear, brown and blue, and green), #1 and #2 plastic containers, aluminum and tin cans, clothing, batteries (car and household), leaves and lawn grass, bulk metal (by arrangement), and for a fee, brush, appliances, and tires. The Town also hosts a Home Exchange Area, where residents may bring and swap items they believe others may wish to have.

The Town conducts two STOP days for hazardous household wastes at each transfer station.

Waste Management Facilities:
The Town has a transfer stations at each of its closed landfills (East Hampton Springs-Fireplace Road, and Montauk). There is a solid waste composting facility at East Hampton, but its use is restricted to yard waste until the Town reduces its back log of compostable yard wastes at the site.

Waste Disposal:

The Town ships its garbage off-Long Island. Recyclables are marketed to various Long Island brokers. Compost is given away to residents. Small amounts are sold to local landscapers and soil manufacturers, or used for municipal projects. The same is true for wood chips.

Solid Waste Statistics:
The disposal tonnages reported by the Town are thought to represent all wastes disposed by Town waste generators. Recycling statistics may be inflated by land-clearing debris and storm debris in some years. Waste generation, considered on a per capita basis, is biased high by the large influx of summer visitors.

2006 waste management data:
The Town was unable to provide 2006 data.

Disposal:

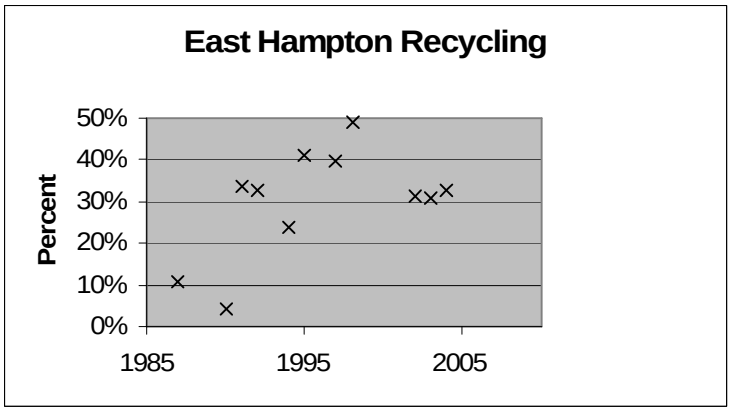
Transported (tons)	Recycled (tons)	Total (tons)	Recycling Percent	Waste generation rate (lbs/person/day)

Recycling:

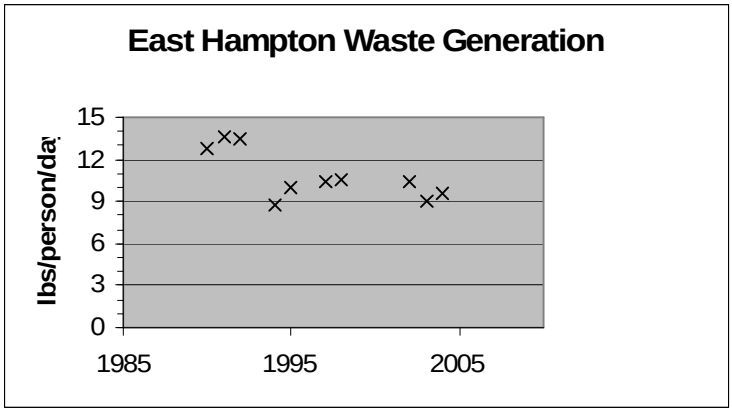
Paper	Containers	Bulk metal	Yard waste	Other recycling

Waste Management Trends:

Recycling rates:



Waste generation rates:



Historical data:

Year	Recycled	Landfilled	Transported	Total
1985				19,000
1986				21,200
		25,200		25,200
1987				18,720
	2,000	17,000		19,000
1989	7,319			
1990	5,806			
	1,672	35,513		37,815
1991	13,430	26,189		40,034
1992	5,922			
	13,000	27,000		40,000
1993	6,226			
1994	6,178		19,844	26,022
1995	12,277		17,243	29,770
1997	12,521			31,691
1998	15,968			32,468
2002	12,151		26,609	38,760
2003	10,508		23,405	33,913
2004	12,034		24,862	36,896

1989, 1990 (1), 1991, 1992 (1), 1993-1995, 2002-2004: Town data
1985, 1987 (1): Legislative Committee on Water Resources reports
1986 (1), 1992 (2): LI Regional Planning Board reports
1986 (2): Legislative Committee on Solid Waste Management reports

1987 (3), 1990 (2): Newsday
1997-1998: NYSDEC Annual Recycling reports

East Hampton landfilled its wastes until 1993 (fighting implementation of the Long Island Landfill Law), and when required to close the landfill on October 9, 1993, began shipping its wastes off-Long Island. The Town also constructed a solid waste composting facility to manage the organic portion of its waste stream. The facility opened in 1991 and was closed to solid waste in 1995 due to high operating costs and difficulties in producing a marketable end product on a consistent basis. Some source-separated food wastes were put through the facility from time-to-time through approximately 2001, when NYSDEC restricted its use to yard waste.

Town of Huntington

Background:
The Town of Huntington has a 2006 population of 202,767. Four Incorporated Villages within the Town do not participate in the Town waste management program, but report statistics to the Town. The Town provides curbside residential waste collection service to the residential properties in the unincorporated portions of the Town, and to commercial establishments in Huntington hamlet.

Collection:
The Town provides collection services to all one, two and three family residences in the unincorporated areas of the Town. Two garbage and one recyclables pickup are provided each week, along with approximately 48 yard waste collections during the year. The Town has divided itself into 18 separate districts. All but two of these districts are let out for bids from private companies. The Town provides collection services with municipal workers in two districts. The Town also collects white goods by separate collection. The Huntington Commercial Refuse District receives daily solid waste and paper recyclables service Monday through Saturday.

Recyclables collections are for paper (newspaper, corrugated cardboard, junk mail, boxboard, school and scrap paper, telephone books) and containers (metal, all plastics, and glass containers, aluminum pans and foil, and household batteries in Town-provided bags). Leaves and brush are collected for composting, but grass clippings are not managed at all, except by drop-off at the Town Recycling Center ($1.50 fee per bag). The Recycling Center accepts all curbside recyclables, scrap metal, electronic wastes, used oil and oil filters, car batteries, textiles, and propane tanks.

The Town's permanent STOP facility for hazardous household wastes is open every Saturday.

Waste Management Facilities:
The Town has a Waste-to-Energy Facility that it financed jointly with the Town of Smithtown. Covanta Energy will assume ownership of the plant in 2011. The Town also has a recycling center that includes a permanent STOP facility.

Waste Disposal:
Garbage collected by the Town is disposed at the incinerator. Commingled recyclables are brought to Omni Recycling of Babylon, and paper is brought to Westbury Paper. Yard waste is sent to Omni Recycling of Babylon.

Solid Waste Statistics:
The disposal tonnages reported by the Town reflect most of the residential waste generation within the Town and a good portion of the commercial waste generated in the Town. The exact proportion of the commercial waste that is managed has not been quantified.

2006 waste management data:
Disposal:

Incinerated (tons)	Recycled (tons)	Total (tons)	Recycling Percent	Waste generation rate (lbs/person/day)
140,020	69,809	209,829	33.3%	5.67

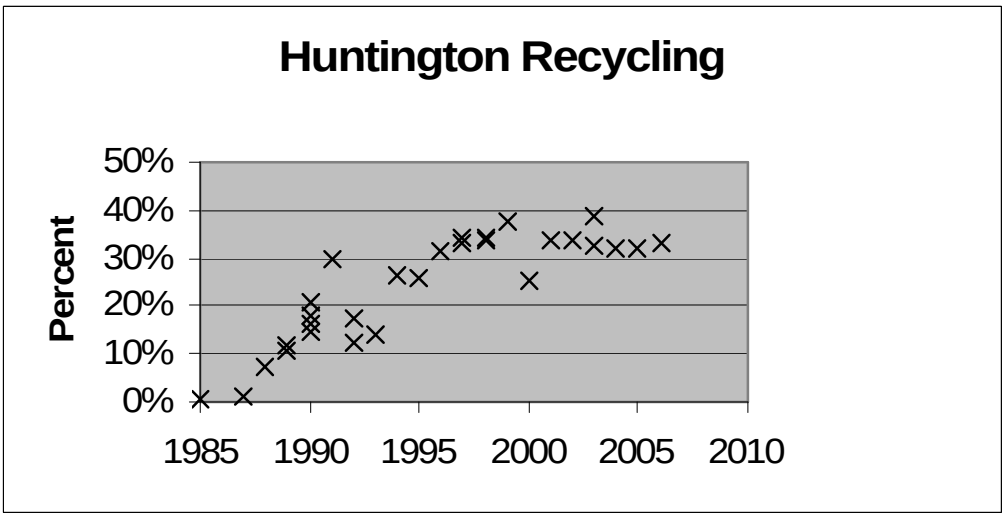
Recycling:

Curbside Paper	Curbside Containers	Bulk metal	Yard waste	Other recycling
12,326	4,563	4,760	24,802	23,358

Recycling statistics include some commercially-generated material.

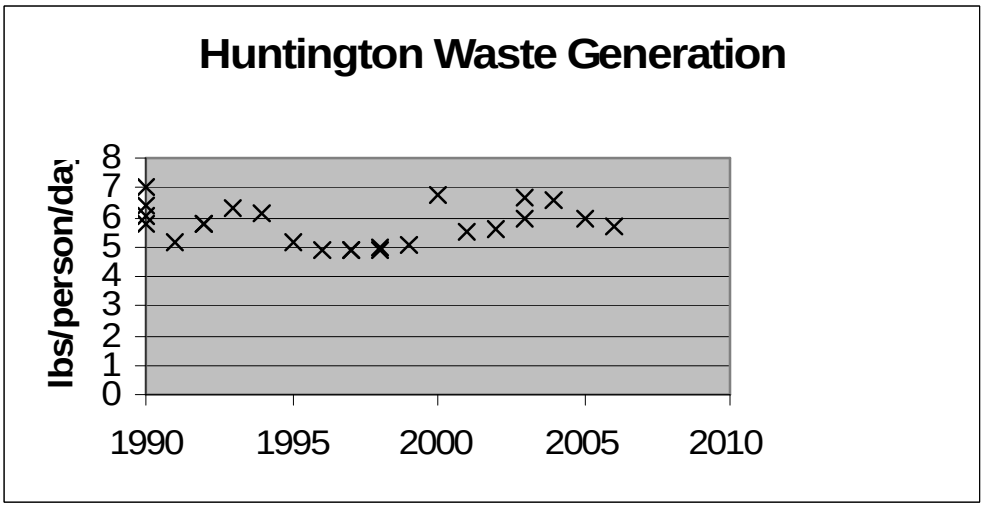
Waste Management Trends:

Recycling rates:



Recycling rates have been stable for over a decade.

Waste generation rates:



Town data include some C&D tonnages managed through the Town of Smithtown.

Historical data:

Year	Recycled	Landfilled	Incinerated	Transported	Total
1979	1,177				
1980	1,004				
1981	1,075				
1982	1,177	199,321			200,498
1983	930	205,535			206,465
1984	678	237,916			238,594
1985	807	253,570			254,377
					230,000
1986		250,000	100,000		350,000
					302,400
		206,210	74,337		280,547
1987					234,000
	2,000	200,000	40,000		200,000
1988	16,652	213,382			230,034
1989	31,301				265,222
	27,296	233,972			261,958
1990	32,723	191,846			224,569
	32,723	167,900			200,623
	44,228	167,900			212,128
	44,228	201,373			245,601
1991	53,306	103,087	23,720		180,113
			50,978		
1992	35,338	32,745	133,740		201,483
	25,000	41,000	133,824		199,824
1993	30,680	43,829	143,162		217,671
			274,000		
1994	56,001	4,325	151,914		212,240
			291,000		
1995	46,316	6,481	126,734		179,532
			282,000		
1996	53,077	3,961	111,959		168,998
			304,000		
1997	56,289	3,756	109,427		169,472
			307,000		
	58,405				169,471
1998	57,650	1,813	112,064		171,527
			309,000		
	59,835				173,639
1999	67,773	1,575	110,841		180,189
			315,000		
2000	61,314	1,563	178,463		241,340
2001	66,273	1,349	129,055		196,677
2002	67,887	1,118	131,898		200,903
2003	77,704	1,378	160,279	1,378	239,361
	83,315		132,000		215,315
2004	76,112		162,256	1,417	239,785
2005	70,514		147,781	1,007	219,302
2006	69,809		140,020		209,829

1979-1984, 1985 (1), 1986 (1), 1988-1989, 1990 (1,2,3), 1991 (1), 1992 (1), 1993 (1), 1994 (1), 1995 (1), 1996 (1), 1997 (1), 1998 (1), 1999 (1), 2000-2002, 2003 (1), 2004-2006: Town data
1985 (2), 1987 (1): Legislative Committee on Water Resources reports
1986 (2), 1992 (2): LI Regional Planning Board reports
1986 (3), 1991 (2), 1993 (2), 1994 (2), 1995 (2), 1996 (2), 1997 (2), 1998 (2), 1999 (2): Legislative Committee on Solid Waste Management reports

1987 (2), 1990 (4): Newsday
1997 (3), 1998 (3): NYSDEC Annual Recycling reports
2003 (2): WRMI

Huntington operated a landfill until 1989, and for some of those years incinerated some wastes to reduce the volume of material. In 1989, Huntington began shipping some MSW and other wastes to the Smithtown landfill, so that the landfilling tonnage after 1991 reflects material sent to Smithtown. The incinerator began operating in 1991. The Smithtown landfill closed in 2003, and unprocessible wastes have been managed by the Town of Smithtown through its transfer station. Huntington used to conduct its own composting, but closed the municipal site in the early 1990s.

Town of Islip

Background:
The Town of Islip has a 2006 population of 332,484. The Town has established waste districts that cover the entire Town. The non-Fire Island incorporated villages (Islandia and Brightwaters) participate in the Town program. Islip likes to claim to be the first Town on Long Island with a comprehensive curbside recycling collection program.

Collection:
The Town provides collection services to all one and two family residences in the Town. Two garbage and one recyclables pickup are provided each week, with separate collections of yard waste (no grass clippings are accepted, however). The Town has divided itself into 70 separate districts for waste collection, let out to bid for private companies to provide collection services. The Town uses municipal workers in seven districts and collects white goods.

Recyclables collections are for paper (newspaper, corrugated cardboard, junk mail and other printed paper) and containers (metal, plastic #1 and #2, and glass containers). Leaves and brush are collected for composting, but grass clippings are not managed at all, except by drop-off at the Compost Site. Waste oil and batteries are accepted at the Multipurpose Recycling Center.

The Town has established “Black Pail” districts. The Town issued special pails designed to work with automated collection trucks in the seven municipal districts. Residents only put “kitchen” wastes (food and similar wastes, and non-recyclable packaging) in these containers. Black pails are collected twice a week. Other trash is collected on the second pick-up day. Recyclables and yard waste are managed as in the other districts.

The Town conducts two STOP days for hazardous household wastes each year.

Waste Management Facilities:
The Town has a Waste-to-Energy Facility that it financed through the waste management authority. Islip will retain ownership when the bonds mature in 2009. Islip also constructed a Multipurpose Recycling Center. It has a large

composting site. The Town operates a landfill that can accept C&D and similar materials, but not incinerator ash.

Waste Disposal:
Garbage collected by the Town is brought to the incinerator. Approximately 175,000 tons a year are managed at the incinerator. Any excess tonnage is transported by Winter Brothers out-of-state. The Town processes its curbside recyclables to market specifications, and generates marketable compost.

Solid Waste Statistics:
The disposal tonnages reported by the Town reflect all residential waste generation within the Town (the Town established a "zero-tip fee" program to ensure district carters brought all wastes to the Town for disposal in the mid-1990s). At that time, agreements were made with private carters to have some commercial wastes processed through the Town, ensuring there would be adequate feedstock for the incinerator and to allow for reasonable out-of-Town disposal options. Town data therefore includes at least a portion of the commercial waste stream.

2006 waste management data:

Disposal:

Incinerated (tons)	Transported (tons)	Recycled (tons)	Total (tons)	Recycling Percent	Waste generation rate (lbs/person/day)
161,413	46,395	138,645	332,884	40.0	5.71

The landfill accepts approximately 68,000 tons of C&D and other similar material each year from in-Town sources. This material is not classified as municipal solid waste by many authorities.

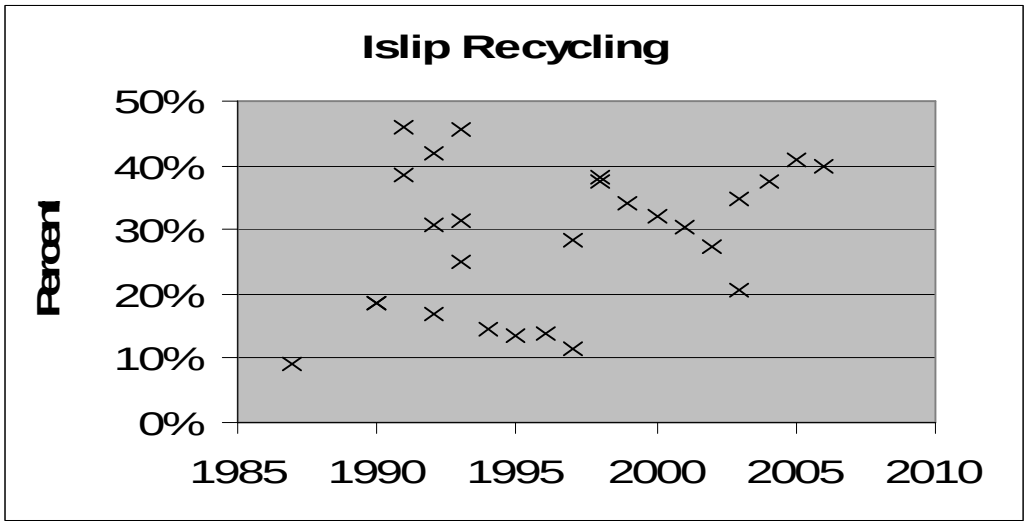
Recycling:

Curbside Paper	Curbside Containers	Bulk metal	Yard waste	Other recycling
11,910	4,691	845	59,271	61,298

The recycling statistics reflect collected, not marketed, tonnages. Other recyclables include abandoned cars, metal recovered at the incinerator, and reported tonnages from private transfer stations and carters operating in the Town.

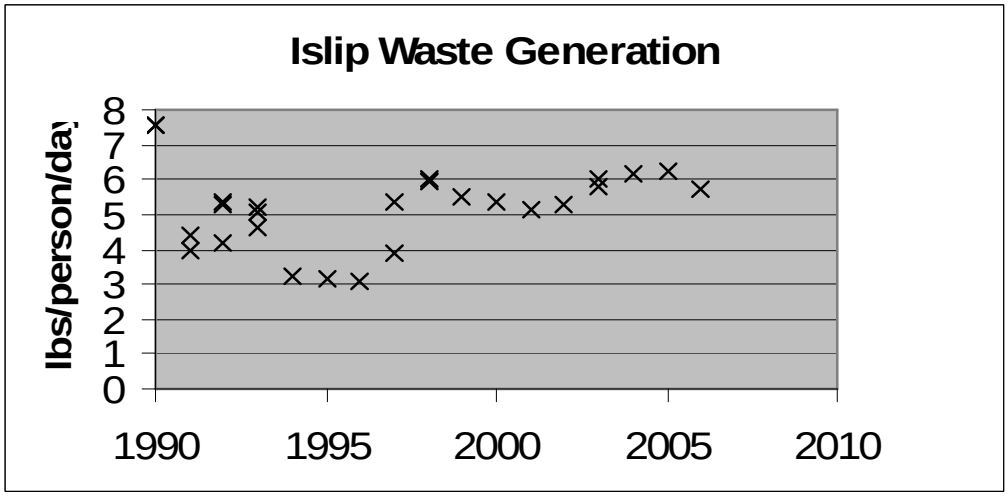
Waste management trends:

Recycling rates:



Recycling data from the mid-1990s was restricted to curbside tons; later assessments were more expansive.

Waste generation rates:



The Town has used consistent waste stream definitions since 1998.

Historical data:

Year	Recycled	Landfilled	Incinerated	Transported	Total
1985					330,000
1986					330,000
		275,000			275,000
1987					328,500
	32,500	327,500			360,000
1990	77,339	190,741	144,600		412,680
	77,339		260,000		412,680
1991	83,482		144,100		217,418
	110,000		144,100		240,000
			141,074		
1992	70,363				229,510
	122,700		170,604		293,304
	49,000		184,878		290,378
1993	63,105				252,299
	130,765		155,340		286,105
	86,518				276,012
			150,000		
1994	25,527		151,720		177,247
			151,000		
1995	23,408		151,000		174,408
			147,000		
1996	23,473		147,000		170,473
			155,000		
1997	24,643		193,000		217,643
			193,000		
	84,085				297,404
1998	126,500		168,000	42,600	337,100
			168,000		
	126,526				330,969
1999	106,000		155,000	50,600	311,600
			155,000		
2000	102,000		158,000	56,600	316,600
2001	93,000		146,500	65,436	304,936
2002	87,000		152,448	77,050	316,498
2003	125,000		156,375	79,300	360,675
	71,000		205,850	70,000	346,850
2004	139,000		146,014	86,724	371,738
2005	153,000		156,290	66,263	375,553
2006	138,645		161,413	46,395	346,453

1991 (1,2), 1992 (1,2) 1993 (1,2,3), 1994 (1), 1995(1), 1996 (1), 1997 (1), 1998(1), 1999 (1), 2000-2002, 2003 (1), 2004-2006: Town data
1985, 1987 (1): Legislative Committee on Water Resources reports
1986 (1), 1992 (2): LI Regional Planning Board reports
1986 (2), 1991 (2), 1993 (2), 1994 (2), 1995 (2), 1996 (2), 1997 (2), 1998 (2), 1999 (2): Legislative Committee on Solid Waste Management reports

1987 (2), 1990 (2): Newsday
1990 (1): NYPIRG, “A Legacy of Waste”
1997 (3), 1998 (3): NYSDEC Annual Recycling reports

Islip stopped accepting garbage at its landfill at the end of 1990 to conform with the LI Landfill Law. Its "transported" garbage went to other local incinerators (Babylon and Huntington) in the early 1990s under various Intermunicipal Agreements, and so those tonnages are included in the incineration tonnages. Currently, "excess" waste is managed by Winter Brothers through its Hicksville transfer station.

Town of Riverhead

Background:
The Town of Riverhead has a 2006 population of 33,098. The Town privatized waste management operations in the Town in the mid-1990s. The companies that have managed the Town waste stream have contractual obligations only for residential collection.

Collection:
Maggio Carting is the current Town waste management contractor. Maggio Carting operates the Town transfer station and provides residential collection services.

Two garbage and one recyclables pickup are provided each week, with separate collections of yard waste. Recyclables collections are for paper (newspaper, corrugated cardboard, junk mail, magazines, telephone books and catalogs) and containers (metal, plastic, and glass containers). Yard wastes are defined as leaves and brush; grass clippings are not managed by the curbside program. Loose yard waste, including grass clippings, can be brought to the Town composting site by Town residents (for a fee of $5 per day, or $25 per season).

The Town conducts at least one STOP day for hazardous household wastes each year at the landfill site.

Waste Management Facilities:
The Town operated a landfill until October 9, 1993. At that time, the landfill was closed, and the Town began to transport its garbage off-Long Island for disposal. In 1994, the Town established a garbage district for residential collection of garbage and recyclables, and upgraded its transfer station at the former landfill. The success of the district operations led the Town to turn over all collection operations (including management of the transfer station) to the contractor. At this time, the Town manages a yard waste compost site (for residential wastes only), the STOP day or days, and communication responsibilities for the residential waste contractor.

The Town is in the process of removing its former landfill. The original estimates of waste boundaries have proven to be inaccurate, and available funds to accomplish the task were exhausted with the job not yet completed. The Town

has sought a contractor with an acceptable bid offer to complete the landfill removal for more than a year.

Waste Disposal:
Garbage collected by Maggio Carting is transported for off-Long Island disposal. Recyclables are conveyed to local processors (containers currently go the Town of Brookhaven MRF, for instance). Yard waste is chipped and/or composted at the landfill composting site by the Town.

Solid Waste Statistics:
Data relating to Town waste disposal are sparse. Prior to 1993, there was no need to weigh materials disposed at the landfill, for instance. The private contractors have not been especially willing to share the statistics associated with their Town operations, and often have not filed annual reports with NYSDEC. The Town does not it has any further responsibility for waste management reporting at this time. Current data do not include any portion of the commercial, institutional, or multi-family waste streams

2006 waste management data:
Disposal:

Transported (tons)	Recycled (tons)	Total (tons)	Recycling Percent	Waste generation rate (lbs/person/day)
18,823	2,958	21,781	13.6	3.61

A confidential source provided data regarding Maggio Carting's 2006 tonnages. The data do not reflect any composting by the Town at the landfill.

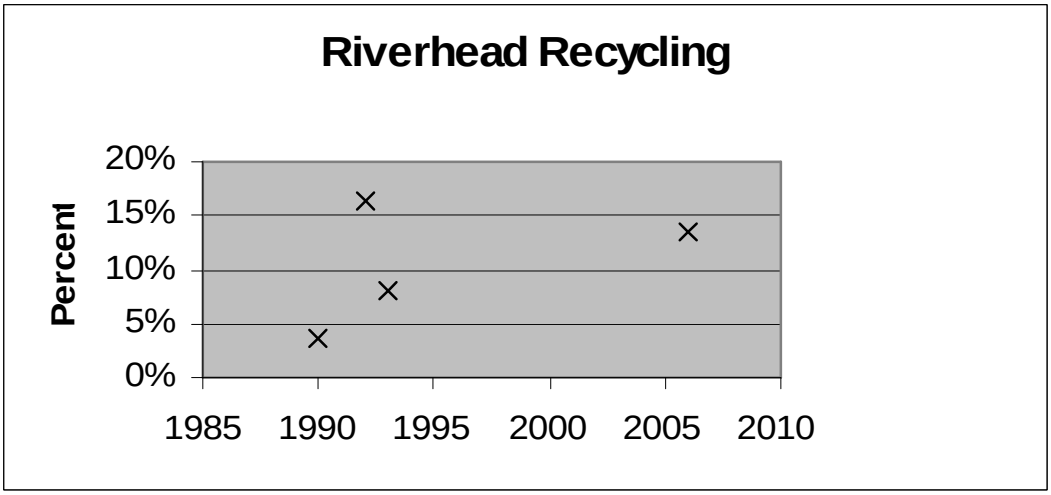
Recycling:

Curbside Recyclables	Yard waste
2,444	514

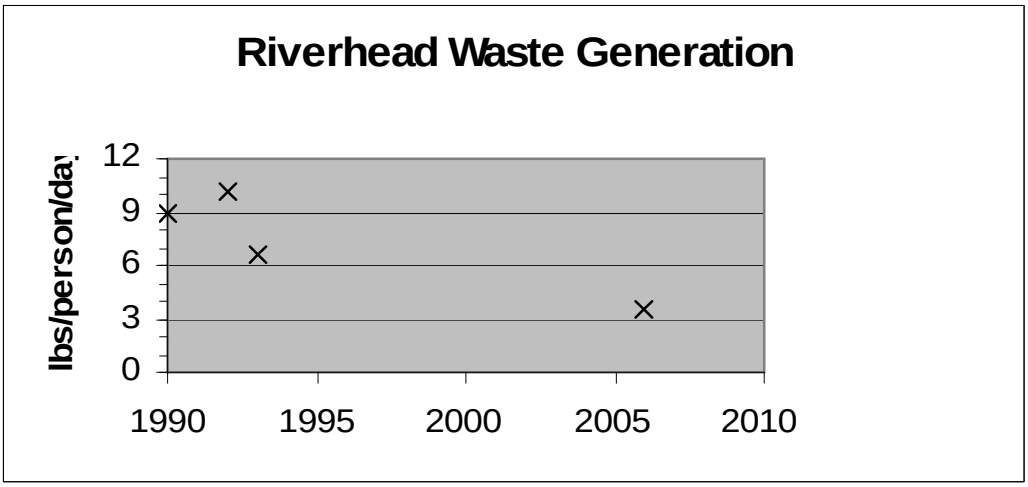
A confidential source provided data regarding Maggio Carting's 2006 tonnages. The data do not reflect any composting by the Town at the landfill.

Waste management trends:

Recycling rates:



Waste generation rates:



Historical data:

Year	Recycled	Landfilled	Transported	Total
1985				26,000
1986				29,600
		35,800		35,800
1987		26,000		26,000
1989	1,411			
1990	1,381	36,219		37,600
1992	7,000	36,000		43,000
1993	2,268	22,612	3,141	28,021
2006	2,958		18,823	21,781

1985, 1987: Legislative Committee on Water Resources reports
1986 (1): LI Regional Planning Board reports
1986 (2): Legislative Committee on Solid Waste Management reports

1990: Newsday
1992-1993: NYSDEC reports
2006: Maggio Carting, through confidential source

Data through 1993 represent the entire Town waste stream, most probably. Later data are residential wastes only.

Town of Shelter Island

Background:
The Town of Shelter Island has a 2006 resident population of 2,483. It is the smallest Town on Long Island, and is isolated, being an island in the Peconic Bay. A carting company provides service to homes and businesses, and to one small village, but it is assumed that all solid waste generated by residents, businesses, and institutions are managed through the Town facilities. The Town experiences a large seasonal increase in population due to the large percentage of “second home ownership.”

Collection:
The Town does not provide any collection services. Waste generators either contract with the private carter or bring their own wastes to the Town transfer station. Solid waste should be disposed in a Town bag. These bags are sold at two stores, Town Hall, and the landfill. This is called a “Pay-per-Bag” system. Because recyclables are free for disposal, this promotes source separation of recyclable materials. Garbage can also be disposed for 10¢/pound ($200/ton). In addition, the small-town ambience of the trip to the landfill site where Town employees can assist homeowners in making source separation decisions on a one-to-one, personal basis also increases the optimization of materials recovery.

Source separation occurs at the disposal point. Residents separate out newspaper, corrugated cardboard, office-type paper and magazines, glass, metal, and plastic containers, scrap metal, leaves, wood chips, and hazardous household wastes. Abandoned vehicles are accepted, but the market may dictate that a fee will be charged. Brush and stumps, furniture, C&D, propane

tanks, batteries, and white goods containing freon are accepted for a fee. The Town has a Landfill Ledge Treasure area, where residents may bring and swap items they believe others may wish to have.

Waste Management Facilities:
The Town closed its landfill in 1991. There is a transfer station, recyclables area, and waste processing facility there at this time.

Waste Disposal:
The Town ships its garbage off-Long Island via Mattituck Sanitation. Recyclables are marketed to primarily through Mattituck Sanitation, as well. The Town composts leaves, and grinds wood, brush, concrete, and glass on-site. Some of the compost is used to manufacture topsoil. These ground products, soil, and compost are all either sold or given away at the site (the Town will also deliver the products to homeowners).

Solid Waste Statistics:
The disposal tonnages reported by the Town are thought to represent all wastes disposed by Town waste generators, although it is unclear if Mattituck Sanitation delivers collected solid waste to the Town from its home and business stops. Recycling statistics are affected by the recovery of land-clearing wastes. Waste generation, considered on a per capita basis, is biased high by the large influx of summer visitors.

2006 waste management data:

Disposal:

Transported (tons)	Recycled (tons)	Total (tons)	Recycling Percent	Waste generation rate (lbs/person/day)
1,070	841	1,911	44.0	4.22

The Town also managed 1,228 tons of C&D through the transfer station.

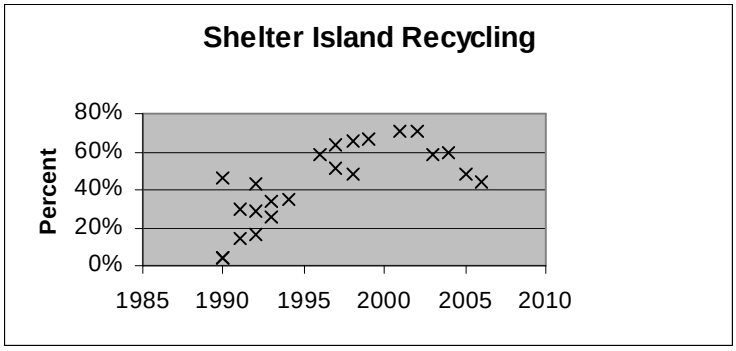
Recycling (tons):

Paper	Containers	Bulk metal	Yard waste	Other recycling
397	193	169	83	0

Recycling on Shelter Island is thought to be especially effective because of the potential for one-to-one interactions between residents sorting materials and transfer station workers. The Town did not report any recovered concrete or aggregate, or any metal containers this year.

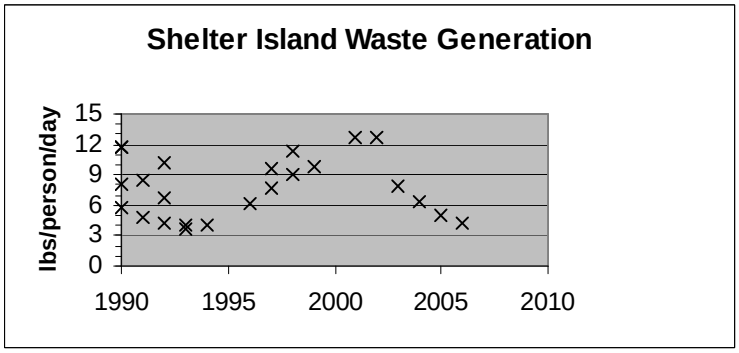
Waste management trends:

Recycling rates:



Recycling rates have declined as the Town has reported fewer tons of yard waste and concrete recycling.

Waste generation rates:



Reported waste generation rates have varied over time. Aggressive reporting of recyclables tonnages have resulted in larger waste generation rates, generally.

Historical data:

Year	Recycled	Landfilled	Transported	Total
1985				3,650
1986		4,928		4,928
				3,100
		3,500		3,500
1987		4,205		4,205
				3,650
				5,000
1988		4,198		4,198
1989		3,457		3,457
	760			
1990	400-800			
	1,100	1,300		2,400
				3,375
	208	4648		4,856
1991	500	2,500	500	3,500
	590			2,015
1992	750		1,000	1,750
	700	700	3,246	4,196
	800		2,000	2,800
1993	553		1,100	1,653
	373		1,100	
1994	576		1,061	1,637
1996	1,513		1,073	2,586
1997	2,106		1,196	
	2,106			4,119
1998	2,551		1,320	3,871
	2,359			4,871
1999	2,781		1,420	4,201
2001	3,667		1,552	5,219
2002	3,757		1,563	5,320
2003	1,985		1,443	3,418
2004	1,634		1,112	2,746
2005	1,075		1,163	2,238
2006	841		1,070	1,911

1986 (1), 1987 (1), 1988-1989, 1990 (1,2,3), 1991, 1992 (1), 1993 (1), 1994, 1996, 1997 (1), 1998 (1), 1999, 2001-2006: Town data
1985, 1987 (2): Legislative Committee on Water Resources reports
1986 (1), 1992 (2): LI Regional Planning Board reports
1986 (2): Legislative Committee on Solid Waste Management reports

1987 (3): Newsday
1990 (4): NYPIRG, “A Legacy of Waste”
1992 (3), 1993 (2), 1997 (2), 1998 (2): NYSDEC Annual Recycling and other reports

Shelter Island originally participated in the battle against the LI Landfill Law implementation, but closed its landfill in October 1991. It has exported its wastes

off-Long Island since that time. Recycling was fostered by the adoption of the per-bag system in 1993.

Town of Smithtown

Background:
The Town of Smithtown has a 2006 population of 119,605. The Town's waste management program covers all of the Town, including incorporated villages. The Town residential collection services, but the program does not cover commercial and institutional waste generators.

Collection:
The Town provides collection services to all one, two and three family residences in the Town. Two garbage and one recyclables pickup are provided each week. The Town has divided itself into 12 separate districts that are let out for bids from private companies. The Town collects white goods by separate collection, and the highway department collects set out leaves and brush. The Town does not manage grass clippings.

Recyclables collections are for paper (newspaper, corrugated cardboard, brown paper bags and magazines) and containers (metal, #1 and #2 plastics, and glass containers, and aluminum foil products). The Municipal Services Building accepts all curbside recyclables, electronic wastes, fluorescent bulbs, scrap metal, batteries, motor oil, antifreeze, residential project C&D, and yard waste.

The Town does not have a STOP program at this time.

Waste management facilities:
The Town has a Waste-to-Energy Facility that it financed jointly with the Town of Huntington. Covanta Energy will assume ownership of the plant in 2011. The Town closed its landfill in the early 2000s. At the old landfill site, the Town has its Materials Services Building. Recyclables are processed here to market conditions. The Town also has a cipping and mulch area at the old landfill.

Waste Disposal:
Garbage collected by the Town is disposed at the incinerator. Recyclables are marketed to materials brokers, if processed at the Municipal Services Building and to local processors if not upgraded by the Town. Leaves are not composted by the Town. Wood wastes are chipped at the landfill, and made available to residents or for municipal projects.

Solid waste statistics:
The disposal tonnages reported by the Town should reflect all of the residential waste generation within the Town. The Town won a court case soon after the *C&A Carbone v. Clarkstown* US Supreme Court decision rescinding flow control that allowed the Town to contractually obligate carters to bring residential wastes

to Town designated facilities, to enforce such contracts. The Town does not manage commercial and institutional wastes generated within the Town.

2006 waste management data:

The Town was unable to provide 2006 data.

Disposal:

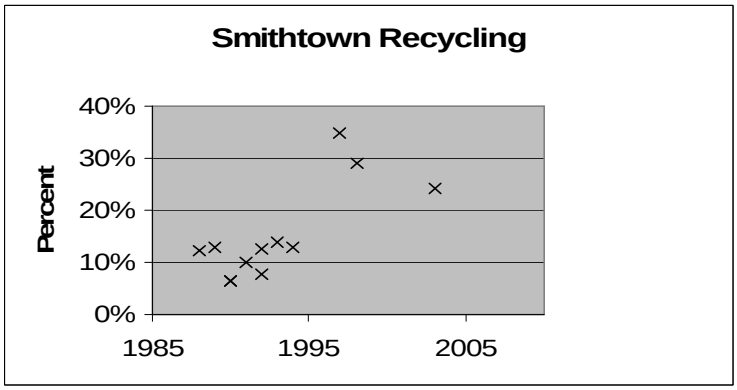
Incinerated (tons)	Recycled (tons)	Total (tons)	Recycling Percent	Waste generation rate (lbs/person/day)

Recycling:

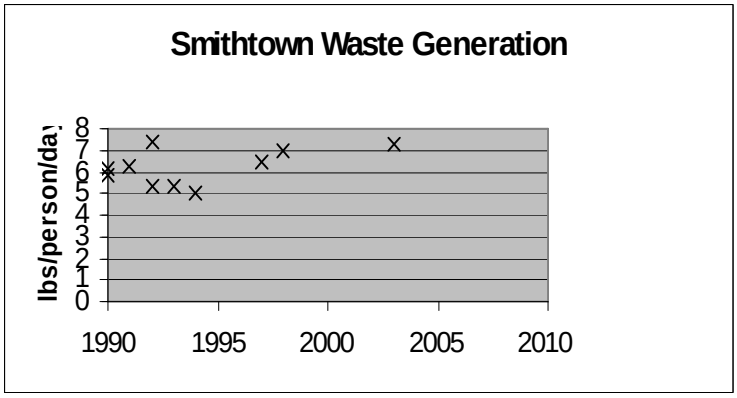
Curbside Paper	Curbside Containers	Bulk metal	Yard waste	Other recycling

Waste management trends:

Recycling rates:



Waste generation rates:



Historical data:

Year	Recycled	Landfilled	Incinerated	Total
1985				78,000
1986				173,500
		156,000		156,000
1987		128,805		128,805
				78,000
		110,000		110,000
1988	15,108	108,240		123,222
1989	16,402	112,406		128,448
	18,786			
1990	7,973	118,686		126,659
	13,652			
	7,973	113,958		121,929
1991	13,132	105,325	11,092	129,549
1992	13,815		96,302	110,117
	11,755	43,956	96,918	152,629
1993	15,189		94,782	109,971
1994	13,281		90,471	104,022
1997	46,632			133,389
1998	42,590			146,112
2003	37,853		118,646	156,229

1987 (1), 1988-1989, 1990 (1,2), 1991, 1992 (1), 1993-1994: Town data
1985, 1987 (2): Legislative Committee on Water Resources reports
1986 (1), 1992 (2): LI Regional Planning Board reports
1986 (2): Legislative Committee on Solid Waste Management reports

1987 (3), 1990 (3): Newsday
1997-1998: NYSDEC Annual Recycling reports
2003: WRMI

Smithtown landfilled its wastes until the Huntington WTE plant was operable in 1991 (Huntington tonnages landfilled in Smithtown are not reflected above). After 1991, the landfill only accepted C&D and similar material, which the Town chose not to include in solid waste reporting. The landfill closed in the early 2000s; since then, unprocessible wastes have been managed through the private sector after collection by the Town.

Town of Southampton

Background:
The Town of Southampton has a 2006 resident population of 58,876. The Town only provides waste management services to residents and small businesses that self-haul garbage to Town transfer stations, using Town bags (the Pay-per-Bag system). All other residents and businesses and institutions must arrange for services through private carting companies. The Town's summer population is much greater than the year-round population, due to the large number of second homes in this "Hampton" area.

Collection:
The Town does not provide any collection services. Waste generators either contract with a private carter or bring their own wastes to one of four Town transfer stations. Self-haulers dispose of wastes in a Town bag. These bags are sold at over 20 stores at various locations in the Town, the four transfer stations, and Town Hall. This is called a "Pay-per-Bag" system. Because recyclables are free for disposal, this promotes source separation of recyclable materials. Other wastes (such as brush, tires, C&D, bulky wastes, etc.) are also accepted for various fees. Large volume commercial waste generators may not use Town facilities. These restrictions minimize the number of users of Town facilities, and so Town employees can assist homeowners in making source separation decisions on a one-to-one, personal basis also increases the optimization of materials recovery.

Source separation occurs at the disposal point. Residents separate out paper (newspaper, corrugated cardboard, magazines, stationery, telephone books) and commingled containers (glass bottles, metal and aluminum cans and foil, #1 and #2 plastic containers). The Town also recycles leaves, clothing used motor oil, batteries, tires, propane tanks, and e-wastes (accepted at no charge), and brush, white goods, and commercial corrugated cardboard (with fees).

In 2007, the Town will have a STOP day at each transfer facility each year (four events in all) to collect residentially-generated hazardous wastes.

Waste management facilities:
The Town closed its satellite landfills in the 1980s, and converted the sites to transfer stations. The North Sea landfill remained open through 1995. The Town therefore has transfer station-recycling sites at Sag Harbor, North Sea, Hampton Bays, and Westhampton. All of these sites (except Sag Harbor) also have composting operations. The North Sea site is the main waste management location.

Waste Disposal:
The Town ships its garbage off-Long Island via the Winter Brothers transfer station (Babylon). Recyclables are sent to local processing sites. The Town

composts leaves, and grinds wood and brush on-site. It is trying to more successfully market the products it creates.

Solid waste statistics:
The disposal tonnages reported by the Town represent only part of the residential waste stream. The Town does not quantify yard waste that it manages.

2006 waste management data:

Disposal:

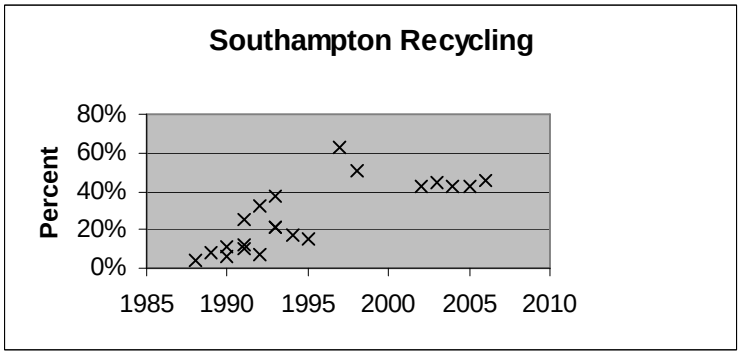
Transported (tons)	Recycled (tons)	Total (tons)	Recycling Percent	Waste generation rate (lbs/person/day)
6,628	5,548	12,176	45.6	1.13

Recycling (tons):

Paper	Containers	Bulk metal	Yard waste	Other recycling
2,149	1,399	839	Not quantified	1,161

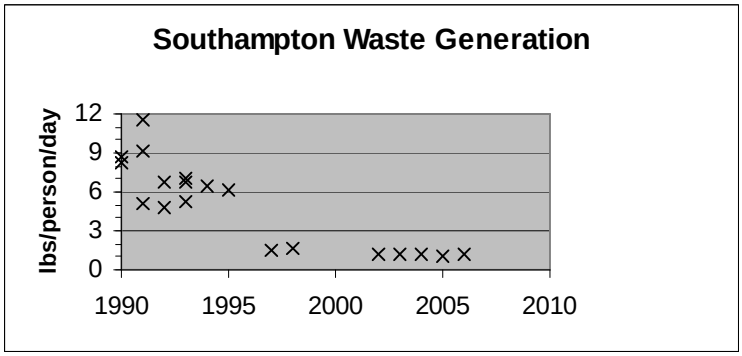
The Town does not quantify recyclables that do not have per-ton or other fees associated with their management.

Waste management trends:
Recycling rates:



Recycling percentages increased with the restrictions on access to the transfer stations and adoption of the Pay-per-Bag system.

Waste generation rates:



Per person per day waste generation rates are only relative for Southampton, due to the small percentages of the population that participates in the Town system.

Historical data:

Year	Recycled	Landfilled	Incinerated	Transported	Total
1985					55,000
1986					65,500
		80,000			80,000
1987	1,470	68,490			69,960
		45,000			45,000
1988	2,800	68,010			71,000
1989	6,240	68,400			75,000
	3,247				
1990	7,950	64,000			73,000
	4,447	64,553			69,000
1991	9,560	66,300			76,000
	24,560	66,300			96,070
	4,447	37,500			42,000
1992	3,752	52,600			56,352
	13,000	27,000			40,000
1993	21,365	35,000			56,500
	9,365	35,000			44,500
	12,500	49,065			59,284
1994	9,571	45,104			54,675
1995	7,975	44,193			52,168
1997	8,157				13,073
1998	7,299				14,438
2002	5,218		7,166		12,384
2003	5,715		7,235		12,950
2004	5,408		7,385		12,793
2005	5,022		6,670		11,692
2006	5,548			6,628	12,176

1987 (1), 1988, 1989 (1), 1990 (1), 1991, 1993 (1,2), 1994-1995, 2002-2006: Town data
1985, 1987 (2): Legislative Committee on Water Resources reports
1986, 1992 (1): LI Regional Planning Board reports
1986 (2): Legislative Committee on Solid Waste Management reports

1992 (2), 1997-1998: NYSDEC Annual Recycling and other reports
1987 (3), 1990 (2): Newsday

Southampton successfully applied for dispensation to maintain its landfill despite the LI Landfill Law. However, the Town unilaterally closed the landfill at the end of 1995 due to neighbor complaints. The Town has used local LI WTE incinerator plants for disposal, but currently ships off-Long Island. It is clear the Town currently processes only a fraction of the wastes generated in Town. Recycling rates were increased with the introduction of the Pay-per-Bag system in 1996. LI Location Map

Town of Southold

Background:
The Town of Southold has a 2006 population of approximately 30,000. While it is estimated that nearly all of the residential waste generated is managed through the Town facilities, nearly all commercial waste is managed through private Riverhead or Southampton facilities. Southold pioneered the "Pay-per-Bag" system on Long Island in 1993.

Collection:
The Town does not provide any waste collection services except for yard waste twice a year. Waste generators either contract with one of two local private carters or bring their own wastes to the Town transfer station (self-haulers). In 1993, the Town adopted a "Pay per bag" volume-based pricing system for residential waste. Residential waste must be disposed in a "Town" garbage bag, sold at many retail stores throughout the Town and some Town facilities. In 2004, this system was expanded to leaves, where biodegradable bags were required for leaves brought to the compost site (the Town sells bags, but paper bags sold at garden centers are acceptable, too). Recyclables disposal is at no charge. Other fees include a permit for use of the transfer station, for both residents and commercial users. Commercial wastes are accepted for tip fees, as are concrete, tires, C&D, and bulky items.

Source separation occurs at the "disposal sidewalk" at the transfer station, where residents separate out newspaper, corrugated cardboard, mixed paper (magazines, stationery, telephone books), glass containers, metal and aluminum cans and foil, #1 and #2 plastic containers, used motor oil, tires, batteries, hazardous household wastes, and fluorescent bulbs. Here, Town employees are available to assist and direct residents with their disposal/recycling efforts, and to answer any questions they may have. This point of contact optimizes materials recovery from the Town's source-separated recycling program. There is also a home exchange area where items of use may be left or taken (an attendant judges the reuse value of prospective items).

The Town contracts for 6 Household Hazardous Waste events each year and in 2007 began a similar program for e-wastes. The new transfer station is expected to allow for special collection and/or recycling opportunities (such as carpets and aseptic packages).

Waste Management Facilities:
The Town closed its landfill in 1993. The "temporary" long-haul transfer station was used for 13 years until a permanent facility was opened in 2006. The Town also operates a yard waste composting site for leaves and brush.

Waste Disposal:
The Town ships most of its garbage off-Long Island via the Omni Recycling transfer station (Babylon), and also sends some to the Huntington Waste-to-Energy plant. Recyclables are marketed to local processing sites, and also sold by the Town itself. The Town composted leaves and wood mulch are marketed to as free mulch to residents and then through sale to any buyer.

Solid Waste Statistics:
The disposal tonnages reported by the Town represent wastes managed through the transfer station but not commercially generated waste/debris managed outside of the Town system

2006 waste management data:

Disposal:

Transported (tons)	Incinerated (Tons)	Recycled (tons)	Total (tons)	Recycling Percent	Waste generation rate (lbs/person/day)
8,191	613	11,382	20,186	56.4	4.89

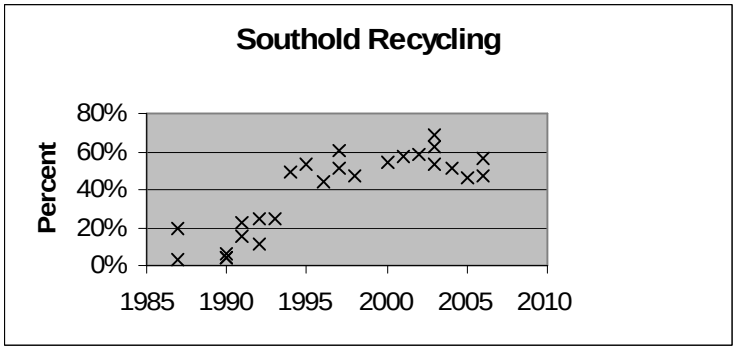
The Town also managed approximately 4,026 tons of C&D through the transfer station.

Recycling (tons):

Paper	Containers	Bulk metal	Yard waste	Other recycling
2,727	1,057	316	6,157	1,125

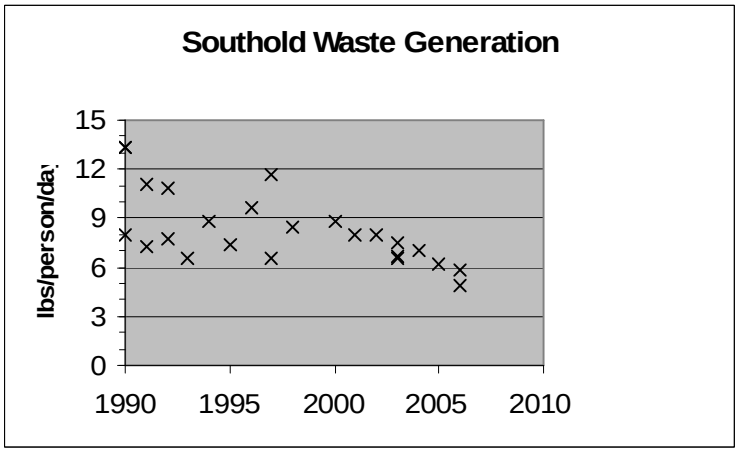
Recycling in Southold is thought to be especially effective because of the potential for one-to-one interactions between residents sorting materials and transfer station workers. Other recycling includes asphalt and concrete (currently stockpiled).

Waste management trends:
Recycling rates:



Recycling percentages increased following adoption of the Pay-per-Bag system. Some data reflect C&D recycling.

Waste generation rates:



The Town has been less aggressive in seeking recycling credits in some of its filings post-1994, and has seen more commercial wastes managed by private haulers through out-of-Town transfer stations, which has decreased overall waste generation rate accountings.

Historical data:

Year	Recycled	Landfilled	Incinerated	Transported	Total
1985					20,000
1986					31,000
		23,400			23,400
1987	1,124	36,500			37,500
	7,000	28,000			35,200
		20,000			20,000
1990	1,919	46,199			48,108
	1,927	27,131			29,058
1991	6,317	33,604			39,921
1992	7,049	21,039			28,088
	4,438	34,875			39,313
1993	5,788	18,088		2,772	23,876
1994	15,777			16,531	32,308
1995	14,605			12,803	27,408
1996	15,699			19,937	35,636
1997	14,813			9,507	24,320
	22,248				43,462
1998	15,272			16,844	32,116
2000	18,020			15,093	33,113
2001	17,503			12,810	30,313
2002	17,901			12,540	30,441
2003	16,104			9,836	25,940
	15,780			13,574	29,354
	17,810			8,031	25,841
2004	14,579			13,844	28,423
2005	11,656		87	13,264	25,007
2006	11,382		613	8,191	20,186
	11,382		613	12,217	24,212

1987 (1), 1990-1991, 1992 (1), 1993 (1), 1994-1996, 1997 (1), 1998-2002, 2003 (1,2), 2004-2006: Town data
1985, 1987 (2): Legislative Committee on Water Resources reports
1986 (1), 1992 (2): LI Regional Planning Board reports
1986 (2): Legislative Committee on Solid Waste Management reports

1997 (2): NYSDEC Annual Recycling report
2003 (3): WRMI

Southold closed its landfill October 9, 1993 to come into compliance with the LI Landfill Law. It has shipped most of its disposed MSW off-Long Island since then, but has recently begun to access local incinerator capacity from time-to-time. Most post-1994 data reported by the Town do not include C&D recycling, and do count C&D disposal. Recycling was fostered by the adoption of the per-bag system in 1993.

Suffolk County

Six larger solid waste transfer stations were identified in Suffolk County. Five other facilities reported managing solid waste in 2006.

Table 5 Suffolk County MSW Transfer Stations (in tons) (cubic yards in parentheses)

Company	Hamlet	MSW In	C&D In	Municipal Inputs	Recyclables Out	MSW Out	MSW Disposal Points
Omni	Babylon	278,206	112,424	Village of Westbury, Long Beach; yard wastes from Babylon and Huntington; recyclables from Huntington[1]			Off-LI; Babylon RRF
Jet Paper[2]	Islandia	123,633	6,334		25,816	97,818	Off-LI; ~2,000 Omni Babylon, Huntington RRF
Selas[2]	Holtsville	100,796	69,812		1,718	105,094	Off-LI; 1,560 Hempstead RRF, 2,066 Huntington RRF; 954 Omni Babylon
Winter Bros.[3]	Holtsville	54,340	4,416		285 (960)	54,855	Off-LI; 5,444 Hempstead RRF; 7,466 Huntington RRF
Crown Recycling	Calverton	42,927	66,706		10,363	43,010	Off-LI; 1,705 Huntington RRF
D&T Paper	Bohemia	42,312			3,489	38,534	Off-LI; 73 Huntington RRF
Waste Management	Yaphank	39,363	43,768		1,218	38,410	Off-LI
Paragon	West Babylon	18,635	5,087		5,111	15,427	Off-LI
Emjay	Brentwood	10,888	69,490		6,176	15,484	Off-LI
Winter Bros.	West Babylon	405	145,111		30,206	253	Huntington RRF

Company	Hamlet	MSW In	C&D In	Municipal Inputs	Recyclables Out	MSW Out	MSW Disposal Points
Schleider[4]	Kings Park	90[5]	13,171				
Great Gardens	Yaphank	55,461[6]		Brookhaven[6]	54,530	931	724 Selas; 207 Winter Bros.
Totals		**712,716**	**531,903**		**138,627**	**354,961**	

[1] Village of Westbury MSW was not quantified. Long Beach MSW was 23,560 tons. Huntington delivered 24,802 tons of yard waste and 4,563 tons of containers. Babylon is thought to have delivered ~20,000 tons.
[2] 2005 data
[3] Winter Brothers operated the "Selas" facility for only 4 months (Sep.-Dec.) in 2006. The data preceding this entry is for the entire calendar year and so was utilized for the report. If Winter Brothers continues to operate the facility as it had, it will manage more MSW and less C&D than it did in 2005, and a larger percentage of the MSW will be incinerated on LI.
[3] Separate filing for more C&D for this site (see below)
[4] Grass clippings
[5] All yard waste
[6] Brookhaven delivered 34,557 tons.

The following transfer stations managed construction and demolition debris only. Disposal points are for MSW only. No recycling was assumed unless specified, although many of the reports seemed to imply that materials were not disposed but were instead reused.

Table 6 Suffolk County C&D Transfer Stations

Company	Hamlet	C&D In	Recyclables Out	MSW Out	MSW Disposal Points
All State Rubbish[1]	Patchogue	(25,760)	256 (1,270)		Island Waste
BLHC	Bay Shore	15,554	5,818		
Belli	Brentwood	121,136			
Bistrian Gravel	East Hampton	1,077	1,077		
CB Recycling	West Babylon	(25,208)	(16,054)		
Colossal[1]	Southampton	14,932	1,454 (1,270)		
DeMatteo Salvage	West Babylon	3,187	1,875		
Excel	Medford	106,542	4,280		
Get Rid of It	Holbrook	(10,068)	(2,640)	1,020	Islip RRF
Islandwide	West Babylon	2,795	2,241	60	Hempstead RRF
National Waste	Bay Shore	30,000	6,625		
North Fork	Cutchogue	(21,554)	(4,400)		
Park Line	Brookhaven	500			
South Shore	Bay Shore	250,813	184,005		

Company	Hamlet	C&D In	Recyclables Out	MSW Out	MSW Disposal Points
Materials					
Tri-Town	Bay Shore	54,649	13,786		
USA Recycling	Kings Park	17,206	1,789	1,433	1,383 Huntington RRF; 107 Winters Bros. West Babylon; 43 Waste Man., Glen Cove
Waste Sorting	Ronkonkoma	236	11,209		
Totals		**618,627 (82,590)**	**234,415 (25,634)**	**2,513**	

[1] 2005 data

The following filed C&D reports, but the materials managed were only aggregates or soils. Others managed aggregates and land-clearing debris (brush and wood), or brush or trees only. Many of these facilities report 100 percent recoveries. It is not known for some whether the materials were recovered on site or were transferred elsewhere.

Table 7 Suffolk County Aggregate/Soil Processing Facilities/Transfer Stations (in tons) (cubic yards in parentheses)

Company	Hamlet	Aggregates In	Recyclables Out
110 Sand	Melville	155,806	155,806
Barsic	Babylon	(14,039)	
Brinic	Ronkonkoma	2,448	
Construx	Babylon	53,792	53,792
Corrazini Asphalt	Cutchogue	6,010	6,010
D'Agostino	Kings Park	(4,385)	(4,385)
Edwards	Bay Shore	30,008	28,412
Grimes Contracting	East Hampton	2,088	(12,917)
Holbrook Truck	Ronkonkoma	10,990	1,920
Huntington Ready Mix	Speonk	500	500
Izzo Brothers	Kings Park	22,350	3,550
Kings Park Asphalt[1]	Kings Park	70,020	1,720
Kurrass Materials	East Patchogue	(46,992)	
LLL Industries	Center Moriches	145	
Lakeland[2]	Ronkonkoma	(1,876)	
Montecalvo Asphalt	Kings Park	1,944	1,944
Pure Recycled	Holtsville	50,733 (100)	88,088
Rason Asphalt	Melville	20,956	30,000
Riley	Bay Shore	9,585	
Scatt Materials[1]	Bay Shore	5,800	4,500
Schleider[2]	Kings Park	6,679	
Skyline	East Setauket	238,230	238,230
Suffolk Asphalt	Hauppauge	603	
	Westhampton Beach	850	850
TS Haulers	Calverton	27,300	
Watbro	Bay Shore	35,188	15,401
Westhampton Mining	Westhampton	19,320	22,320
Totals		**771,345 (67,392)**	**652,953 (17,302)**

[1] 2005 data
[2] Two filings

Table 8 Suffolk County Aggregate, Land-clearing, Other Non-building Materials Management Transfer Stations (in tons) (cubic yards in parentheses)

Company	Hamlet	C&D In	Recyclables Out
Chesterfield	Westhampton Beach	3,206	3,206
Custom Earth	Bay Shore	(39,757)	(56,501)
East Coast Mines	East Quogue	18,450	17,840
Global Land	Brookhaven	49,309	49,309
Guillo Contracting[1]	Southampton	19,664	19,664
Hampton Sand	Speonk	(112,431)	(60,000)
Lakeland[2]	Ronkonkoma	(3,070)	
Mezynieski	Southampton	6,450	
Norsic[1]	Southampton	(1,613)	
Northeast Recycling	Bay Shore	69,401	44,140
Recycled Earth[1]	Kings Park	(237,500)	(200,000)
Roanoke Sand	Middle Island	107,120	107,120
Shelter Island Sand[2]	Shelter Island	616	616
		4,352	3,942
Wainscott Sand	Wainscott	22,300	16,010
Totals		**326,502 (394,371)**	**261,847 (316,501)**

[1] 2005 data
[2] Two filings

Private sector waste management therefore might be summarized as follows. The accounting is somewhat tentative, for the following reasons:

1) many reports did not adequately describe the fate of materials that were managed
2) some of the reports that did summarize the fate of the materials described paths that result in double-counting, as materials were sent to other firms that may (but usually did not) show that the material had previously been documented by another reporting organization
3) the material of primary interest in this report, MSW, was usually co-managed with C&D in the facilities, and so the disposal and recycling tonnages reported probably do not solely reflect MSW
4) some key 2006 reports were not accessed or were not for the complete year, and so 2005 data were used
5) some important facilities appeared to not file reports (or the reports were not posted, if filed)
6) some of the municipal recycling data includes C&D and similar materials; the accountings for the private sector have tried to avoid adding C&D to MSW totals

Table 9 Private Sector MSW Transfer Station Summary Table (in tons)

	MSW Managed	Recycled	MSW Disposed on LI	MSW Disposed off-LI
Nassau County	208,909	150,751	6,947	44,498
Suffolk County	712,716	138,627	6,657	348,304
Total	**921,625**	**289,378**	**13,604**	**392,802**
Net[1]	**802,024**	**197,380**		

[1] Minus tonnages accounted at other facilities or by municipalities

The management of C&D materials is a major effort for private firms. The accounting above distinguished between companies that more generally managed "construction and demolition" materials and those that did not manage these mixed waste stream. It is clear that at least some materials were managed through more than one facility, resulting in double counting. However, the data reports are not complete enough to make any sort of a net computation for these materials flows.

Table 10 Private Sector Transfer Station C&D Summary Table (in tons) (cubic yards in parentheses)

	C&D Managed	Recycled	MSW Generated	Other Materials Managed	Recycled
Nassau County	230,568 (424,322)	26,761	840	199,200 (8,075)	148,920 (38,075)
Suffolk County	1,150,530 (82,590)	234,415 (25,634)	2,513	1,097,847 (461,763)	914,800 (333,803)
Total	**1,381,098 (508,912)**	**261,266 (25,634)**	**3,353**	**1,297,047 (469,838)**	**1,063,720 (371,878)**

In addition to the points raised above, the following factors need to be considered. Winter Brothers has major solid waste transfer operations in Babylon (receiving Town of Southampton wastes) and Westbury (official management point for Town of Islip excess wastes), but no NYSDEC reports (including those pre-2006) were found showing that MSW was managed through these sites. Winter Brothers is now operating the former Selas facility in Holtsville, which may partially explain the lack of information in 2006 filings. Disposal of much of the solid waste in Nassau County managed by private carting companies appears not to be well-documented. It may be that the collection trucks deliver directly to Long Island disposal facilities and not to transfer stations, since there appears to be approximately 200,000 tons of wastes managed through the Babylon, Hempstead, and Huntington plants that have not been explicitly identified as coming from a municipality or a particular transfer station. It may be that the collection trucks deliver to transfer stations in Brooklyn (there are not many private transfer stations in Queens) or even to Suffolk County facilities. It may be that the Nassau County transfer stations do not accurately report the wastes they receive, or perhaps some facilities are managing solid waste but do not hold the proper permits.

Waste Disposal Facilities

The Long Island Landfill Law made it nearly impossible to landfill garbage on Long Island. The means for managing MSW on Long Island are therefore restricted to recycling, incineration, and off-Long Island transport.

This report will not quantify Long Island recycling activities at the various facilities, due to the difficulty in obtaining complete information in a timely fashion. The following tables show 2006 data for the four operating Waste-to Energy incinerators on Long Island and the five landfills still operating, and list known recycling facilities and municipal compost sites.

Table 11 2006 Long Island Waste-to-Energy Incinerators (in tons)

Name	Operator	Municipal	Total
Hempstead	Covanta	829,651	946,288
Babylon	Covanta	201,560[1]	228,273
Huntington-Smithtown	Covanta	262,591[2]	327,036
Islip	Montenay	171,157	171,157
Totals		**1,458,527**	**1,672,754**

[1] 2003 Babylon data
[2] 2003 Smithtown data

Table 12 2006 Long Island Landfills (in tons)

Name	C&D	Cleanfill	Ash	MSW	Total
Babylon Northern U			153,651		153,651
Brookhaven Cell 6	534,737	62,021	314,799	5,902	917,460
Islip Cleanfill	168,626				168,626
Port Jefferson CC	~150				~150
110 Sand		615,076			615,076
Total	**703,513**	**677,097**	**468,450**	**5,902**	**1,854,963**

Table 13 Municipal Source-separated Recyclables Management Sites

Town	North Hempstead Transfer Station
	Brookhaven Waste Management Facility
	East Hampton Waste Management Facility
	Huntington Recycling Center
	Islip MRF
	Smithtown Municipal Services Facility
Village-District	Village of Floral Park (Hempstead)
	Fishers Island MRF (Southold)
	Village of Lynbrook (Hempstead)
	Old Westbury Transfer Station (North Hempstead)
	Sanitary District #1 (Lawrence) (Hempstead)
	Valley Stream Transfer Station (Hempstead)

Table 14 Private Source-separated Recyclables Management Sites

County	Name	Hamlet
Nassau	Omni Recycling	Westbury
	P&P Paper	Bethpage
	Recycling Associates	Hicksville
	S&M Prompt	Valley Stream
	Waste Management	Glen Cove
Suffolk	All Waste	Bay Shore
	Babylon Paper	West Babylon
	Bead Brite Glass	Hauppauge
	Colossal	Southampton
	D&T Paper	Bohemia
	DeMatteo Salvage	West Babylon
	Ed's Salvage	Ronkonkoma
	Olympic Fibres	Coram
	Omni Recycling	Babylon
	One World Recycling	Lindenhurst
	Paragon	West Babylon
	Waldbaums	Central Islip
	Winter Brothers	West Babylon

Table 15 Municipal Compost Sites

Municipality	**Site**
Brookhaven	Holtsville Landfill (Brookhaven) Manorville
East Hampton	Springs-Fireplace Rd.
Islip	Ronkonkoma
Riverhead	Landfill
Shelter Island	Landfill
Southampton	Hampton Bays North Sea Westhampton
Southold	Landfill

Transportation Issues and Solid Waste – by: Donald H. Nohs

Introduction

"A picture is worth a thousand words."

This quote is sometimes attributed to Napoleon Bonaparte, who said "Un bon croquis vaut mieux qu'un long discourse," or "A good sketch is better than a long speech"

Heavy traffic volumes, chronic congestion, safety deficiencies, poor pavement, overtaxed bridge conditions, and pollution are just some of the important factors in searching for alternative means of moving waste or freight by other than solely relying on trucks. The Cross-Bronx Expressway is a key part of the East Coast I-95 corridor, and trucks are a quarter of the vehicles traversing the Bronx segment.

In fact, we do not have a choice in seeking alternative means of transportation. The freight transportation network is at a major crossroad. It relies on trucks to move the majority of goods entering the region and suffers from chronic roadway congestion throughout most of the day. As the demand for goods is expected to grow roughly 70% above existing levels by 2025, the freight system needs to be substantially upgraded to prevent traffic congestion from constraining economic growth. One way to do this is by expanding rail freight which can mitigate this increase somewhat. However, there still remains resistance from the public and there is a lack of sufficient public investment.

Scope of Report

This report will focus primarily on the two on-land methods (truck and rail) of transportation for the long-haul disposal of residential and commercial waste out of Suffolk County. We will review the history of long-hauling waste, look at some study reports, an actual case study, and then make a determination and recommendation regarding the best means of long-hauling waste for disposal out-of-state.

History of Long-Hauling Waste

Historically, the main mode of long hauling waste has been by truck. Waste has been shipped in just about every type of truck imaginable. The first type of *long-haul* trailers used were *push out* trailers. These trailers were very heavy. The focus of a transfer station was to enable a three-to-one reduction (three packer truck loads to one transfer trailer). This did succeed in taking packer truck traffic off the road headed to the landfill where there would be a line sometimes of thirty packer trucks or more at the landfill up to an hour before the landfill opened. *Long Haul* at that time (about 30 years ago) meant a radius of approximately no more than fifty miles.

The first transfer stations were owned and operated by the owners of hauling or carting companies. They did not start out as stand alone business as we find today. The owner of the hauling company wanted to reduce the amount of waste for disposal and number of trips to the landfill. At first, the only item recovered from the waste stream was OCC (old corrugated container). Historically there has always been a good market for OCC. There was also plenty of OCC in the loads of waste. Many supermarkets today and other high generators of OCC bale or sell it loose themselves to a recycler. Thirty years ago OCC was thrown out in the loads of waste. The transfer station did in fact succeed in securing a three to one reduction with the recovery of OCC.

The driving factor to look beyond a fifty mile radius for disposal has always been economics. There was no problem with local disposal space. There were plenty of local landfills around, but the local tip fee was found to be higher than out-of-state landfills, much higher. The tip fee at Fresh Kills landfill thirty years ago was $60.00 to $80.00 per ton. Garbage was tipped by the yard at that time and with the conversion from yards to tons the $60.00 to $80.00 per ton was the variable arrived at.

Long-hauling waste out-of-state originated in Brooklyn and Queens. This is the reason for looking at Fresh Kills landfill tip fee as opposed to landfill tip fees in Suffolk County.

At the time Fresh Kills tip fee was at this price range it was found that landfills in Ohio, Pennsylvania and Virginia were charging tip fees as low as $6.00 per ton. The T&D (trucking and disposal) number for these out-of-state landfills at that time was about $36.00 per ton. With savings, companies on Long Island started looking to long-haul their waste.

As the push-out type trailers were heavy, transfer stations started looking for lighter trailers to increase their payload for even greater savings. This gave birth to the “walking floor” type trailer. The original walking floor trailers were between 85 to 100 yards and made of steel. The same trailers were soon being made out of aluminum to lighten the trailer and increase the payload. With the trailers now

being made lighter, to get more of a payload, these lighter trailers yardage was being increased to 110 and even 120 yards. A walking floor trailer at that time, like a push-out trailer was considered a dedicated trailer, meaning you could only haul material one way. Your truck and trailer were returning empty. To further increase savings, transfer stations started baling waste to open up the type of trailers that could be used. With baled waste, one could use box trailers or flat bed trailers to long haul waste. With baled waste you were guaranteed to get the maximum payload on a trailer. There was savings on transportation as the flat beds and box trailers were owned by out-of-state truckers looking to back haul loads. A typical flat bed trucker would pick up a load of steel in Pennsylvania, deliver it to New York and stop off at a transfer station to pick up baled garbage as a load to back-haul on his return trip. As more transfer stations found out how cheap out-of-state disposal was, they were soon offering the truckers (back haulers) more money to secure their own waste for out-of-state disposal. The transportation cost for long hauling started to slowly rise. Other means were soon looked at as transfer stations needed to keep their disposal costs down to keep the competitive edge. Railing solid waste was tried 25 years ago. At that time, garbage was baled and then loaded into box cars. Railing waste was in its infancy. Raw garbage was baled and loaded into box cars. Garbage was not placed in environmentally safe intermodal containers nor were bales of garbage shrink-wrapped for transport. No one ever thought about the impact on the environment if rail cars sat on rail tracks for any extended period of time or of odors emitting from rotting garbage. So when this happened on a number of occasions, it caused uproar in the communities where these events occurred. These events of course brought about the demise of shipping waste by rail. Subsequently, when NY&A took over Long Island Rail Road freight operations in 1997, it was immediately slapped with a moratorium on waste shipments. (This moratorium as of this writing has been lifted.

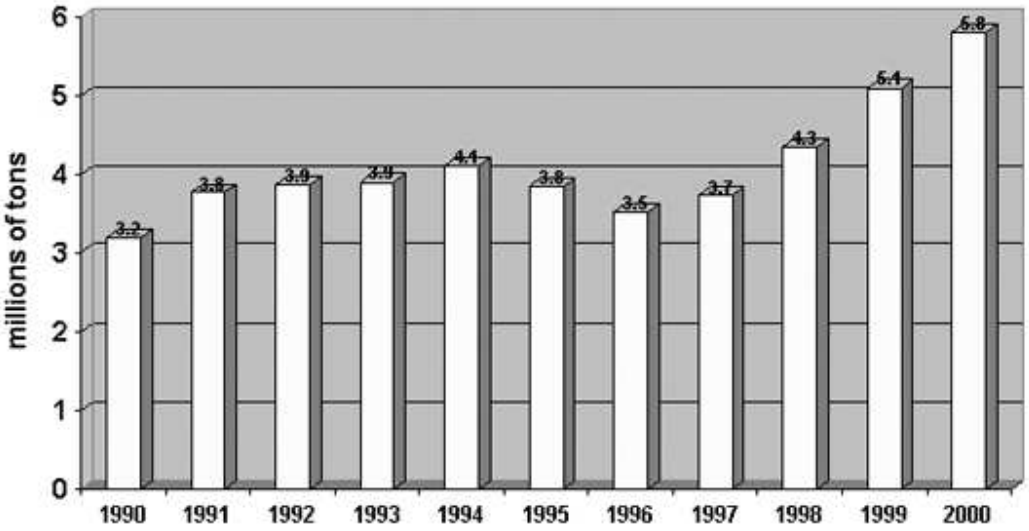
Barging was also tried as a means for long-hauling waste. Again garbage was baled and placed loosely on a barge and twenty years ago, on March 22, 1987 the Mobro 4000, a tugboat, pulled a barge full of Long Island's baled raw trash. The

waste was to be shipped via barge to a southern landfill in North Carolina. There was a concern that the garbage from New York might contain hazardous waste and they did not want it. Instead, Mobro 4000 wandered from port to port for months but was never allowed to stay and unload. Lousiana, Alabama, Mexico and Belize all rejected the waste. The Mexican Navy met the barge in the Yucutan Channel, forbidding it to enter Mexican waters. By June 1987, the garbage had been refused by six states, and three countries. The garbage was eventually burned at an incinerator in Brooklyn and the ashes disposed at Islip landfill. The long-hauling waste by barge was at an end.

New York City transported to the Fresh Kills landfill 20 barges of loose raw garbage from Brooklyn to Staten Island everyday, each carrying 650 tons. Amid a storm of flash bulbs and fanfare, Staten Island's infamous Fresh Kills landfill received its final barge load of New York's waste on March 22, 2001. Ironically 14 years earlier on the same date saw the start of the ill-fated journey of the Mobro barge.

The closing of Fresh Kills Landfill added 1,000 trucks daily to New York’s already overburdened infrastructure. Between the years 1990 and 2000, there was a steady increase in long-hauling waste out-of-state with a drastic increase between 1997 and 2000, as shown in Fig. 1, due to the phasing out of Fresh Kills landfill.

Out-of-State Disposal
1990-2000



The Out-of-State Disposal graph illustrates the annual tons of MSW exported out of New York State for disposal. The 81.3 percent increase in annual exports from 1990 to 2000 is primarily attributable to increased diversion of waste from disposal at Fresh Kills landfill, as it has been phasing out of operation since 1997.

From The 2001 edition of *Where Will the Garbage Go?*

Fig (1)

These are the factors that limited long hauling waste to truck transport only.
This surge in truck traffic could have dire consequences for the State's traffic safety, congestion, road, and bridge conditions, and air quality. Per mile traveled, trucks are 20 percent more likely to be involved in a fatal collision than cars. Statewide, trucks were involved in 82 traffic deaths in 2002. But with truck mileage expected to increase by 80 percent, that figure could rise to as high as 133 by the year 2020.

The Impact of the Increase in Truck Traffic

Below are some excerpts from a report provided by The Road Information Program (TRIP).
Founded in 1971, TRIP is a nonprofit organization that promotes transportation policies that relieve traffic congestion, improve road, and bridge conditions, improve air quality, make highway travel safer, and enhance economic productivity.

KEY FACTS ABOUT NEW YORK'S ROAD AND BRIDGE

The nation's roads and highways are the backbone of the U.S. transportation system, providing Americans with approximately three trillion miles of travel annually. From commuters heading to work, people driving to stores, church or the doctor's office and businesses shipping goods to customers throughout the nation and around the globe, Americans depend on good roads in their communities.

But there are problems on our nation's roads, highways and bridges. With traffic congestion worsening and road and bridge deterioration continuing, the U.S. Department of Transportation estimates that the current backlog of unfunded but needed road, highway and bridge repairs and improvements is currently $461 billion.

In 2009, Congress will be required to reauthorize the current long-term federal surface transportation program--the Safe, Accountable, Flexible, and Efficient Transportation Equity Act - A Legacy for Users (SAFETEA-LU). This legislation will have a significant impact on the future condition and traffic congestion levels of the nation's key roads, bridges, and highways.

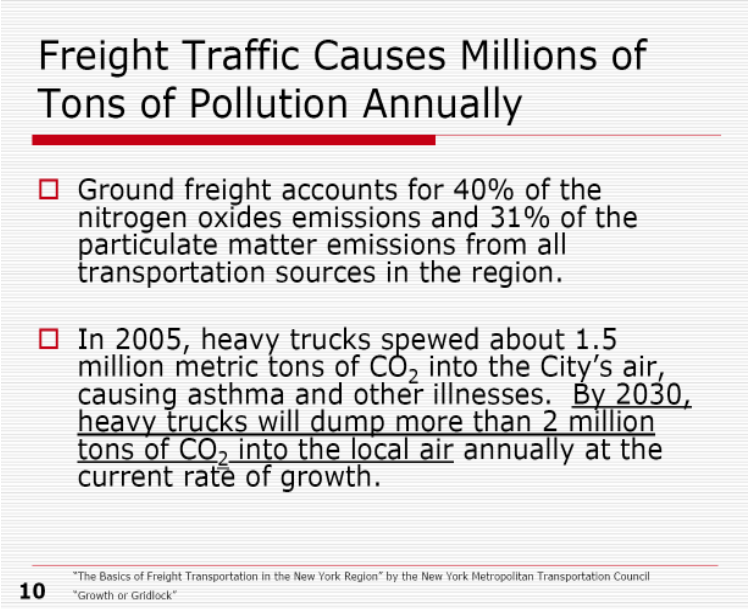
- Our nation's highways, transit systems, railroads, airports, ports and inland waterways drive our economy, enabling all industries to achieve the growth and prosperity that have made America strong and prosperous.
- The USDOT study also states that every dollar invested in the nation's highway system yields $5.40 in economic benefits in reduced delays, improved safety and lower vehicle operating costs.
- Seventy-three percent of the $318.8 billion worth of commodities delivered annually from sites in New York is transported by trucks on the State's highways.
- Driving on roads in need of repair costs New York motorists $4.4 billion a year in extra vehicle repairs and operating costs – $398 per motorist.
- Traffic congestion costs American motorists $63.1 billion a year in wasted time and fuel costs. Americans spend 3.7 billion hours a year stuck in traffic.
- Motor vehicle crashes cost New York $19.5 billion per year, $1,027 for each resident, in medical costs, lost productivity, travel delays, workplace costs, insurance costs, and legal costs.

Current Road and Bridge Conditions, Travel Trends and Traffic Congestion

- Forty-four percent of New York's major roads are in poor or mediocre condition.
- Thirty-eight percent of New York's bridges are structurally deficient or functionally obsolete.
- Thirty-four percent of New York's major urban highways are congested.
- Vehicle travel on New York's highways increased by 29 percent from 1990 to 2005.

Air Pollution Caused By Increased Truck Traffic

Figure 4 supplied by CSX shows the amount of emissions released to the atmosphere due to truck traffic.



(Fig 4)

One main form of air pollution which makes asthma worse is: particles from combustion e.g. car and diesel engines, industry, domestic coal and wood and bush fires as well as dirt and sand. Diesel exhaust is an asthma trigger especially the tiny particles which can travel into the lower airways and are believed to trigger asthma and other respiratory conditions.

Pollution is a very important factor to take into consideration in our day and age when determining how best to long-haul our waste. We have the capability today to determine the amount of pollution which will be released into the atmosphere through truck or rail transport. CSX Transportation launched an online Carbon Calculator, giving shippers and others the ability to make the best environmental choice of transportation options. The user-friendly tool quickly calculates the carbon dioxide (CO^2) emissions savings of specific rail shipments, providing comparative data among transportation choices. The Carbon Calculator, accessed through the company's web site, www.csx.com, prompts users to enter their shipment's weight and miles shipped and return the estimated CO^2 savings of shipping by rail.

The U.S. Environmental Protection Agency (EPA) estimates that shifting 10 percent of long-haul freight from the highway to rail would reduce annual greenhouse gas emissions by more than 12 million tons.
With the Carbon Calculator (Fig 5) one can input the miles to travel. In our scenario we will use Apex Landfill in Ohio. The Landfill is 400 miles from Suffolk County. The total weight of the freight to be moved is 1,000 tons. The payload is set for 18 tons per load.

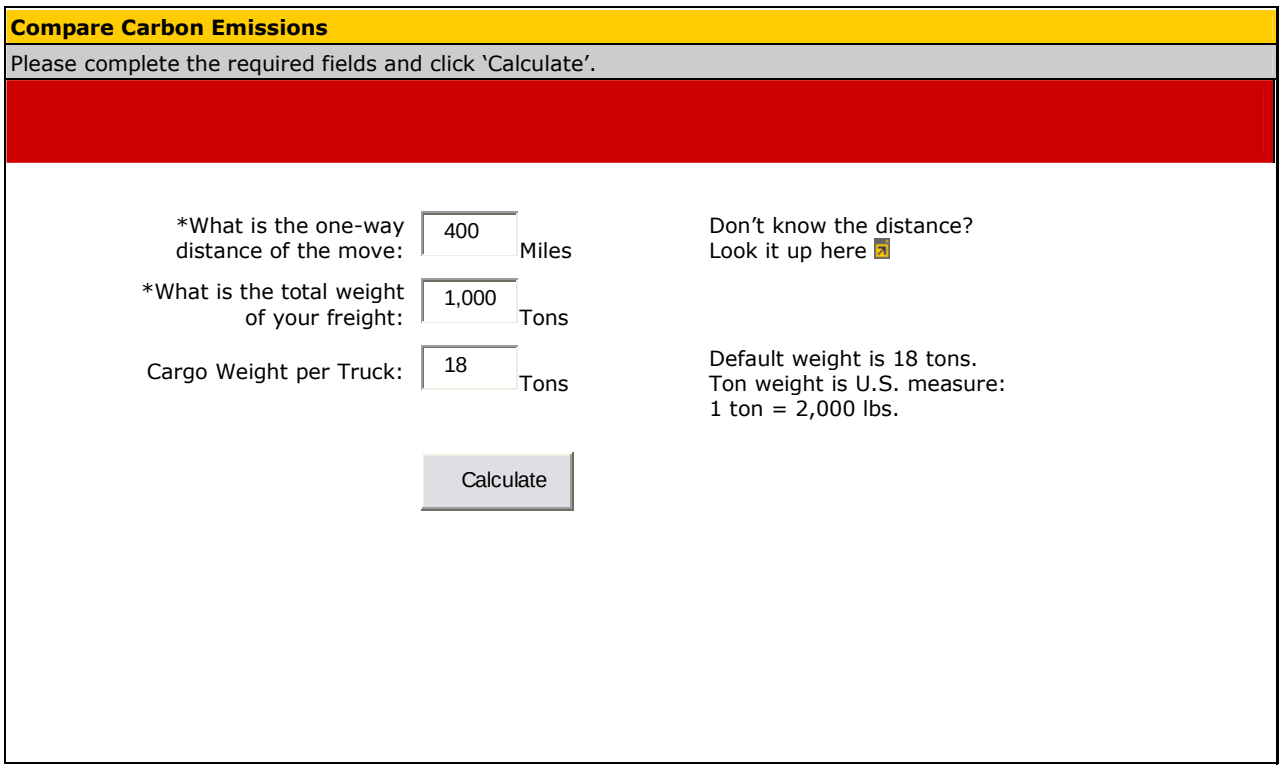


Fig (5)

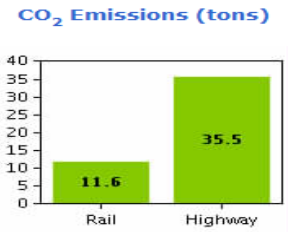
The calculator automatically determines (Fig 6) the number of trucks needed, the number of rail cars needed and the amount of CO^2 emissions released by both modes of transportation. The difference is extremely significant. This also indicates that shipping waste out-of-state to a rail served landfill is still more environmentally friendly than trucking to an in-state disposal facility such as Seneca Meadows, which is about 340 miles from Suffolk County.

Your results:

Total distance: 400 miles
Total freight weight: 1,000 tons
Number trucks needed: 56 truck(s)
Number rail cars needed: 12 rail car(s)

Estimated CO_2 emissions:

Rail: 11.6 tons
Highway: 35.5 tons



Choosing CSX rail reduces your freight carbon emissions by 24 tons.

Your input for this shipment:

One-way mileage: 400 miles
With a total weight of: 1,000 tons
With each truck carrying: 18 tons

Truck Traffic Congestion

The following two charts supplied by CSX show the bridge route capacity as it stands today and the reason for the congestion. New York only ships two percent of its freight by rail. The truck route network is insufficient.

Truck Traffic Creates Congestion at Key Choke Points

Trucks are limited to certain crossings and are major contributors to choke points. The George Washington and Verrazano Bridges handle 30,000 truck crossings a day and are already over capacity.

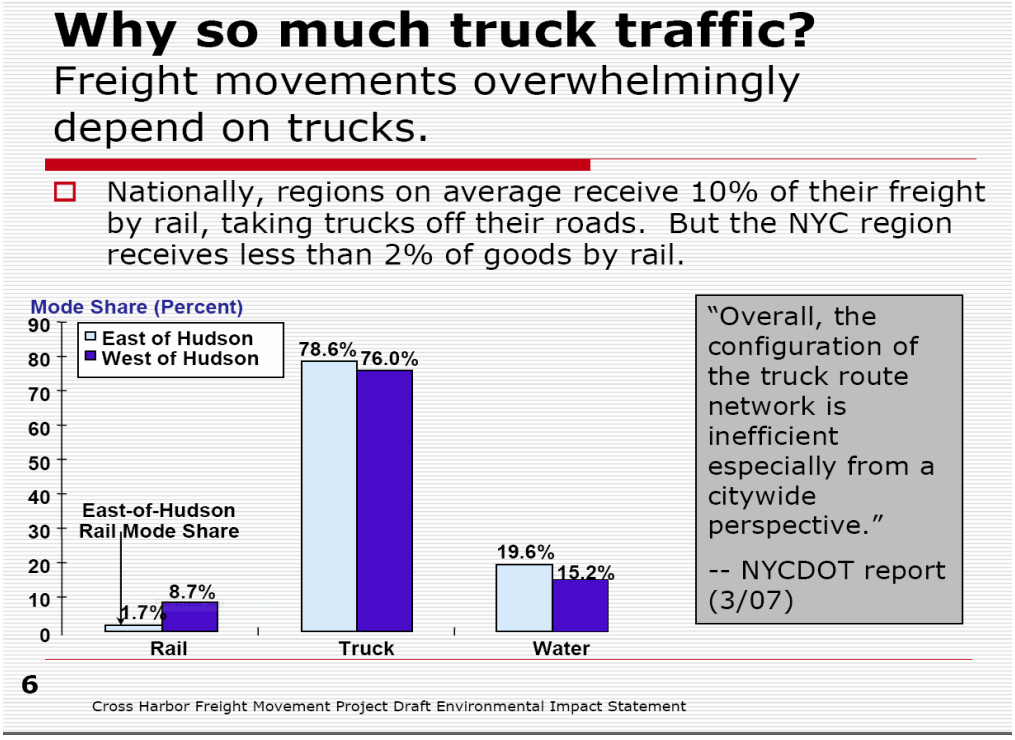
George Washington Bridge

Direction	AM	PM
In lower	AT CAPACITY	SEVERE CONGESTION
In upper	OVER CAPACITY	OVER CAPACITY
Out lower	SEVERE CONGESTION	OVER CAPACITY
Out upper	OVER CAPACITY	OVER CAPACITY

Verrazano-Narrows Bridge

Direction	AM	PM
In lower	OVER CAPACITY	ACCEPTABLE CONGESTION
In upper	OVER CAPACITY	ACCEPTABLE CONGESTION
Out lower	SEVERE CONGESTION	OVER CAPACITY
Out upper	ACCEPTABLE CONGESTION	ACCEPTABLE CONGESTION

11 Congestion Management System 2005 Status Report, New York Metropolitan Transportation Council

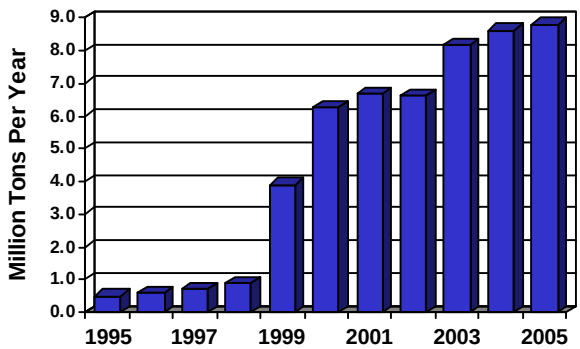


Rail As An Option for Long-Haul

Before making a comparison between trucking and rail for long-hauling waste, we want to determine if rail is a viable alternative.

In North America, freight railroads are operated by private-sector companies.

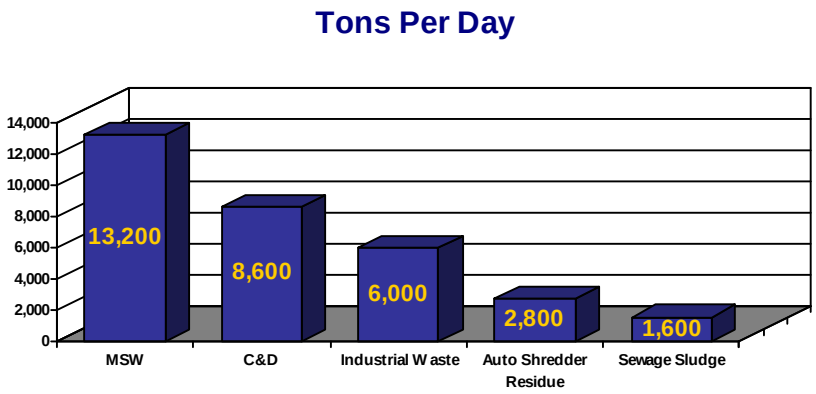
- Eastern U. S. Railroads
  - CSXT
  - Norfolk Southern
- Western U. S. Railroads
  - Union Pacific
  - BNSF
- Canadian Railroads
  - Canadian National
  - Canadian Pacific



Graph (3)

According to CSXT, waste-by-rail is the future. CSXT's growth in waste-by-rail has been tremendous as shown in Graph (3) provided by CSXT. Between 1999 and 2005 there has been a huge increase in shipping waste by rail for CSXT as more and more municipalities seek alternative means of transporting waste.

CSXT already hauls over 30,000 tons per day of different waste material as shown in Graph (4).



Graph (4)

According to CSXT, there is plenty of opportunity for expanding waste-by-rail. Graph (5) shows the general flow of waste by rail provided by CSXT.

Following Is A Typical Waste By Rail Intermodal Operation

Pictures are provided by CSXT.

Waste-by-Rail is a clean and efficient method to transport waste

Waste container dimensions

Length	20 feet
Height	12 feet
Width	8 feet 6 inches
Capacity	62 cubic yards
Tare	4.5 tons
Average Lading	20 tons

A Typical Waste Intermodal Rail Haul Operation

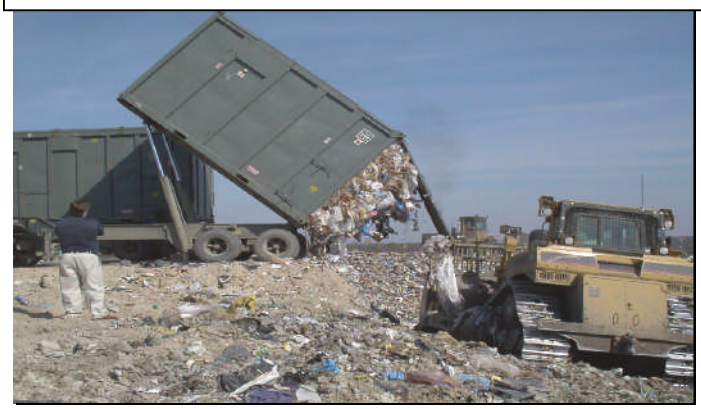
(1) Containers are top loaded and sealed with a steel lid

(2) Containers are loaded onto a double-drop truck chassis

(3) Container handler lifts containers on and off railroad

(4) Four 20ft-containers loaded on each flatcar

(5) Containers are tipped for unloading at the landfill



Cost comparison in implementing a Waste Long Haul Program
In-State long haul and Out-of-State
(Truck v.s. Rail)

We will use a scenario of 1,000 tpd (tons per day) of long hauled from Suffolk County. We will use Apex Sanitary Landfill located in Jefferson County, Ohio for our out-of-state review and Seneca Meadows landfill for our Long Haul In-State review.

Apex Landfill is 628 miles from the western border of Suffolk County. Driving time is 10 hours (no traffic). A payload of 20 tons will be used.

Truck: A three day turn-around time per load will be anticipated for a total of eight loads per month. The truck will not be able to dump on the day it leaves. Legally, a truck driver may not drive more than 10 hours, after having eight straight hours off-duty, or for any period of time at all, after the driver has been on duty for 15 straight hours, after having 8 straight hours off-duty. Also, a motor carrier (trucking company) may not require (or even allow) a truck driver to drive at all after 60 hours in any single week. In a similar vein, a truck driver also may not drive a truck, if he has been driving 70 hours in any 8-day period. You can find these regulations at 49 C.F.R. Section 395.3.

This study will not include equipment necessary to operate a transfer station.

Up-front equipment cost:
Tractors needed: 150 Cost: $15,000,000.00 @ $100,000 per tractor
Trailers needed: 150 Cost: $ 9,000,000.00 @ $ 60,000 per trailer
Total equipment Cost: $ 24,000,000

Rail: A three load per month per rail car scenario will be anticipated. A payload of 20 tons per intermodal container and 80 tons per railcar will be anticipated.

Up-front equipment cost:
Flatbed Railcars needed: 125 Cost: $12,500,000 @ $100,000.00 per railcar
Intermodal Containers: 500 Cost: $ 7,500,000 @ $ 15,000.00 per container
Total equipment cost: $ 20,000,000

The up-front equipment cost for the implementation of transport by rail is substantially cheaper than by truck. A case can be made to shorten the long haul distance for trucks to utilize a landfill that is not rail served. In this case, not as many trucks and trailers would be required. A case can also be made that there are approximately one million tons of available or unused disposal capacity annually in-state.

We will look at Seneca Meadows landfill located in Waterloo, New York, near Seneca Falls. Seneca Meadows just received permits to allow an additional 31 million tons of disposal capacity which will extend the site life of the non-hazardous solid waste management facility to approximately 2023, based on current annual volumes.

Seneca Meadows Landfill (for in-state long haul disposal) is 338 miles from the western border of Suffolk County. Driving time is 6 hrs. (No traffic). A payload of 20 tons will be used. A two day turn around time per load will be anticipated for a total of 12 loads per month.

Up-front equipment cost:

Tractors needed: 100	Cost: $ 10,000,000.00 @ $100,000 per tractor
Trailers needed: 100	Cost: $ 6,000,000.00 @ $ 60,000 per trailer

Total equipment Cost: $ 16,000,000

Drivers needed: 100	Cost: $ 21,000 per day @ $21 per hour
	$ 441,000 per month @ 21 days per month

Summary

Apex Landfill: Implementing a long haul operation Out-of-State by truck is substantially more expensive than by rail right from the start.

Seneca Meadows: Implementing a long haul operation In-State by truck is cheaper than rail out-of-state; or so it would seem. When talking transport by truck, you need just as many drivers. When you take this into consideration, rail is again substantially cheaper. A five person train crew can move as much tonnage as fifty truck drivers under this scenario.

The best long-haul scenario
The best overall scenario would be for Seneca Meadows Landfill to adapt service-by-rail. This would provide the capability of in-state waste disposal, thereby relieving the concern of other states implementing exorbitant waste surcharges, and at the same time take trucks off the road by providing the capability of long hauling waste by rail.

Suffolk County Waste

In this section we will look at what types and amounts of wastes are to be long hauled from Suffolk County.

The C&D Waste stream has no effect on the *long haul* transportation of waste as more C&D is imported into Suffolk County than is exported.

A brief overview of C&D in Suffolk County:

Suffolk County has three C&D end-disposal facilities.

1. 110 Sand & Gravel.
2. Islip landfill.
3. Brookhaven landfill.

Each of the three end-disposal facilities handles three different types of C&D debris

1. 110 Sand & Gravel receives dense C&D debris.
2. Islip receives material over the 12" minus material received at Brookhaven. Islip wants to be able to visually identify any contaminants in the loads. Hence, the desire for bulky debris.
3. Brookhaven receives 12 in minus processed material and 2" minus ADCM (Alternate Daily Cover Material). The focus for Brookhaven is to maximize compaction in the landfill.

Most of the C&D tonnage received at 110 Sand & gravel is imported from transfer stations west of Suffolk County primarily from Brooklyn and Queens. The reason west end C&D transfer stations deliver their tonnage to 110 Sand & Gravel is because city C&D is heavier and denser than C&D generated in Suffolk as there are more concrete structures in the City. Some west end transfer stations pulverize the material but do not screen. The material becomes very dense. 110 Sand & Gravel's tip fee is charged by the yard. It is cheaper for a company disposing heavy material to pay by the yard rather than by the existing per-ton prices charged by Brookhaven and Islip.

Example: Dense C&D material is typically hauled in dump trailer type trucks (Approximately 40 yards) due to the weight of the material. Lighter C&D material will be hauled in 100 to 120 yard Walking Floor type trucks.

The economics associated with the transport of waste with both type trailers:

Any typical waste haul vehicle should generate at a minimum $1,100 per day revenue. A truck hauling from Brooklyn to Brookhaven can make three loads per day. The same truck can make four loads per day by using 110 Sand & Gravel as its end-disposal facility.

1. A 40 yard dump trailer would only be able to transport about 10 tons of *light* material. The average load from Brooklyn pays about $11 per ton. The load would pay the transporter $110 per load (10 tons x $11 per ton). At three loads to Brookhaven the transporter would make $330.00 for the day.
2. The same 40 yd. dump trailer hauling 30 tons of dense material dumping at 110 Sand & Gravel will make $330 per load (30 tons x $11.00 per ton). At four loads per day to 110 Sand & Gravel the transporter would make $1,320.00 for the day. A larger trailer is necessary to haul *light* material to get more tonnage per load to make it economically feasible.

Dense material can be hauled in a 100 yard trailer. However, 100 yards of dense material would put the vehicle grossly overweight and the hydraulics might not be able to pump out the load. Also, a 23 ton load of dense material as ADCM hauled

in a 100 yard walking floor trailer would only fill the trailer half-way. The driver would not be able to reach the top rails of his trailer to tarp his load.

The economics associated with disposal costs with both type trailers:

A 40 yard dump trailer will carry a 30 ton payload of unscreened processed C&D.
A 100 yard walking floor trailer will carry a 23 ton payload of screened processed C&D.
110 Sand & Gravel will charge a $31 *per yard* tip fee.
Brookhaven will charge a $50 *per ton* tip fee.
The charge to dump at 110 Sand & Gravel would be $1,240/40 yards x $31 per yard.

The charge to dump the same load at Brookhaven landfill would be $1,500 / 30 tons x $50 per ton.

There is a $260 per load savings to dump at 110 Sand & Gravel by the yard.
Other determining factors for these transfer stations to dump at 110 Sand & Gravel over Brookhaven are:

Brookhaven is 25 miles further east of 110 Sand & Gravel. A truck hauling from Brooklyn to Brookhaven can make 3 loads per day. The same truck can make 4 loads per day by utilizing 110 Sand & Gravel as its end-disposal facility. This equates to more production per person and per vehicle.

On the other hand, a transfer station that processes and screens its material would use Brookhaven landfill as its end-disposal facility. Processed, screened C&D debris is hauled in 100 yard walking floor type trucks with a payload of 23 tons. The charge to dump at Brookhaven would be $1,150 / 23 tons x $50 per ton. The charge to dump the same load at 110 Sand & Gravel would be $3,100 / 100 yards x $31 per yard, a savings of $1,900. With lighter C&D debris there is a much greater savings to dump at Brookhaven over 110 Sand & gravel.
Islip is a non-factor in attracting C&D debris from outside of Suffolk County as they receive bulkier material. Islip receives processed or unprocessed (lighter) bulkier C&D minus screenings.

Summary of C&D Waste Stream

Any C&D debris imported from outside Suffolk County is either end-disposed in Suffolk or is transported long distance by rail from existing C&D Rail Haul facilities within Suffolk County.

No C&D generated or imported in Suffolk is long hauled outbound by truck. C&D does not affect the issue of long haul transportation of waste from Suffolk County.

MSW STREAM LONG HAULED

Figure (A) gives us an idea of the amount of waste, residential as well as commercial, long hauled out of Suffolk County on a daily basis. Figure (A) also gives us the number of trucks and rail cars needed to move the waste.

Suffolk County Waste Report					
	Residential Tons	Local Disposal	Long Haul	Commercial Tons Long Haul	
Babylon	114,000	114,000			
Brookhaven	225,000	200,000	25,000		
East Hampton	7,000		7,000		
Huntington	107,000	107,000			
Islip	176,000	159,000	17,000		
Riverhead	7,000		7,000		
Shelter Island	5,000		5,000		
Southampton	8,000		8,000		
Smithtown	60,000	60,000			
Southold	9,000		9,000		
Annual	718,000	640,000	78,000	308,034	
Tons per day / 5 days	2,762	2,462	300	1,185	
Total tons long hauled residential + commercial ANNUAL:		386,034			
Total tons long hauled residential + commercial DAILY:		1,485			
260 days per year on a five day week			Residential Loads	Commercial Loads	Total trucks
Long Haul Trucks - Walking Floors & Flatbeds per day @ 23 tons per load			13	52	65
one load = 40 ton / 23 ton pay load + 34 truck and trailer tons					
65 tractor trailer loads of waste can be shipped in only 16 rail cars					
16 rail cars of waste = 65 trucks = 2,582 tons per day off the road daily					
16 rail cars of waste = 387 less cars per day off our roadways					
A 5 person train crew can move the same tonnage as 65 truck drivers					

Fig. (A)

Case Study

We will now look at a comparison between the two on-land methods of transporting waste: truck vs. rail. We will look at a case study comparison from a facility located in Suffolk County.

Before reviewing the case study, I want to point out that this analysis was done with C&D debris being the product for long haul disposal as opposed to residential or commercial. The comparison is still accurate as the focus is on transportation. Tip fees for the different waste streams are not considered.

Case Study – supplied by NY & Atlantic Rail
NYA Farmingdale Facility

- Estimates made by independent engineer expert in waste management
- Move 420,000 tons per year of C & D
- Farmingdale to Ohio landfill
- 100 tons per rail car vs. 20 tons per truck
  4,200 rail cars vs. 21,000 trucks per year
- 240 – 280 trains vs. 21,000 truck trips

Direct Cost to Move Freight

- $1,500 - $3,000 per rail car
  - » **$15 - $ 30 per ton rail**
- $1,200 - $1,600 per truck
  - » **$60 - $ 80 per ton truck**

Fuel Consumption

Gallons of Diesel Fuel Per Year

Rail	Truck
1.3 million	4.1 million

Air Pollutions Impacts

	Annual Rail Emissions (tons per year)	Annual Truck Emissions (tons per year)	**Truck Divided by Rail**
Carbon Monoxide	18	71	**4.0x**
Nitrogen Oxides (Nox)	120	441	**3.7x**
Volatile Organic Compounds	6.6	9.5	**1.4x**
PM10	4.2	11.5	**2.8x**
PM2.5	4.2	9.9	**2.4x**
Carbon Dioxide	14,010	42,865	**3.1x**

Accident Costs

Total	**$1.6 million**	**$21.9 million**
Cost Per Ton	**$3.82**	**$52.20**

There are also other significant societal costs associated with long-haul trucking that are not associated with rail transport or are associated at a lesser degree. These societal costs are not easily quantifiable but include:

- wear and tear of roads and bridges and other municipal infrastructure
- congestion costs to quality of life and economic growth
- air pollution and health effects and societal costs
- noise pollution and related quality of life concerns.

Summary of Farmingdale Study

	Rail	Truck
Direct Cost ($/ton)	$15 - 30	$60 - 80
Fuel Consumption (gallon's per year)	1.3 million	4.1 million
Societal Costs ($/ton)	$3.82	$52.20
Air Pollution	63 - 72 % less with rail	

Overall Summary of Report:

If waste is going to continue in large part to be processed off Long Island, then we must find a more efficient means of transporting our mountain of waste each year to distant locations. The benefits of rail transport over trucking are clear from both an economic and social perspective. However, there are still logistical hurdles such as a single set of train tracks, commuter rail scheduling conflicts, and inefficient rail routes. There may also be public concerns relating new rail spurs and the conversion of rail yards into waste transfer locations. Nonetheless, regulators must play a helpful role in clearing the way for a future that reduces reliance on long-haul trucking and shifts to a more economic and environmentally friendly approach such as rail transportation.

The NY Area Must Change the Way it Moves Freight

Efficiency of Freight Railroads vs. Trucks

Mode	Fuel Consumption	Infrastructure Capacity[1]	Cost[2]	Safety[3]
Railroad	455 ton-miles per gallon	216 million annual tons per track	2.7¢ per ton-mile	0.61 fatalities per billion ton-miles 12.4 incidents[4] per billion ton-miles
Truck	105 ton-miles per gallon	37.8 million annual tons per lane	5.0¢ per ton-mile	1.45 fatalities per billion ton-miles 36.4 injuries per billion ton-miles

12 Cross Harbor Freight Movement Project
Draft Environmental Impact Statement

1 Theoretical capacity calculation assuming maximum density freight use
2 Based on latest available AAR and ATA national revenue and volume
3 Based on 2001 FMCSA and AAR safety statistics
4 "Incidents" include all non-fatal injuries and property damage accidents

Factors Pushing Waste to Rail

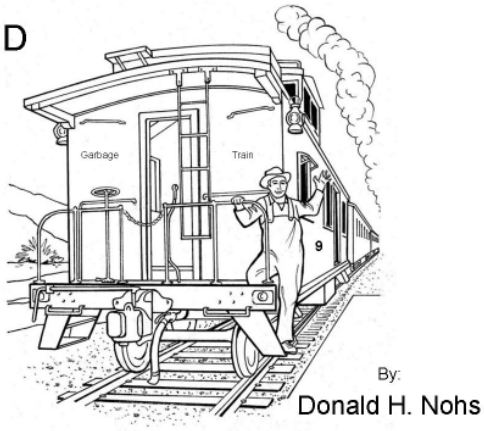
- Landfills are located farther away.
- Railroads are cheaper for long haul traffic.
- Difficult to get long haul truckers to come to Long Island.
- Health and safety
- More landfills are adding rail accessibility
- It is cheaper to redirect rail than truck to alternate landfills

Benefits of Waste-By-Rail Program

- ✓ Cost savings (transportation and disposal) About ½ the cost
- ✓ Expands disposal options
- ✓ Reduces traffic congestion
- ✓ Enhanced safety
- ✓ Improves the environment
- ✓ Reduces reliance on trucks
- ✓ Optimizes disposal facility network
- ✓ Loading and unloading efficiencies
- ✓ Per ton-mile, a truck emits 3x to 4x more NOx and particulates than rail
- ✓ Rail is 3X to 4X more fuel efficient than trucking, reducing transportation greenhouse gases.
- ✓ About six times the capacity
- ✓ Less than ½ the number of fatalities
- ✓ Lower energy consumption by rail
- ✓ Lower pollution emissions by rail
- ✓ Lower external or societal costs
    - Pavement wear and damage
    - Bridge wear and tear
    - Highway congestion
    - Highway accidents

Benefits of Waste-By-Rail Program

END



Examining Alternative Technologies and Their Application to Waste Management Practices in Suffolk County

Prepared by: **Sub-Committee on New Technologies**
Jay H. Schneiderman, Chairman

Introduction

Most of the discussion on solid waste management has thus far focused on more efficient ways of transporting waste to landfills in other states where this disposal practice is permitted, as well as expanding Long Island's capacity to convert waste to energy through existing facilities. However, there are several emerging technologies that may provide cost-effective and environmentally safe alternatives to current methods. These technologies vary in cost, methodology, emissions, energy consumption, and by-products. Some are more theoretical, while others are in operation. Some require significant quantities of waste before becoming cost-effective, and others need large capital expenditures to construct. Regardless, each technology raises a different set of community concerns including traffic, noise, and air quality.

Long Island's large volume of household refuse (3.81 pounds of municipal solid waste per person per day) puts Suffolk in a strong position to attract companies willing to invest in better ways to process waste. The benefits of processing municipal solid waste (MSW) on Long Island include:

- Job creation
- Decreased traffic through transportation
- Cost savings over current practices
- Lowering energy prices by increasing supply
- Keeping money in Suffolk's economy rather than paying out-of-state tipping fees
- Environmental benefits over burying waste in landfills

The Regional Solid Waste Management Commission evaluated eight technologies for their viability in Suffolk. These are: anaerobic digestion, biomass gasification, direct melting system, high-pressure steam/autoclave, plasma ach technology, pyrolysis, thermal deplolymerization, and waste-to-energy/mass burn. For each technology, a short description is presented, along with existing operations, as well as the advantages and limitations associated with it. At this section's conclusion, regulatory and permitting issues are also discussed.

Waste-Processing Technologies

Anaerobic Digestion

Description

Anaerobic digestion is a process in which microorganisms break down biodegradable material in the absence of oxygen. It is a biological process that produces a gas principally composed of methane (CH_4) and carbon dioxide (CO_2) and otherwise known as "biogas." These gases are produced from organic wastes such as livestock manure, food processing waste, etc.

Anaerobic processes could either occur naturally or in a controlled environment such as a biogas plant. Organic waste such as livestock manure and various types of bacteria are put in an airtight container called a digester so the process can occur. Depending on the waste feedstock and the system design, biogas is typically 55 to 75 percent pure methane. State-of-the-art systems report producing biogas that is more than 95 percent pure methane.

The process of anaerobic digestion consists of three steps. The first step is the decomposition (hydrolysis) of plant or animal matter. This step breaks down the organic material to usable-sized molecules such as sugar. The second step is the conversion of decomposed matter to organic acids. And finally, the acids are converted to methane gas.

Process temperature affects the rate of digestion and should be maintained in the mesophilic range (95 to 105 °F) with an optimum of 100 °F. It is possible to operate in the thermophilic range (135 to 145 °F), but the digestion process is subject to upset if not closely monitored.

Advantages

Most anaerobic digestion technologies are commercially available. Where unprocessed wastes cause odor and water pollution (such as in large dairies), anaerobic digestion reduces the odor and liquid waste disposal problems and produces a biogas fuel that can be used for process heating and/or electricity generation. Other benefits include:

- Reduction or elimination of flies;
- A relatively clean liquid for flushing and irrigation can be produced;
- Pathogens are substantially reduced in the liquid and solid products;
- Greenhouse gas emissions are reduced;
- On farm power production; and
- Nonpoint source pollution is substantially reduced.

Disadvantages

- It is a slower process than aerobic digestion.
- It is more sensitive to upsets by toxicants.
- Start-up of the process requires long periods of time.

Current usage

Many anaerobic digestion technologies are commercially available and have been demonstrated for use with agricultural wastes and for treating municipal and industrial wastewater. A growing number of larger-scale dairies are using anaerobic digestion of manure to reduce odors and produce biogas to be used as a fuel for heating and/or electricity generation.

At Royal Farms No. 1 in Tulare, California, hog manure is slurried and sent to a Hypalon-covered lagoon for biogas generation. The collected biogas fuels a 70 kilowatt (kW) engine-generator and a 100 kW engine-generator. Other swine farms (Sharp Ranch, Fresno and Prison Farm) have also installed floating covers on lagoons. The Knudsen and Sons project in Chico, California treated wastewater which contained organic matter from fruit crushing and wash down in a covered and lined lagoon. The biogas produce is burned in a boiler. And at Langerwerf Dairy in Durham, California, cow manure is scraped and fed into a plug flow digester. The biogas produced is used to fire an 85 kW gas engine. The engine operates at a 35 kW capacity level and drives a generator to produce electricity. The system has been in operation since 1982.

Sources
California Energy Commission
www.energy.ca.gov / development / biomass / anaerobic

Biomass Gasification

Description

Biomass is a renewable energy source such as organic material made from plants and animals. Biomass contains stored energy from the sun. Plants absorb the sun's energy in a process called photosynthesis. The chemical energy in plants gets passed on to animals and people that eat them. Some examples of biomass fuels are wood, crops, manure, and some garbage. It excludes organic material that has been transformed by geological processes into substances such as coal or petroleum.

Biomass is heated with no oxygen—or only about one-third of the oxygen needed for efficient combustion—until it gasifies into a mixture of carbon

monoxide and hydrogen. The result is synthesis gas or syngas. Biomass gasification involves thermally converting biomass to simple chemical building blocks that can be transformed to fuels, products, power and hydrogen. Components include feed preparation, the biomass gasifier, and a gas treatment and cleaning train. The initial syngas contains particulates and other contaminants and must be cleaned and conditioned prior to use in fuels, chemical, or power conversion systems (e.g. catalyst beds, or fuel cells).

Advantages

Combustion is a function of the mixture of oxygen with the hydrocarbon fuel. Gaseous fuels mix with oxygen more easily than liquid fuels, which in turn mix more easily than solid fuels. Syngas, therefore, burns more efficiently and cleanly than the solid biomass from which it was made. Biomass gasification can thus improves the efficiency of large-scale biomass power facilities such as those for forest industry residues and specialized facilities such as black liquor recovery boilers of the pulp and paper industry. Both are major sources of biomass power. Like natural gas, syngas can also be burned in gas turbines.

Current usage

Biomass gasification technologies have been a subject of commercial interest for several decades. Interest in biomass gasification increased substantially in the 1970s because of uncertainties in petroleum supplies, with most of the development occurring in small-scale systems. Low-energy gasifiers are now commercially available, and dozens of small-scale facilities are in operation.

In the 1980s, government and private industry sponsored R&D for gasifier systems primarily to gain a better understanding of reaction chemistry and scale-up issues. In the 1990s combined heat and power was identified as a potential near-term opportunity for biomass gasification because of incentives and favorable power market drivers. R&D concentrated on integrated gasification combined cycle (IGCC) and gasification co-firing demonstrations, which culminated in a number of commercial-scale systems. In the U.S., projects mostly processed very recalcitrant feeds such as bagasse and alfalfa.

Sources

US Department of Energy, Energy Efficiency and Renewable Energy, “Biomass Program.” http://www1.eere.energy.gov/biomass/gasification.html
http://en.wikipedia.org/wiki/Biomass

Direct Melting System (DMS)

Description

The melting furnace is a simple shaft furnace, which accomplishes both gasification and melting in a single furnace. Diverse types of waste are introduced into the top of the furnace with a small amount of coke and limestone. The waste gradually drops to the bottom of the unit while drying (in the drying and pre-heating zones), organic components are thermally decomposed and gasified (in the thermal decomposition and gasification zones), and ash and inorganic components are melted (in the combustion and melting zones) to produce high-quality slag and metal resources.

The gas generated from thermal decomposition in the melting furnace is completely combusted in an independent chamber and controlled to suppress the generation of toxic gases. This gas is subject to optimized exhaust gas processing with an exhaust gas temperature controller and bag filter to ensure that levels of dioxins are strictly within the various environmental standards.

Waste products suitable for this technology are Combustible refuse, Non-combustible waste, Incinerator residue, Fluorocarbons, Industrial waste (shredder residue, etc), Landfilled waste.

Advantages

- Usable with a wide range of materials. Combustible and non-combustible waste, sludge, incinerator residue, fluorocarbons, industrial waste products (e.g. shredder dust), waste from landfills.
- All slag and metal recovered is of high quality and is consigned to the valuable metals market.
- Generation of dioxins controlled to the minimum.
- Flexibility in consuming combustible and non-combustible wastes—incombustible portion of waste is converted into reusable slag and metal.
- Combustible wastes are gasified and combusted in an independent chamber without dioxin formation.
- Waste heat recovery from process off-gas provides power generating/heating capability.
- Exhaust gas is clean and final ash disposal volume is considerable reduced.

Therefore, system can reduce final disposal volume of waste and minimize environmental load.

Current Usage

Japan (especially the Nippon Steel Corporation, which has the largest number of operating units in the world). List of facilities at http://kankyou.eng.nsc.co.jp/jisseki_pdf/results.pdf

Sources

VAMS, "NSC Direct Melting System (DMS) PowerPoint Presentation, delivered in March 2006.

"Nippon Steel Licenses Waste Gasification & Melting Furnace Project to the Republic of Korea," JCN *Newswire*, Jan 23, 2004
http://www.japancorp.net/Article.Asp?Art_ID=6348
"Direct melting system for recycling (shaft furnace-type gasification and melting furnace)" http://www.nedo3r.com/TechSheet/JP-0199E.htm

High-pressure Steam Autoclave

Description

A French scientist invented the high-pressure steam autoclave in 1879 to sterilize and disinfect medical instruments. Such autoclaves are now commonly used in healthcare, laboratories, and commercial food preparation. A waste autoclave is a form of solid waste treatment that uses heat, steam and pressure of an industrial autoclave in the processing of waste. Waste autoclaves process waste in batches. Saturated steam is pumped into the unit at temperatures around 160°C. The pressure in the vessel is maintained at 5 bar gauge for a period of up to 45 minutes to allow the process to fully "cook" the waste. The autoclave process gives a very high pathogen and virus kill.

The process causes plastics to soften and flatten, paper and other fibrous material to disintegrate into a fibrous mass and bottles and metal objects to be cleaned and labels etc to be removed. The process reduces the volume of the waste by approximately 60 percent. The steam flow is then stopped and the pressure vented via a condenser. When depressurized, the autoclave door is opened, and by rotating the drum the 'cooked' material can be discharged and separated by a series of screens and recovery systems.

The full process of loading, treatment, and sorting is normally completed within 90 minutes in earlier models, and with the advent of newer technology, the cycle time has been decreased to one hour. In a typical new configuration, two 10-ton units operating side by side would treat over 400 tons per day with time for preventative maintenance.

Current usage

At present, most of the commercially operated autoclaves are used to treat regulated medical waste. Newly developing markets are pushing a number of firms to offer rotating MSW autoclave technologies, but, only three firms in the world have demonstrated commercial scale operations.

Estech Europe (www.estechusallc.com) currently has contracts in place and is constructing three complete Fibrecycle processing plants at sites across the United Kingdom, and is breaking ground for two additional locations.

Advantages

- A closed looped system that efficiently captures volatile organic compounds with no impact on air quality
- Reduction in waste volume which reduces landfill disposal
- Does not include waste incineration
- Residue remaining is sterile and inert
- 100 percent recycling participation of residential and business customers
- 80-90 percent of MSW is recovered and sold as recyclable materials
- Dry cellulose fiber has many beneficial uses such as a solid fuel

Disadvantages

- Residual wastes needs to be landfilled.

Sources

1. Wikipedia, “Waste autoclave,” http://en.wikipedia.org/wiki/Waste_autoclave
2. Based on presentation to the Suffolk County Legislature’s Committee on Public Works and Transportation, 2007.
3. Estech USA, http://www.estechusallc.com/

Plasma Arc Technology

Description

A plasma arc operates on principles similar to an arc-welding machine, where an electrical arc is struck between two electrodes. The plasma converter is an electrochemical system powered by electrical-chemical system powered by electricity that produce an intense field of radiant energy (plasma) that causes the dissociation of waste materials into elemental atoms. The high-energy arc

creates a high temperature (sometimes in excess of 30,000 deg. F) and highly ionized gas. The plasma arc is enclosed in a chamber.

Waste material is fed into the chamber and at such temperatures all materials that come into contact with the arc disassociate from their compound form, back to their elemental form, which at the end of the process, produces synthetic gaseous fuels that can be used to produce steam or electricity. The disassociation process creates two products: molten slag (sometimes called obsidianite) and the plasma converter gas (also known as syngas). The process also has the potential to produce liquid fuels such as synthetic diesel (e.g., Ethanol). There is no combustion in this process.

The technology internally controls any formation of unwanted materials, and returns these materials back to the arc for disassociation. The inorganic components of the feed are converted to molten slag, which is removed as vitrified byproduct. The inorganic portion of the waste is retained in a stable, leach-resistant slag. Combustible gas is cleaned in the off-gas system and oxidized to CO_2 and H_2O in ceramic bed oxidizers. The potential for air pollution is low due to the use of electrical heating in the absence of free oxygen.

Additionally, advocates of the technology believe hydrogen gas production is another possible end point in this process. With the advent of the hydrogen fuel cell, production of hydrogen will be necessary to kick start the use of this “environmentally friendly” fuel, one with a zero carbon footprint.

Applicability

The plasma arc can be used for organic and inorganic wastes. It is being studied for mixed radioactive waste treatment, because it separates the organic from the inorganic portion of the waste. It is also being studied to reduce explosive compounds and unexploded ordnance in place of traditional technologies, such as open burning and open detonation that produced toxic emissions and hazardous ash.

Technology Development Status

Plasma arc systems are developed and commercial applications exist for both hazardous and radioactive waste.

Some locations where currently in use:

At the Hawthorne Ammunition Depot, Nevada, site of the U.S. military’s largest munitions demilitarization stockpile, the Army is undertaking the large-scale demilitarization of small caliber pyrotechnic ordnance using a new technology,

plasma arc thermal treatment. Montana-based MSE-Technology's Plasma Ordnance Demilitarization System (PODS) uses electrically power plasma arc torches to deliver heat up to 20,000 degrees Fahrenheit, destroying the ordnance by maintaining the waste residue in a molten bath of at least 3,000 degrees.

A $425 million facility expected to be built in St. Lucie County will use plasma arcs to turn trash into gas and rock-like material. It will be the first such plant in the nation operating on such a massive scale and the largest in the world. Synthetic, combustible gas produced in the process will be used to run turbines to create about 120 megawatts of electricity that will be sold back to the grid. The facility will operate on about a third of the power it generates, free from outside electricity [1]. The current status of this project is unknown.

Advantages

- Offers a single-step treatment for a variety of waste streams, both small and large.
- Media amenable to treatment includes soil, sludge, ash, solids, pastes, and liquids from industrial processing operations. [2]
- Requires minimal waste pretreatment.
- Achieves destruction and removal efficiencies in excess of the U.S. Environmental Protection Agency requirement of 99.99 percent. It converts organic materials into simple gaseous compounds that can be easily scrubbed and rendered harmless, and stabilizes toxic wastes in a leach-resistant, vitrified slag that is suitable for landfill deposition.
- Is efficient in treating process by-products including fly ash and scrubber residues.
- Offers several safety advantages in comparison to conventional incineration processes.
- Provides volume reduction of the waste streams, ranging from 67-99 percent, depending on the composition of the waste stream. Corresponding benefits include reduced storage, handling, and shipping costs, in addition to providing increased life to landfills since less waste will be dumped into landfills.
- A closed looped system that efficiently captures volatile organic compounds with limited impact on air quality.
- No green house gas emission.
- Convert the waste material to useful products such as syngas for production of steam or electricity.
- Hydrogen gas production is another possible end point in this process.
- The obsidianite is a valuable commodity with applications in the construction, building products and abrasives industries.

Disadvantages

- A chief concern about plasma arc technology is ensuring that gaseous emissions are kept to a minimum and cleaned before being released to the atmosphere;
- Still in research stage.
- Substantial initial investment in equipment and staff training.
- Concerns have been raised regarding the reliability of plasma torch technology. The water-cooled copper torch must be replaced periodically to prevent burn-through at the attachment point of the arc and a subsequent steam explosion due to rapid heating of the released cooling water.

Sources
Plasma Arc Technology, "Plasma Arc Technology," http://www.cpeo.org/techtree/ttdescript/plarctech.htm

[1] http://www.usatoday.com/news/nation/2006-09-09-fla-county-trash_x.htm
[2] http://p2library.nfesc.navy.mil/P2_Opportunity_Handbook/2_II_10.html

Pyrolysis

Description

Pyrolysis is a form of incineration that chemically decomposes organic materials by applying heat in the absence of oxygen. Pyrolysis typically occurs under pressure and at operating temperatures above 430 °C (800 °F). In practice, it is not possible to achieve a completely oxygen-free atmosphere. Because some oxygen is present in any pyrolysis system, a small amount of oxidation occurs. If volatile or semi-volatile materials are present in the waste, thermal desorption will also occur.

Organic materials are transformed into gases, small quantities of liquid, and a solid residue containing carbon and ash. The off-gases may also be treated in a secondary thermal oxidation unit. Particulate removal equipment is also required. Several types of pyrolysis units are available, including the rotary kiln, rotary hearth furnace, or fluidized bed furnace. These units are similar to incinerators except that they operate at lower temperatures and with less air supply.

The pyrolysis process produces a liquid residue and gaseous output, which may be combusted to generate electricity. Low temperature pyrolysis can also be used to produce a synthetic diesel fuel from waste film plastic, through systems such as Thermofuel. A solid slag is also produced which may require disposal or additional processing.

An example is the conversion of agricultural waste into bio-oil, using mobile pyrolyzer technology from Agri-Therm. The agricultural waste is pyrolyzed at a temperature of 450 to 550 ºC.

Another example is the conversion of sawdust or waste wood into bio-oil for the production of electricity or syngas, using a stationary fluidized bed pyrolyzer from Dynamotive Energy Systems Corporation. Dynamotive has biofuel plants in West Lorne, Ontario and Guelph, Ontario.

Current usage

There are more than 150 companies around the world that are marketing systems based on pyrolysis and gasification concepts for waste treatment. Many of these are optimized for specific wastes or particular scales of operation. They vary widely in the extent to which they are proven.

Advantages

- Closed system with no emissions
- Efficient electricity generation through combustion of gas through engines
- May qualify for carbon reduction credits
- Potential to recycle a large proportion of residues depending on the process
- Smaller units more acceptable and part of an integrated system

Disadvantages

- May require pre-treatment to be able to handle MSW
- Many processes will still have residues to be disposed of, some of which (from flue gas treatment) will be hazardous in nature
- Limited commercial use for MSW
- More sensitive system than moving grate incineration technology
- More expensive (in terms of tipping fee) than Energy from Waste

Sources

Wikipeida, “Pyrolysis,” http://en.wikipedia.org/wiki/Pyrolysis
The Center for Public Environmental Oversight (CPEO), “Pyrolysis,” http://www.cpeo.org/techtree/ttdescript/pyrols.htm
Shinogi, Y., “Pyrolysis as a Waste Technology: Perspective and Issues,” *Waste Management in Japan*, University of Nagoya, Japan 2004
Juniper is a specialist technology and business consultancy providing support to private and public sector clients in the waste, environmental and renewable energy sectors.
http://www.juniper.co.uk/services/Our_services/P&GFactsheet.html

Thermal Depolymerization

Description

Thermal depolymerization (TDP) is a process for the reduction of complex organic materials (usually waste products of various sorts, often known as biomass and plastic) into light crude oil. It mimics the natural geological processes thought to be involved in the production of fossil fuels. Under pressure and heat, long chain polymers of hydrogen, oxygen, and carbon decompose into short-chain petroleum hydrocarbons with a maximum length of around 18 carbons.

Thermal depolymerization can change many carbon-based materials into crude oil and methane, and is not limited to manure or vegetable waste.

The feedstock material is first ground into small chunks, and mixed with water if it is especially dry. It is then fed into a reaction chamber where it is heated to around 250 °C and subjected to 600 psi (4 MPa) for approximately 15 minutes, after which the pressure is rapidly released to boil off most of the water. The result is a mix of crude hydrocarbons and solid minerals, which are separated out. The hydrocarbons are sent to a second-stage reactor where they are heated to 500 °C, further breaking down the longer chains, and the resulting mix of hydrocarbons is then distilled in a manner similar to conventional oil refining.

Current usage

A thermal depolymerization demonstration plant was completed in 1999 in Philadelphia by Thermal Depolymerization, LLC, and the first full-scale commercial plant was constructed in Carthage, Missouri, about 100 yards (100 m) from ConAgra Foods's Butterball turkey plant, where it is expected to process about 200 tons of turkey waste into 500 barrels (21,000 US gallons or 80 m^3) of oil per day. A federal subsidy (the Energy Policy Act of 2005) allowed a profit of $4/barrel of ouput oil.

The company has explored expansion in California, Pennsylvania, and Virginia, and is presently examining projects in Europe, where animal products cannot be used as cattle feed. TDP is also being considered as an alternative means for sewage treatment in the United States.

Advantages and Limitations

The process can break down organic poisons, due to breaking chemical bonds and destroying the molecular shape needed for the poison's activity. It is highly effective at killing pathogens, including prions. It can also safely remove heavy

metals from the samples by converting them from their ionized or organometallic forms to their stable oxides which can be safely separated from the other products.

However, among the limitations is that the process only breaks long molecular chains into shorter ones, so small molecules such as carbon dioxide or methane cannot be converted to oil through this process. Neither can thermal depolymerization be used to remove radioactivity from radioactive waste.

In addition, many agricultural and animal wastes could be processed, but many of these are already used as fertilizer, animal feed, and, in some cases, as feedstocks for paper mills or as boiler fuel.

Sources

Wikipedia, "Thermal Depolymerization,"
http://en.wikipedia.org/wiki/Thermal_depolymerization
Kantor, Andrew (2004-01-23). Killing germs, reducing waste, making oil: TDP might be the next big thing. *USA Today*.
Kansas City Star, April 12, 2005. The Kansas City Star website has since archived this article: Kansas City: Search results
Circuit court of Jasper County, Missouri, at Carthage

Waste-to-Energy Combustion/Incineration

Description

To reduce waste volume, local governments or private operators can implement a controlled burning process called Energy-from-Waste combustion or incineration. In addition to reducing volume, combustors convert water into steam to generate electricity or for industrial use. These facilities can also remove materials for recycling.

Over one-fifth of the U.S. municipal solid waste combustions use refuse derived fuel (RDF). In contrast to mass burning—where the municipal solid waste is introduced "as is" into the combustion chamber—RDF facilities are equipped to recover recyclables (e.g., metals, cans, glass) first, and then shred the combustible fraction into fluff for combustion.

A variety of pollution control technologies significantly reduce the gases emitted into the air, including:

- Combustion Controls – to destroy organics
- Urea or Ammonia Injection – to control NOx emissions
- Carbon Injection – to remove mercury emissions
- Scrubbers – devices that use a liquid spray to neutralize acid gases
- Fabric filters – remove very tiny ash particles

Burning waste at extremely high temperatures destroys chemical compounds and disease-causing bacteria. Regular emissions testing ensures that these facilities are properly maintained and performing properly. About ten percent of the total ash formed in the combustion process is used for beneficial use such as daily cover in landfills and road construction.

Energy-from-Waste incinerators are commercially proven in that today there are 89 facilities in the United States disposing of about 29 million tons of waste per year while producing about 17 million megawatt hours.

Long Island's four Energy-from-Waste plants utilize conventional mass burn technology where separation of waste occurs primarily at businesses and residences. Refuse is delivered by packer trucks and transfer trailers to an enclosed tipping hall; air in the tipping hall is used for combustion air, thereby significantly reducing odors. The only front-end separation at the plants occurs during truck inspections and whenever crane operators can observe bulky materials. These plants are equipped with semi-dry scrubbers and fabric filter bag houses. Electricity that is produced is delivered to the local electric grid.

The following table presents Long Island Energy-from-Waste historical disposal rates:

Long Island WTE Solid Waste Processing Rate					
Year	**Hempstead**	**Babylon**	**Islip**	**Huntington**	
02	913,005	215,601	152,448	324,367	
03	917,669	224,253	157,421	322,921	
04	930,610	215,276	143,476	318,637	
05	946,404	226,810	162,109	324,011	
06	946,288	228,273	171,157	327,036	
Average	930,795	222,043	157,322	323,394	1,633,554

Taking into account the data presented in the two tables above and knowing the post recycling disposal volume of 2.7 million tons per year allows us to evaluate on-island and off-island disposal, as follows:

Disposal Characteristics for Long Island Waste		
% Five year average WTE Solid Waste Processing Rate	1.6 MM tpy	%
Post recycling Long Island Off Island Disposal	1.1 MM tpy	40.5

Energy-from-Waste has earned distinction through the U.S. Environmental Protection Agency's solid waste management hierarchy, which recognizes combustion with energy recovery (as they refer to Energy-from-Waste) as preferable to landfilling. EPA recommends that *after* efforts are made to reduce, reuse, and recycle, waste should be sent to Waste-to-

Energy plants where the volume of trash will be reduced by 90%, the energy content of the waste will be recovered, and clean renewable electricity will be generated. EPA's hierarchy reflects what EPA has stated previously – that the nation's Energy-from-Waste plants produce electricity with *"less environmental impact than almost any other source of electricity."*

Source: U.S. Environmental Protection Agency

Municipal solid waste must be managed using an integrated waste management system. Communities that use Energy-from-Waste plants recycle nearly 20 percent more than communities that do not have Energy-from-Waste plants. In addition, the nation's Energy-from-Waste plants recycle more than 700,000 tons of ferrous metals per year – enough to manufacture more than a half million new cars. Another positive attribute is that for each ton of waste which is combusted versus long-hauled to a landfill, up to one ton of GHG, measured as CO_2, is eliminated.

The New York State Department of Environmental Conservation offers the following regarding Energy-from-Waste and Greenhouse Gases at www.dec.ny.gov/energy/8979.html:

"The use of waste-to-energy technology prevents the release of forty million metric tons of greenhouse gases in the form of carbon dioxide equivalents that otherwise would be released into the atmosphere on an annual basis, according to an analysis developed by the U.S. Environmental Protection Agency and the Integrated Waste Services Association (IWSA) using EPA's Decision Support Tool program. Annual reporting by IWSA to the U.S. Department of Energy's Voluntary Reporting of Greenhouse Gases Program confirms that waste-to-energy also prevents the release each year of nearly 24,000 tons of nitrogen oxides and 2.6 million tons of volatile organic compounds from entering the atmosphere.

"America's waste-to-energy facilities dispose of trash, and are an alternative to land disposal that releases methane (a potent greenhouse gas) as trash decomposes. Waste-to-energy also produces electricity, lessening reliance on fossil fuel power plants that release carbon dioxide, another greenhouse gas, into the atmosphere when coal or oil are burned. Operation of waste-to-energy plants avoid the release of methane that otherwise would be emitted when trash decomposes, and the release of CO_2 that would be emitted from generating electricity from fossil fuels.

“In addition to the analysis using EPA's Decision Support Tool, and eight years of reporting by the IWSA to the U.S. Department of Energy, a detailed, project analysis of a facility's contribution to solving the threat of global warming has been completed for a 1500-ton-per-day waste-to-energy facility in the northeast. Researchers used information regarding alternative landfill disposal, plant emissions, trash composition and other plant-specific data and analyzed the information using the EPA Decision Support Tool. The study determined that about 270,000 tons of carbon dioxide equivalent emissions are avoided annually because of this one plant's operations. Company officials currently are talking to greenhouse gas credit brokers about marketing the reductions to buyers of GHG credits.”

Commercial Viability

Energy-from-Waste has extensive operating and environmental experience over the last 60 years. These facilities have proven track records and extensive databases on operating characteristics and emissions. These facilities can and have received bonding, will specify performance guarantees, and will sign up for long term contracts. This proven track record sets this technology apart from most other waste treatment approaches.

By-products

Energy-from-Waste facilities on Long Island offer electricity as an off-take; in other locations steam may be offered as an off-take. All of the Long Island plants are equipped with ferrous recovery with the Hempstead plant equipped with non-ferrous recovery. This enables them to improve recycling rates, as follows:

Long Island Ferrous and Non-Ferrous WTE Recycling Rates					
Year	**Hempstead Ferrous**	**Hempstead Non-Ferrous**	**Babylon Ferrous**	**Islip Ferrous**	**Huntington Ferrous**
02	19,480	994	3,835	4,596	8,634
03	18,543	1,019	3,941	5,494	9,665
04	20,942	1,089	4,804	6,129	9,118
05	19,207	976	5,461	5,205	9,337
06	22,498	1,074	4,336	3,219	5,975
Average	20,134	1,030	4,475	4,929	8,546

Environmental Concerns

Typical concerns about an Energy-from-Waste facility include traffic, odor, emissions, and noise. The existing facilities are already sited, so require no new evaluation for their continued use from a traffic perspective. Any expansion or

new facility would require the requisite traffic analysis. Odors are rarely problematic since the air from the waste drop-off area (tipping floor) and the waste bunker are used for combustion air in the furnace. Given that these facilities are equipped with a stack, and they have been associated with emissions of mercury and dioxins, they engender concern by the public. The pollution control equipment and the design of these facilities eliminate virtually all emissions of concern. All of the Long Island facilities were subject to a Health Risk Assessment to ensure they do not pose unacceptable risks. The NYDEC regulations have specific noise requirements for any solid waste facility. These levels are sufficiently low to ensure that nearby residents do not encounter unacceptable noises. Finally all the Long Island facilities have environmental monitors from the New York State DEC.

Costs and Capacity

Costs of construction are in the $200,000 per ton plus range due to current market conditions. This equates in the vicinity of $80 per ton as a disposal fee. Capacities range from several hundred tons per day to 3,000 or more tons per day.

Potential to Increase Capacity

Under the best of scenarios permitting and construction would take five years. Outside of professional circles, there is a lack of recognition of the scope of the disposal shortfall and its cost and environmental ramifications.

The combustion of MSW reduces MSW waste streams, reducing the creation of new landfills. MSW combustion creates a solid waste called ash, which can contain any of the elements that were originally present in the waste. MSW combustion facilities reduce the need for landfill capacity because disposal of MSW ash requires less land area than does unprocessed MSW. However, because ash and other residues from MSW operations may contain toxic materials, the ash must be tested regularly to assure that the ash can be safely disposed of. Under current regulations, MSW ash must be sampled and analyzed regularly to determine whether it is hazardous or not.[1] Hazardous ash must be managed and disposed of as hazardous waste. Depending on state and local restrictions, non-hazardous ash may be disposed of in a MSW landfill or recycled for use in roads, parking lots, or daily covering for sanitary landfills.

While the four Long Island Energy-from-Waste facilities operate with virtually no public controversy, it is highly likely that there would be public controversy with any planned new facility on Long Island or an expansion of any of the existing plants. Such opposition is likely from neighboring residents and environmental

[1] U.S. EPA, Office of Solid Waste, *MSW Disposal*.

groups. While these entities may be assuaged by the technical merits as articulated by various professional and governmental institutions, it would be imprudent to assume an absence of public controversy should such an option be given serious consideration. Therefore, any such consideration should seek to magnify the beneficial environmental attributes –maximize particulate control technology, maximize efficiency, maximize materials recovery, and minimize other conventional pollutants of concern.

Regulatory Issues

All solid waste collection, treatment, and management are regulated by the New York State Department of Environmental Conservation (NYSDEC) under the Title 6 of the Official Compilation of Codes, Rules and Regulations (6NYCRR) Part 360. The Part 360 regulation offers three levels of authorizations depending upon the activities. These are exemptions, registrations, and permits. Registrations are considered ministerial activities, meeting certain requirements of Part 360 Regulations, such as waste type, ownership status, and throughput requirements. The registration applications normally do not require submission of any formal plans or engineering reports. Therefore, if a new technology were used for the treatment, recycle and disposal of solid wastes, it would fall under the category of exempted or permitted activity.

In general, if solid wastes are received as raw materials for the manufacturing of a usable product and no waste by-product is generated in such processes, the activity can be considered exempt. However, if a facility has a potential for odor generation, requires control of vectors and litter, and may need to transfer waste during down time of the processing equipment, and/or generates waste by-products, the facility will require a permit from the Department.

As such, each new technology needs to be evaluated in detail, on a case-by-case basis, to determine if a permit would be required. If needed, the permit process requires an application with appropriate information, in support of the facility's technical merits, and which answers all environmental questions related to a proposed facility. Since each application is unique in nature, effectively, each application would break new ground. The Department anticipates a more in-depth technical review of submitted information for sufficiency, to determine if a permit was required, and what type or category under which the facility would fall, in the permit process.

In addition to receiving a Part 360 permit, a facility that creates air pollution emissions would require authorization under Air Pollution Control regulations. Depending on the technology and the emissions from the process, one of the following would be required: registration, state air permit, or Title V permit. Similarly, water discharges may require SPDES permits under Water regulations. At the time of making an application to the Department for a facility, the applicant

will be required to provide information regarding the expected emissions, and/or discharges from the facility.

Greenhouse Gas Emissions

The potential emissions of greenhouse gases from waste processing technologies were researched. Greenhouse gases include water vapor, carbon dioxide, methane, nitrous oxide, and ozone. Based on available information, it was concluded that this information is currently not readily available. Many of these alternate technologies are just emerging, or are in small numbers, and are a new method of treating MSW, increasing the difficulty of acquiring quantitative data. Prior to receiving approval to construct and operate such a facility, emissions data and a detailed process description would be provided to the NYSDEC for evaluation as part of an application, as noted above.

5.0 Waste Reduction and Recycling

This section discusses the status of waste reduction and recycling activity in Suffolk County and suggests ways of achieving further gains in County recycling rates. As with any attempt to characterize and/or make projections about waste management activity on Long Island, this discussion is complicated and – to some degree, compromised – by inconsistencies and gaps in available data and the manner in which those data were compiled. Nonetheless, enough useful information is available to allow a reasonably accurate "snapshot" of current waste reduction/recycling efforts, at least enough so as to promote informed discussion and analysis of options for greater achievements in this area.

5.1 Waste Reduction

Waste reduction comprises the first step in the waste management hierarchy adopted by New York State in the Solid Waste Management Act of 1988. Yet, while mentioned in all NYSDEC approved Town Solid Waste Management Plans (SWMPs) it appears to be the element of the hierarchy least emphasized in practice. From 1990 to 2006, per capita waste generation rates in Suffolk County dropped by 3.1% (7.35 lbs/person/day vs. 7.12 lbs [Census Bureau; Swanson & Tonjes]), yet given known inconsistencies and gaps in data gathering, this figure may well be within the margin of error, and is not regarded as an achievement for the State's #1 waste management priority. This is unfortunate and somewhat ironic as achieving significant reductions in waste generation does not require major investments in infrastructure, labor, or technology. In fact, major gains could be achieved through improved coordination, education, information dissemination, and public outreach – in short, a greater public awareness of waste reduction strategies. In the same way that recycling has become ingrained on the public consciousness, so must the same effort be made with regard to waste reduction.

EXAMPLES:

- Encourage manufacturers and retail outlets to reduce packaging. Educate the public to support reduced packaging. For example, a bottle does not need to be placed in a box and then in a bag. A product does not need packaging that is twice the size of its contents. Municipal websites could provide information and updates on packaging related issues including success stories and responsive corporate citizens.
- The practice of re-using materials from building demolition and of finding uses for waste materials from construction projects is growing. The private sector may already recycle a substantial portion of C&D, though this is largely undocumented in Suffolk County. Municipal efforts have been spotty and uncoordinated. At-source C&D separation for re-use should be made a priority for municipal demolition/building projects and could be made *MANDATORY* in public works contracts.

- Municipal government could mandate that public works projects such as roadways or drainage projects contain a minimum percentage of recycled or reused material.
- Disposers of re-usable material could be matched with individuals interested in these items through a free website. These items could include computers, TVs, furniture, toys, books. In business, re-use "clearinghouses" for office items and furniture are common, but residential alternatives to disposal for many other items are not widely known.
- Encourage people to re-use grocery bags instead of disposing of plastic bags. Many stores now sell re-useable grocery bags such as King Kullen and IGA stores.
- Reduce the use of disposable coffee cups by using washable thermos containers or travel mugs. The retail convenience store 7-11 in some cases discounts coffee by 25¢/cup for individuals using their own travel mugs. Some delis offer similar discounts.
- All municipal offices should have white paper recycling and encourage the use of the blank sides of printed paper when possible. The blank sides of waste paper may also be converted into notepads. Many documents can be viewed using electronic media. Paper consumption should be tracked and monitored for reduction yearly.

5.2 Zero Waste Efforts

Zero Waste means designing and managing products and processes to reduce the volume and toxicity of waste and materials, conserve and recover all resources, and not burn or bury them. The Zero Waste System involves changing the rules, shifting subsidies, designing for the environment, source reduction and designing out waste, clean production, distribution, take back, backhauls and reverse logistics, empowered consumerism, producer responsibility, resource recovery parks, jobs from design and discards.

It is estimated that for every ton of MSW, seventy-one (71) tons of waste are generated "upstream". Despite the efforts and success of current reduction and recycling programs the amount of waste increases.

We get to Zero Waste by defining objectives and policies, including interim goals and a target year to achieve Zero Waste. Key Zero Waste policies are extended producer responsibility, environmentally preferable purchasing, ending subsidies for wasting and adopting policies and economic incentives to reduce wasting in contracts and franchises, permits and zoning, general plans garbage rate structures, support and expand existing reuse, recycling and composting businesses and non-profits, develop locally owned and independent infrastructure, and develop local and regional resource recovery parks to provide locations for expansion of reuse, recycling and composting businesses.

Several communities, such as Seattle, San Francisco, have committed to a goal of Zero Waste. It would be interesting for the County to track their efforts and report to the Towns on a periodic basis.

5.3 Pay Per Bag System

One of a number of volume-based pricing systems for garbage, the "pay per bag" system (also known as "pay as you go" or "pay as you throw") is a way of assigning some or all of the cost of waste management directly to the *individual* who generates the waste, as opposed to funding waste management costs through property taxes (thereby treating waste costs the same as electric or water utilities). Nearly 10,000 communities nationwide (Skumatz) have adopted some sort of pay as you throw program (not all involve bags). "Pay-Per-Bag" tends to lower disposal rates and is now promoted by New York State as a method for reducing waste generation. Hudson and Tompkins counties were the first New York communities to adopt such programs in the late 1980s. It has since expanded both state-wide and nationally. Three eastern Suffolk Town have used "pay as you throw" for garbage since the early 1990s: Shelter Island, Southampton, and Southold. In those towns, residents buy special plastic bags at a fee set to pay the actually cost of disposing of the amount of waste in the bag. Each town makes several different size bags available, which are priced accordingly (e.g., Southold's "Large" size bag – 48 gallons and holding up to 75 lbs – costs $2.25).

The impact of "pay as you throw" has been consistent: where it has been adopted, waste generation decreases and recycling rates increase substantially (in Southold, recycling tonnage increased by 100% the first year (Bunchuck). Nonetheless, there is a perception that "pay as you throw" is better suited to smaller, more rural communities than urban and suburban areas with diverse populations and more multi-family dwellings. However, experience shows that these factors can be overcome: Seattle is famously known to have the highest big city recycling rate, achieved through aggressive use of "pay-as-you-throw" (Skumatz). Cities such as Kansas City, Charleston, and San Antonio, as well as suburban density communities in New York, Massachusetts, Ohio, and Virginia have had similar success with this system.

In Nassau and western Suffolk, however, several factors have been mentioned as likely to limit the ability to replicate the success of "pay-as-you-throw" elsewhere. While not necessarily unique, their combined effect on the local governmental and political establishment may make it uniquely difficult to implement this system on Long Island:

1) <u>Bureaucracy</u>: The multiple layers of government responsible for providing waste management services for the majority of Long Island residents – i.e., the districts, towns, and incorporated villages – are largely tied to a complex management and tax structure that may not adapt well to a "pay-

as-you-throw" revenue stream that can vary – indeed, should actually *shrink* if it works as intended – depending upon "consumer" behavior.

2) Taxation: Highly taxed Long Islanders may not be swayed by the economic incentive of "pay-as-you-throw," especially if there is not a reduction in taxes equivalent to the new "pay-as-you-throw" income. *[For most Long Islanders, tying "pay-as-you-throw" to environmental and quality of life improvements (by reducing waste, truck traffic, fuel consumption, etc) may be a more effective approach to gaining acceptance. It can easily be seen as a natural component of the "Go Green" movement.]*
3) Lifestyle: "Pay-as-you-throw" inherently demands a more active approach from residents with regard to handling their waste. People must think more about source-separation and possibly about what type of bag or container is being used for which item. Most in the waste industry regard this as healthy behavior, but Long Islanders' busy lifestyle may work against spending more time on garbage.

RECOMMENDATION

BEGIN A PILOT PROJECT

"Pay-as-you-throw" has enough of a successful track record in populated areas to justify expansion of this system on Long Island. The County should promote analysis of where the system stands the best chance to succeed, and support its implementation through one or more pilot projects.

5.4 Bottle Bill

New York State, several years ago, passed legislation placing a five cent deposit on carbonated beverage containers as a litter control measure and to enhance recycling. The beverage wholesaler initiated the five cent deposit on the container when the product was sold to the retailer. The consumer paid the nickel to the retailer. When the empty container was returned the process was reversed. The wholesaler ultimately kept the nickels from the unclaimed deposits, which amounted to significant monies.

Litter was reduced and recycling volumes were increased as relatively clean sorted containers were transferred from wholesalers to materials markets. As time progressed there were movements to increase the deposit to ten cents or even a quarter to make redemption more economically favorable as nickels lost their value over time. Also there were opinions expressed that the monies from the unclaimed deposits should be claimed by the State and directed to environmental programs rather than remaining with the wholesalers.

A larger factor, since the passage of the legislation, was the evolution and rapid expansion of the non-carbonated drink market. Products such as water, iced tea, juices, and energy drinks have sales greater than the carbonated beverages.

The State now has proposed legislation that would extend the deposit to non-carbonated beverage containers also and have the non-claimed deposits transferred to the State. The draft legislation is known as the "Bigger, Better Bottle Bill". The legislation has not progressed in the legislature. There is strong opposition from the beverage sales industry concerned about having space to collect and store the redeemed containers, as well as, staff to run the operation. There has also been concern expressed about profitable containers being withdrawn from local municipal curbside collection programs. Adoption of the legislation would, once again, assist in the reduction of litter, especially the ubiquitous water bottle, and increase the recycling of these containers.

5.5 County Plastic Bag Legislation

Suffolk County Legislator Wayne Horsley, introduced legislation to implement a *Plastic Bag Reduce, Recycle, Reuse* measure to encourage the use of reusable bags by consumers and retailers, reduce the consumption of single-use bags, and establish an at-store recycling program for plastic bags by January 1, 2009.

"Today's *Reduce, Recycle, Reuse* measure is a practical solution to a plastic problem. By promoting reusable bags grocers can cut spending, generate new revenues, and provide shoppers with durable a product. The concept is just great business acumen, and consequently a boon to our environment," Horsley said. "However, we recognize that the consumption of plastic bags while shopping is a common social behavior that cannot be mandated out of existence. So, our program calls for corporate citizenship, allows for personal choice, and encourages recycling through convenience and free-market demand."

Horsley introduced the *Reduce, Recycle, Reuse* measure, which calls on establishments over 10,000 square feet to: 1) establish a visible, accessible, at-store plastic carry out bag collection bin for the purpose of collecting and recycling plastic carryout bags, 2) to collect, transport, and recycle collected bags in a manner consistent with all applicable laws, and 3) for retailers over 20,000 square feet to make reusable bags available to customers within the store, which may be purchased in lieu of using a plastic carryout bag or paper bag. The Horsley legislation was passed into law by the Legislature and is now in effect in Suffolk County.

5.6 Beneficial Use of MSW Combustor Ash

During the next few years, modifications to Long Island's solid waste management strategies can be expected. Already, movements toward an expansion of the Hempstead waste-to-energy (WTE) facility are taking place. This is but the initial alteration and it is entirely possible that as agreements among municipalities and Long Island's waste-to-energy provider are negotiated, additional facility expansions are possible. As the amount of solid waste being combusted on Long Island increases, so will the amount of ash requiring management increase. Currently, Long Island has two monofills permitted to receive the combustion by-products. One is close to achieving its permitted capacity and once that is achieved the remaining disposal site in Brookhaven will be receiving all the ash from Long Island's WTE facilities. One may argue over the expected longevity of the Yaphank facility but there can be no argument that, like the monofill in Babylon, it has a finite life. Long Island has for too long focused solely on ash disposal.

Long Island is recognized internationally as a leader in developing environmentally acceptable ash utilization strategies. Research undertaken in this region and applied in Europe, Asia and in our neighboring state of Pennsylvania, has demonstrated that ash can be processed, generating an engineered aggregate and beneficially utilized in diverse construction applications. Technically there remain no barriers to hinder ash utilization. Environmental concerns have been studied in-depth and every investigation has clearly demonstrated that processed MSW combustor ash presents no adverse impacts. European nations have for decades been beneficially using MSW combustor ash and no adverse impacts have been reported.

Long Island's reluctance to embrace ash utilization is a result of perceived financial, regulatory and institutional barriers. The income to municipalities hosting ash monofills is not trivial. Ash utilization clearly will reduce the amount of residuals entering the monofill and have an immediate financial impact. Decision makers, while understanding the financial benefits associated with landfill void space, are more focused on the short term revenue stream ash disposal represents.

Regulatory and institutional barriers, while not insurmountable, as perceived by the ash utilization supporters are significant. The financial investment necessary to pursue ash utilization is considered a risky endeavor given there is never a guarantee that permits will be forthcoming. Potential liability has always been a concern.

Long Island has taken the easy path over the past two decades with respect to ash management. Brookhaven's landfill will however one day achieve capacity and much sooner than anyone wants to admit, especially if the Babylon monofill

closes sooner than expected. Siting additional capacity will be financially and politically very costly. In life, timing is everything and Long Island is rapidly approaching the time when it needs to develop a long-term ash management plan that includes utilization.

5.7 Single Stream Technology

Single-stream technology actually refers to single-stream recycling (also known as “fully commingled”) which is a system wherein all residential recyclables (paper fiber, plastic and metal containers, glass bottles, etc.) are mixed together for collection and processing rather than “source-separated” by residents and handled separately throughout the collection process. There are a number of presumed advantages to the “single-stream” approach, including the following (Wisconsin DNR):

- Reduced sorting effort by residents, resulting in greater participation and diversion rates;
- Reduced collection costs due to improved route efficiency (i.e., one recycling vehicle can collect all recyclables);
- Greater fleet flexibility (i.e., allows for single compartment vehicles);
- Potential ability to add new materials to recycling programs.

The greatest efficiencies from single-stream technology have been realized in communities that have automated recycling collection programs, where significantly reduced collection costs and savings in worker injury rates have been documented (California Department of Conservation (DOC), Feb. 2007).

While these advantages are real, they are not always realized. In particular, communities without automated collection systems are not likely to experience significant savings. Also, even in communities where savings in collection are achieved, these can be largely offset by higher disposal costs for “contaminated” recyclables delivered to MRFs that are not designed to process single-stream flows adequately. Specifically, the following disadvantages have been noted (DNR):

- Higher capital costs for new carts, collection vehicles, MRF upgrades, public education;
- Higher processing costs;
- Lower quality recycling commodities resulting in lower prices;
- Loss of public confidence in recycling if more recyclables end up in landfills due to unmarketability.

Single-stream technology appears to work best in areas with 1) highly automated collection systems and 2) a high level of planning unit control over the MRFs accepting the commingled recyclables, in particular those operated by or under contract with, the planning unit (DOC). In Suffolk County, the lack of

standardized collection systems and vehicles and MRF technologies among the towns – and sometimes even *within* them - is likely to inhibit county-wide success of single-stream technology for the foreseeable future.

The Town of Brookhaven is the only Suffolk Town actively considering the use of single-stream technology. The other Suffolk towns continue to rely on either fully source-separated programs (eastern Suffolk) or the more common 2-stream systems (mixed paper fibers and mixed cans/glass/plastic). In Nassau County, the Towns of Hempstead and Oyster Bay have also begun to examine the potential benefits a single-stream system.

5.8 Composting

Yard waste constitutes nearly 1/3 of Long Island's waste stream and, as produced by nature, is 100 percent free of contamination and ready for composting. Long Island has strong, natural markets for clean compost that are conveniently accessed, and its soils need to be replenished if groundwater contamination is to be reduced, and there is no technical reason that a sustainable compost program cannot be implemented for virtually all yard waste generated. The rationale for composting of yard waste in Suffolk County is almost uniquely powerful.

When NYSDEC outlawed disposal of yard waste through landfilling or incineration in the 1980s, there was only one municipal compost facility in Suffolk County (Islip) and few, if any, legal private ones. Most yard waste continued to be disposed of or shipped off-Island at significant cost. With time, permitted composting has grown and over the past 15 years, given improved public understanding and a track record with some well-operated facilities, it is now more widely accepted as an important and necessary element of waste management in Suffolk County.

As reported to the Commission, there are seven municipal yard waste compost sites in Suffolk County, although it is unclear if all seven are permitted facilities. There are several private facilities as well, some of which handle municipally collected materials under contract. East End farms and other open lands have been used by the established compost facilities to accommodate the excess flow in legally permitted amounts, for a fee to the property owner.

Nonetheless, in Suffolk, the combined capacity at all legal sites (public and private) is still insufficient to handle all the yard waste produced. This has led to the establishment of small non-permitted sites which do not conform to accepted quality or safety standards. Such "under the radar" facilities usually do not attempt to properly compost but rather simply grind the waste to reduce the volume. This can and has let to safety and environmental concerns (fires, contamination with treated wood and other construction lumber), and contributes

to public fears about composting, which can undermine attempts to develop adequate, permitted composting capacity.

While leaves make up the primary feedstock for quality compost, nearly one-half of Long Island's yard waste consists of branches and brush. The time frame for managing brush into compost at outdoor compost facilities can be more than twice as long as for leaves (2+ years). For this reason, facility operators – most of whom have severe space limitations – usually seek markets for the brush at an earlier stage of decomposition, normally as woodchips. Unfortunately, markets for woodchips have traditionally been more limited than for finished compost, but they do exist and they continue to develop, though on Long Island this has been a slow process. Locally, woodchip mulch is mostly used for weed control on farms, nurseries, golf courses and home gardens. In some regions, the use of woodchips in public works projects has grown in recent years. In Texas, for example, their use has been incorporated into specifications for highway erosion control and slope stabilization (Alexander). Expansion of markets for woodchip mulch is important to ensure its timely removal from sites with little storage space.

RECOMMENDATIONS

Promote public participation in composting through increased education. The County's Department of Public Works can utilize composted materials in grading projects as well as fields, park trails, and golf courses. The County can play a supportive role in locating additional public and private composting facilities in appropriate locations. The County may also consider using woodchip products in roadside erosion control projects and as filter material for road run-off.

5.9 Expanding Recyclable Markets

- Research potential for common marketing arrangements between towns;
- Help identify local markets for recyclables;
- Commit to using recycled materials at County facilities
- Research/develop composting markets
- Promote investment in manufacturing infrastructure for recycled items, especially those with potential local markets

5.10 Education

- Establish a Suffolk County Waste Management Directory/Website containing information on waste management and recycling from all the Towns;
- Develop/support development of county and/or town brochures in a common format;

- Produce a Suffolk County/Long Island Annual Report on Waste Management to track developments and identify needs;
- Produce/promote bi-lingual information sources in the County and among the Towns;
- Use electronic signs (such as on the LIE) for updates/reminders about recycling programs, events, messages about litter control, etc.

Yard Waste Report-by: Michael Desgaines Cornell Cooperative Extension

Introduction

This report will give an overview of the management of yard waste in Suffolk County. All ten townships, several of the incorporated villages, and various privately operated recycling facilities located within the county were surveyed to ascertain how materials are collected, the type and volume of materials generated, management practices utilized, and the associated costs.

Ascertaining this information was challenging since many privately operated facilities are reluctant to divulge this information and most of the surveyed municipalities do not keep accurate records. Adding to the difficulty is the fact that some facilities record materials in cubic yards (cy) while others track materials by tonnage (T). For reference, the standard conversion factor for converting yard waste materials from CY to T is: 5cy per T. All data will be presented in tons in this report.

What is Yard Waste?

Yard waste is comprised of three basic materials: leaves that account for the majority of materials generated, grass and brush or clippings. Brush can be further described as branches, limbs, and hedge trimmings. Tree limbs and branches are usually restricted to a size of less than four inches in diameter. Oversized materials referred to as “land clearing” material such as tree trunks or root balls are not accounted for in this report.

Estimated Tonnage Generated

It is estimated that the various municipalities located in Suffolk County generate approximately 215,000 T of yard waste. The majority of this material consists of leaves that account for approximately 75% or 165,000 T. Inclusion of the numerous privately managed yard waste-recycling facilities would increase this estimated number to 270,000 T.

Summary of Yard Waste Management in Suffolk County

Collection

The majority of municipalities collect leaves curbside in plastic bags. This service is predominately scheduled for the fall and spring leaf seasons when the bulk of materials are generated, although some municipalities offer this service throughout the year. Most towns will collect leaves and brush separately and encourage residents to mulch mow and will not accept grass.

Several of the eastern towns - Riverhead, Southampton and East Hampton - collect materials un-bagged curbside using either vacuum trucks or front-end loaders and dump trucks.

Southold has recently mandated that residents use biodegradable paper bags, a trend that will eventually become mainstream. A handful of municipalities including the Villages of Lake Grove and Rockville Center (Nassau County) utilize paper bags while Brookhaven provides paper bags for residential brush collection. Materials collected in paper bags account for only a small fraction of the total materials collected.

Several villages such as Brookhaven Hamlet and Bellport have instituted successful backyard composting programs that have significantly reduced the volume of materials to be managed.

Brush collection is usually limited to materials no larger than four inches in diameter and three to four feet in length. Several privately operated facilities will accept larger “land clearing” material and unadulterated lumber to produce wood mulch. This type of material is not accounted for in the report.

Management

Of the towns surveyed only three - Babylon, Huntington, and Smithtown - do not compost all or a portion of the leaves generated. Materials generated collectively by these towns account for approximately 40% or 72,000 T of the total generated in Suffolk County.

The Towns of Islip, Southold, and East Hampton have successfully established yard waste recycling facilities. Brookhaven has recently reinstituted its composting program while rural townships such as Shelter Island, Southampton, and Riverhead rely on a multifaceted approach involving local farms and privately operated facilities.

Since the majority of municipalities have established yard waste recycling facilities, most of the materials generated are managed and recycled locally. The

total volume of municipally generated materials recycled, either by composting or grinding, in Suffolk County is approximately 70 percent or 160,000 T.

Towns that do not self-manage their yard waste contract with private companies to handle materials. These companies include Omni Recycling, Long Island Compost and Waste Management. The associated cost of contracting ranges between $52 and $56 per ton. The cost of handling materials will increase significantly when the majority of these contracts expire in 2008 with the average estimated cost to reach $65 per ton. The final destination of materials collected includes off-island facilities or utilizing local farms as satellite composting operations.

An estimated 70 percent or approximately 160,000 T of yard waste material that is generated in Suffolk County is recycled within the county. Products such as compost, decorative wood mulch and topsoil blends are successfully marketed to landscapers, homeowners and wholesale and retail outlets.

Summary of Individual Town Management Programs

Huntington (24,000 T)
Contact: Audrey Gallo, Recycling Coordinator

The Town of Huntington generates approximately 24,000 T of yard waste per year. Although a breakdown of the type of material is not available, it is estimated that leaves account for 20,000T, brush 3,000 T and grass 1,000 T of the total materials collected.

Materials are collected curbside in plastic bags by both contracted carters and town employees throughout the year with collection frequency increased during the fall and spring leaf seasons. A residential drop-off center is located at the transfer facility. Landscapers are not permitted to use the facility.

Grass is accepted only at the drop-off facility and brush is limited to four inches in diameter and length.

The town currently contracts with Omni Recycling to receive materials collected by the carters at a rate of $53 per ton. Materials received at the transfer station, predominately grass are transported to local farms for composting.

Smithtown (27,000 T)
Contact: Matt Gorecki, Sanitation Supervisor
The Town of Smithtown manages approximately 27,000 T of yard waste material per year of which approximately 20,000 T are leaves and 6,000 T brush.

Materials are collected curbside in plastic bags throughout the year by contracted carters. The town's highway department will also collect materials in the fall and

spring leaf season when the volume of material is significantly increased. Landscapers and homeowners are permitted to utilize the transfer facility. All types all yard waste materials are accepted at the facility, however disposal of grass is not encouraged at curbside pick-up. Brush is accepted but is restricted in size to less than six inches in diameter.

The Town currently contracts with Omni Recycling to receive leaves and a portion of the brush generated at a rate of $56 per ton. The Town's sanitation department processes brush to produce wood mulch that is made available to whomever desires at no charge.

Babylon (19,000T)
Contact: Vicky Russell, Commissioner of Solid Waste

The Town of Babylon generates approximately 19,000 T of yard waste material per year. These materials, including grass are collected commingled curbside in plastic bags throughout the year on a weekly basis by contracted carters. Landscapers are not permitted to use Town facilities.

The town currently contracts with Omni Recycling to receive materials at a rate of $53 per ton.

Islip (57,000 T)
Contact: Dr. Stuart Buckner

The Town of Islip manages approximately 57,000 T of yard waste materials annually of which approximately 40,000 t is leaves, 12,000 T brush and 5,000 T grass. Materials are collected curbside in plastic bags by both contracted waste haulers and Town personnel.

Both landscapers and residents are permitted to utilize the composting facility throughout the year. Grass is permitted at the facility but is not collected curbside. Restricted sized brush is collected curbside and larger sized brush is permitted at the composting facility.

The town has successfully established a yard waste recycling facility that processes all materials received. Leaves and grass are composted and brush is ground to produce wood mulch. A market for finished material is readily available and all recycled materials are sold to commercial operators, utilized within the town or given to town residents.

Brookhaven (43,000 T)
Contact: Ed Hubbard, Deputy Commissioner of Solid Waste

The Town of Brookhaven currently generates approximately 43,000 T of yard waste materials per year of which 36,000 T are leaves, 6,000 T brush and 1,000 T grass.

The vast majority of these materials is collected curbside in plastic bags by contracted haulers throughout the year with and expanded collection schedule being implemented during the fall and spring leaf seasons. Three drop-off facilities are available to residents with two being available to landscapers.

Leaves and brush are collected separately with brush limited to no larger than four inches in diameter. Grass is accepted at the drop-off facilities but is not collected curbside.

The Town's Waste Management Department processes brush to produce wood mulch that is available to residents at no charge and to landscapers for a nominal fee. The majority of this material is utilized by other town departments for decorative purposes.

The Town has recently reestablished a composting program that will manage 50 percent of the leaves generated within the Town. The remaining material is contracted to and managed by Long Island compost at a rate of $54.50 per ton. Long Island compost had managed all materials collected curbside during the period of 2001 to 2006. Previous to this arrangement the Town composted all materials collected.

Riverhead (5,000 T)
Contact: John Reeves, Sanitation Superintendent

The Town of Riverhead currently generates approximately 5,000 T of yard waste materials per year of which 3,500 T is leaves and 1,500 T is brush.

The Town's Highway department collects leaves and brush curbside utilizing either vacuum trucks or front-end loaders and dump trucks. Collection is performed twice per year, once in the fall and spring. Residents are permitted to utilize the drop-off center throughout the year. Landscapers must use privately operated facilities.

The Town currently contracts with Speonk Wood Recycling to process brush to produce wood mulch. This material is given to residents and local farms at no charge. Leaves are managed in a variety of methods including on-farm composting.

Southampton (15,000 T)
Contact: Bill Masterson, Highway Superintendent

The Town of Southampton currently generates approximately 15,000 T of yard waste per year of which 11,000 T is leaves and 3,000 T is brush.

The Town's Highway Department collects both leaves and brush curbside in the fall and spring utilizing either vacuum trucks or front-end loaders and dump trucks. There is no municipal collection during the year. Landscapers and residents are permitted to utilize the tree drop-off facilities to deposit leave and brush. Grass in not accepted.

The Town's Waste Management Department grinds brush to produce wood mulch that is available to residents and landscapers at no charge. A portion of the leaves is composted at the Town's composting facility while the remaining volume is shipped to local farms.

East Hampton (10,000 T)
Contact: Pat Keller

The Town of East Hampton currently generates approximately 12,000 T of yard waste per year of which 7,000 T is leaves and 3,000 T is brush.

The Town's Highway Department collects leaves and brush curbside utilizing vacuum trucks in the spring and fall. Both landscapers and residents are permitted to utilize the composting facility throughout the year. Grass is accepted at the facility but is not collected curbside. Only restricted size brush is accepted

The Town's Waste Management Department processes both brush and leaves at the composting facility to produce wood mulch and compost. These materials are either sold to landscapers or given to Town residents.

Shelter Island (1,200)
Contact: Teresa Manlant

The Town of Shelter Island currently generates approximately 1,200 T of yard waste materials per year.

There is no municipal collection. All materials must be brought to the recycling facility by either residents or landscapers.

All materials generated, compost or wood mulch are made available to residents at no charge.

Southold (8,000T)
Contact: Jim Bunchuck, Sanitation Supervisor

The Town of Southold currently generates approximately 8,000 T of yard waste material per year of which 3,500 T are leaves and 4,500 T is brush.

The Town's Highway Department collects leaves curbside in biodegradable paper bags during the fall and spring leaf seasons. Landscapers and residents are permitted to utilize the composting facility throughout the year. All materials are accepted at the facility.

The Town's Sanitation Department grinds brush to produce wood mulch and compost leaves and grass to produce compost. These materials are either marketed to area landscapers or made available to town residents.

Commercial Yard Waste Recycling Facilities

There are many privately operated yard waste recycling facilities located in Suffolk County. These facilities accept materials such as leaves, brush, grass and land clearing from landscapers and property developers.

These materials are recycled to produce decorative wood mulch, compost and topsoil blends. All materials are successfully marketed to landscapers and a few companies bag and sell their products in retail outlets such as Home Depot.

Ascertaining the tonnage of materials these companies generate is difficult since most of these facilities were reluctant to provide such information.

Several of the privately managed facilities include:

Long Island Compost – Yaphank
Chip it All – Port Jefferson Station
Ketcham Farm Organics–Kings Park
Watral & Sons- Central Islip
Global Land Products – Brookhaven
East Coast Mines – East Quogue
Crown Materials – Riverhead
Hubbard Materials – Deer Park
Omni Recycling – Babylon
Speonk Wood Recycling–Speonk

A conservative estimate of 55,000 T of materials is handled by these establishments with the majority of this material being wood or brush.

Summary

It is estimated that approximately 270,000 T of yard waste materials are generated in Suffolk County every year of which the various municipalities collect 215,000 T and an additional 55,000 T by privately managed recycling facilities. The majority of municipally generated material is leaves that account for approximately 65% or 165,000 T. Privately operated facilities process equal percentages of both leaves and brush.

The majority of this material is recycled, that is either composted or ground into wood mulch within the County. Only the three most western townships, Babylon, Huntington, and Smithtown do not compost materials.

Contacting with commercial haulers to collect materials curbside in plastic bags is the predominate means of materials collection. Approximately 10% or 24,000 T of the total materials generated is collected loose and an estimated 2% in biodegradable paper bags.

The establishment of on-farm composting has significantly increased the tonnage of materials recycled within the County. Commercial companies such as Long Island Compost and Omni Recycling as well as several municipalities have recently begun to utilize East End farms as yard waste recycling sites.