

**COMMERCIAL WASTE MANAGEMENT STUDY
CONSOLIDATED EXECUTIVE SUMMARIES**

VOLUMES I THROUGH VI

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Prepared for:

**New York City Department of Sanitation
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Prepared by:

**Henningson, Durham & Richardson
Architecture and Engineering, P.C.**

**and its
Subconsultants**

This report was prepared by



**Henningson, Durham & Richardson
Architecture and Engineering, P.C.**

**and its
Subconsultants**



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List of Acronyms/Definitions

Acronyms	
ach	air changes per hour
BIC	Business Integrity Commission
C&D	construction and demolition
CD	community district
CEQR	City Environmental Quality Review
CH ₄	methane
CNG	compressed natural gas
CO	carbon monoxide
CRAB	Citywide Recycling Advisory Board
DOC	diesel oxidation catalyst
DPM	diesel particulate filter
DSNY	New York City Department of Sanitation
ECB	New York City Department of Environmental Protection's Environmental Control Board
ECL	State Environmental Conservation Law
FHWA	Federal Highway Administration
HC	hydrocarbons
HCS	Highway Capacity Software
HEV	hybrid electric vehicle
ISCST3	Industrial Source Complex Short Term
ITE	Institute of Transportation Engineers

Acronyms	
LL74	Local Law 74, effective December 19, 2000, enacted by the City Council, requiring a comprehensive assessment of commercial solid waste management in New York City
LOS	level of service
MSW	municipal solid waste
MTS	marine transfer station
NAAQS	National Ambient Air Quality Standards
NO ₂	nitrogen dioxide
NO _x	nitrogen oxide
NYAC	New York Air Code
NYCAC	New York City Administrative Code
NYCDEP	New York City Department of Environmental Protection
NYCDOT	New York City Department of Transportation
NYCRR	New York Codes, Rules and Regulations
NYSDEC	New York State Department of Environmental Conservation
NYSDOT	New York State Department of Transportation
OEM	original equipment manufacturers
PADEP	Pennsylvania Department of Environmental Protection
PCE	passenger car equivalent
PIU	DSNY's Permit and Inspection Unit
PM	particulate matter
PM _{2.5}	particulate matter less than 2.5 microns in diameter

Acronyms	
PM ₁₀	particulate matter less than 10 microns in diameter
ppm	parts per million
RCNY	Rules of the City of New York
RFP	Request for Proposals
SCR	selective catalytic reduction
SO ₂	sulfur dioxide
SPDES	State Pollution Discharge Elimination System
SWAB	Borough Solid Waste Advisory Board
TNM	Traffic Noise Model
tpd	tons per day
ULSD	ultra-low-sulfur diesel fuel
USEPA	United States Environmental Protection Agency
µg/m ³	micrograms per cubic meter
WTE	waste-to-energy

Definitions	
Building Code	New York City's Building Code
City	New York City
Commercial Waste Capacity Scenario	Scenario which identifies the available capacity on an hourly basis at each Converted MTS, and provides the basis on which potential air quality and noise impacts associated with the delivery of commercial waste in nighttime hours can be evaluated
Consultant	The DSNY's Consultant Team, including Henningson, Durham & Richardson Architecture and Engineering, P.C.; Parsons Brinckerhoff Quade and Douglas, Inc.; Ecodata, Inc.; Franklin Associates, Ltd.; Urbitran Associates, Inc.; HydroQual, Inc.; and Cambridge Environmental, Inc., who prepared the Commercial Waste Management Study
Converted MTS	One of DSNY's eight marine transfer stations, modified to containerize waste for out-of-City export by barge or rail
Draft Study Scope	Commercial Waste Management Study Draft Scope of Work issued February 2003
DSNY-managed Waste	Solid waste that DSNY collects from all residential households in the City and the institutional waste of City, state and federal agencies that DSNY collects and/or for which DSNY arranges disposal
DSNY-managed Waste Reserved Capacity Scenario	Scenario which determines the Converted MTS capacity that would be required for DSNY-managed Waste to provide for an adequate margin to meet its peak demand requirements under all conditions except declared waste disposal emergencies

Definitions	
Final Study Scope or Final Scope of Work	Commercial Waste Management Study Final Scope of Work issued on July 31, 2003
MTS Conversion Program	The City's initiative to develop, at the sites of the existing marine transfer stations (MTSs), new converted MTSs that will containerize solid waste for long-term export by barge with the potential for additional intermodal transfers to enable delivery of containerized waste to disposal facilities outside of the City
New SWMP	The new comprehensive Solid Waste Management Plan to be developed in 2004 for both DSNY-managed Waste and commercial waste for the planning period 2004 through 2024
New SWMP Planning Period	The 20-year period from 2004 to 2024 addressed by the City's New Solid Waste Management Plan
Preliminary Report	The New York City Comprehensive Commercial Waste Management Study Preliminary Report dated June 2002
Quarterly Reports	Quarterly Transfer Station Report system
Study	Commercial Waste Management Study
Study Area	One of the following four locations with high concentrations of commercial waste Transfer Stations: Jamaica, Queens CD #12; Brooklyn CD #1; Port Morris, Bronx CD #1; and Hunts Point, Bronx CDs #2 and #9
Transfer Station	Privately owned and operated transfer station in New York City that accepts, transfers and transports some portion of municipal solid waste or construction and demolition debris or fill material generated in the private sector for out-of-City disposal

Definitions	
Waste Hauling Vehicle	Collection vehicle/transfer trailer that is used to transport municipal solid waste, C&D debris or fill material to or from the Transfer Stations
Zoning Resolution	New York City's Zoning Resolution

1.0 BACKGROUND

Every day, private carting companies collect the commercial solid waste generated in New York City (City)¹ and transport most of it to local facilities known as “Transfer Stations” where, after any sorting and processing, it is transferred to larger vehicles for further transport and final disposition. The City currently has 69 Transfer Station permits or other authorizations for the 62 private facilities at which such waste is transferred.² In addition to disposal of putrescible, non-putrescible and fill material wastes, private carters, Transfer Station operators and recycling companies divert significant quantities of materials to recycling, including paper, cardboard, metal, glass, plastic and materials recovered from processing construction and demolition (C&D) debris and the processing of fill material. Because the City has no operating landfills, incinerators or resource recovery facilities, all waste³ generated in the City is either transferred from privately owned and operated Transfer Stations within the City or carted directly out-of-City for transfer and/or disposal. Except for waste transported by rail from one Transfer Station in the Bronx and another in Brooklyn, practically all waste exported from the City is dependent upon truck transport. The private waste management industry is an essential part of the City’s infrastructure that the City’s residents and businesses depend on every day to maintain the public health and attractiveness of the City.

Under City Department of Sanitation (DSNY) regulations, private carters and privately owned Transfer Stations are permitted to receive and process specific types of waste material, either putrescible waste, non-putrescible waste or fill material. These three types of waste are described below.

¹ The City Department of Sanitation (DSNY) is responsible for the collection and/or arranging for disposal of all waste generated by City households, as well as waste from City, state and federal agencies and not-for-profit institutions in the City (DSNY-managed Waste).

² A few Transfer Stations hold dual permits to process putrescible and non-putrescible waste in separate areas at the same site. A few Transfer Stations have permits at separate addresses that are contiguous and operate as an integrated facility. Two intermodal facilities transload sealed, containerized waste from truck to rail but involve no waste processing.

³ Under Interim Export contracts in 2003, approximately 7,250 tons per day (tpd) of DSNY-managed Waste were transferred out-of-City through in-City private Transfer Stations. Approximately 6,209 tpd of the total 7,248 tpd of commercial putrescible waste disposed were also transferred at these facilities.

1. *“Putrescible waste” is solid waste containing organic matter having the tendency to decompose with the formation of malodorous by-products. Putrescible waste generated by the City’s businesses is principally office and retail waste with small quantities of putrescible material, but also includes restaurant and other waste. Significant amounts of office waste are recycled directly at the source by carters that primarily collect recyclable office paper from commercial buildings and deliver it to recyclers, exporters or paper manufacturers. Consistent with DSNY rules, putrescible waste referred to in this report includes the portions of commercial putrescible waste that are both disposed and recycled (such as office paper).*
2. *“Non-putrescible” waste is waste that does not contain organic matter having the tendency to decompose with the formation of malodorous by-products, including but not limited to dirt, earth, plaster, concrete, rock, rubble, slag, ashes, waste timber, lumber, Plexiglas, fiberglass, ceramic tiles, asphalt, sheetrock, tar paper, tree stumps, wood, window frames, metal, steel, glass, plastic pipes and tubes, rubber hoses and tubes, electric wires and cables, paper and cardboard.*
3. *“Fill material” is a subset of non-putrescible waste and, as defined in DSNY rules, is clean material consisting of earth, ashes, dirt, concrete, rock, gravel, asphalt millings, stone or sand.*

It is important to keep in mind these definitions in reviewing the Executive Summaries for each of the individual volumes, which follow.

DSNY is developing the City’s new comprehensive Solid Waste Management Plan (New SWMP) that will address the long-term management, for the planning period 2004 through 2024 (New SWMP Planning Period), of both DSNY-managed Waste and commercial waste. To assess the effectiveness of the existing framework of rules and regulations and current enforcement practices governing operation of Transfer Stations and the operations of private carters in the City, the City Council enacted Local Law 74 of 2000 (LL74), effective December 19, 2000. LL74 mandated a study of commercial waste management in the City by a Consultant engaged by DSNY. This Commercial Waste Management Study (Study) undertaken

to comply with LL74 is intended to enable the City to assess and plan for management of the commercial waste stream in the most efficient and environmentally sound manner, and to assist in the development of the New SWMP. A copy of LL74 is provided as Attachment A.

To develop the Draft Scope of Work for the Study (Draft Study Scope), DSNY conducted a series of meetings in November and December of 2002 to solicit comments from elected officials, the public, the Citywide Recycling Advisory Board (CRAB), the Borough Solid Waste Advisory Boards (SWABs), community boards, environmental organizations, academics and other interested organizations. On March 3, 2003, the Draft Study Scope was posted on the DSNY website (www.nyc.gov/sanitation) for further public comment. Concurrently, the Draft Study Scope was mailed to all elected officials and Community Boards, the CRAB, the SWABs and to individuals who attended the public meetings held in 2002 and/or submitted comments in connection with the development of the Final Study Scope. Public comments received both during and after the established public comments period consisted of 19 letters (three from elected officials, two from solid waste industry representatives, one from a national environmental organization, four from the CRAB, six from neighborhood organizations or coalitions and three from special interest representatives). The letters were reviewed and a Final Study Scope was issued on July 31, 2003, and is provided as Attachment B. The Final Study Scope broadened the set of issues to be addressed in the Study by, for example, including studies of commercial waste generation, potential siting of new Transfer Stations in Manhattan and the availability of long-term volume waste disposal capacity to the City.

2.0 STUDY ORGANIZATION

The Study has been organized into six separate volumes, which provide a detailed discussion of the work undertaken and the findings, as well as any relevant recommendations. Additional technical backup data is included as attachments in the individual volumes or, in cases where it is voluminous, it is available in CD form on request. A brief description of the content of each volume is provided below.

2.1 Volume I: Private Transfer Station Evaluations:

This volume reports on the results of three separate evaluations.

- Four Study Areas with Transfer Stations in Geographical Proximity;
- Engineering and Operations Survey of Selected Transfer Stations; and
- Effectiveness of Enforcement

The first study examines Transfer Stations in geographical proximity located in the four Study Areas of Port Morris, Bronx Community District (CD) #1; Hunts Point, Bronx CDs #2 and #9; Jamaica, Queens CD #12; and Brooklyn CD #1 and provides the results of evaluations undertaken to assess the potential overlapping effects of such proximity on air quality, odor, noise, traffic, neighborhood character, public health and water quality. The second study reports the results of a survey of selected Transfer Stations within the Study Areas to identify operational measures and design modifications to improve the environmental performance of these facilities, and the third study evaluates the effectiveness of enforcement activities and permitting procedures and criteria of City and state agencies that oversee Transfer Station operations, under existing rules and regulations. Appendices A through K of Volume I provide the details for each of the analyses undertaken.

2.2 Volume II: Commercial Waste Generation and Projections

The Summary Report in Volume II synthesizes the results of five separate evaluations, included as Appendices A through E, which together constitute the basis for determining the quantities of putrescible, non-putrescible and fill material waste generated within the City that is managed by the private sector. Twenty-year projections of this commercial waste stream are presented through the New SWMP Planning Period, which will aid in determining the adequacy of planned facilities.

2.3 Volume III: Converted Marine Transfer Stations – Commercial Waste Processing and Analysis of Potential Impacts

Volume III reports on the capacity required by DSNY at each of the eight Converted Marine Transfer Stations (MTSs) to handle DSNY-managed Waste, and the remaining capacity potentially available to private carters for commercial putrescible waste deliveries at these facilities based upon the results of environmental analyses. These environmental analyses applied City Environmental Quality Review (CEQR) methodologies in evaluating whether that capacity could be utilized without causing potentially unmitigatable adverse impacts. However, the business arrangements, economics, possible regulatory policies, and a number of other significant variables that would be elements of a City policy to attract commercial waste to the Converted MTSs, were not addressed in this report.

As a foundation for the environmental analysis of potential commercial waste processing at these facilities, Appendix A of Volume III, MTS Environmental Evaluation, provides a comprehensive environmental evaluation, based on CEQR methodologies, of processing DSNY-managed Waste from the wasteshed that historically delivered to City MTSs at these locations.

2.4 Volume IV: Evaluation of Waste Disposal Capacity Potentially Available to New York City

Volume IV examines the waste disposal capacity potentially available within seven states (Georgia, New York, New Jersey, Ohio, Pennsylvania, South Carolina and Virginia) for accepting City waste, either via truck transfer or by barge or rail. Historic market price information was also gathered and reviewed.

2.5 Volume V: Manhattan Transfer Station Siting Report

Volume V investigates and evaluates potential sites for locating new truck-to-barge or truck-to-rail transfer stations in Manhattan, since no private putrescible waste Transfer Stations are located in this borough.

2.6 Volume VI: Waste Vehicle Technology Assessment

Volume VI reports on a survey of alternative fuels, new engine technologies and vehicle emission retrofit options that are appropriate for use on waste collection vehicles and profiles the innovative DSNY programs and initiatives implemented to evaluate alternative fuels, engine technologies and retrofit options. This volume provides an assessment of the advantages and disadvantages of the various options to reduce consumption of fossil fuels and/or reduce vehicle emissions, and recommends cleaner technologies, including technologies that DSNY had previously tested and, in some cases, targeted for implementation.

3.0 CONSOLIDATED EXECUTIVE SUMMARIES

3.1 Volume I: Private Transfer Station Evaluations

Privately owned and operated commercial waste Transfer Stations play a vital role in the City's solid waste management system. Putrescible Transfer Stations currently transfer approximately 6,200 tons per day (tpd)⁴ of commercial waste and 7,250 tpd of DSNY-managed Waste disposed by City residents, agencies and not-for-profit institutions to disposal facilities outside the City. Non-putrescible and fill material Transfer Stations play a similarly important role in the recycling and disposal of C&D debris and excavation material, with approximately 8,630 tpd and 19,070 tpd handled at these facilities in 2003, respectively. While critical to the City's waste infrastructure, these facilities must operate and be maintained in an environmentally sound manner, and in accordance with City and state rules and regulations. This volume consists of three independent but inter-related studies on Transfer Stations located throughout the City that examine the effects of geographical proximity in four Study Areas, assess whether the enforcement of existing regulations and the permitting procedures and criteria are effective, and recommend practical means to improve the operation of these facilities which may impact upon the quality of life in the surrounding communities.

It is important to note in this Study that DSNY's MTS Conversion Program relies on shipping DSNY-managed Waste by barge and rail, and so is expected to reduce the numbers of trucks currently hauling DSNY-managed waste from private Transfer Stations for disposal. Moreover, DSNY has taken the initiative to issue three Requests for Proposals (RFPs) solicitations to private vendors that may result in the award of a contract that would have the effect of reducing transfer trailer truck traffic associated with the transport of commercial waste in the Study Areas. Specifically, DSNY long-term export RFPs seek vendor proposals to containerize DSNY-managed Waste at private transfer facilities and transport it out of the City by barge or rail. These RFPs seek alternatives to the rebuilding of the Greenpoint and Bronx MTSs, and a contract entered into by the City would specify that all waste (not just DSNY-managed Waste)

⁴ Tons per day are calculated on the basis of a six-day week, 312-day year.

accepted at Transfer Stations on which proposals are based be containerized and transported out of the City by barge or rail. This would have the potential effect of significantly reducing the volume of outbound traffic from Transfer Stations in portions of Brooklyn, Queens and the Bronx.

The approach taken and findings for each of these studies is summarized below.

3.1.1 Four Study Areas with Transfer Stations in Geographical Proximity

3.1.1.1 Scope of Analysis/Approach

The objective of the Study Area analysis was to evaluate whether areas with a number of Transfer Stations in geographical proximity have the potential of producing overlapping environmental effects on air quality, odor, noise, neighborhood character and water quality. In addition, the off-site effects of these facilities on traffic, air quality and noise from mobile sources (Waste Hauling Vehicles) were analyzed. The potential public health effects of the findings of these evaluations were also considered.

The Study Areas were selected based upon a review of the location and geographical proximity of the 69 operating private Transfer Station in the five boroughs. (See Footnote #2.) Four Study Areas encompassing 43 of the facilities were identified for analysis: Port Morris, Bronx CD #1; Hunts Point, Bronx CDs #2 and #9; Jamaica, Queens CD #12; and Brooklyn CD #1 (primarily East Williamsburg, but including three facilities with four permits in Queens). Table ES-1 shows the name, location and type of Transfer Station in each Study Area.

First, current conditions (including the presence of the Transfer Stations) in each of the Study Areas were evaluated. Second, the conditions without the Transfer Stations were evaluated to determine the net contribution of the Transfer Stations. Third, the conditions without the Transfer Stations, but with assumed other industrial uses occupying the same sites, were evaluated assuming the Transfer Stations were replaced by as-of-right general light industrial land uses (e.g., printing plants, laboratories) in the Study Area. This land use replacement scenario assumed that the Transfer Station land uses would be occupied by other M-zone land

**Table ES-1
Permitted Commercial Waste Transfer Stations within Study Areas**

Name	Address	Type Of Transfer Station
Port Morris, Bronx CD #1		
Bronx County Recycling	475 Exterior Street	Fill
Felix Equities	290 East 132 nd Street	Fill
Tilcon NY	980 East 149 th Street	Fill
USA Waste Services of NY (Waste Management)	98 Lincoln Avenue	Putrescible
USA Waste Services of NY (Waste Management) ⁽¹⁾	132 nd Street & Saint Ann's Avenue	Putrescible (Intermodal)
Waste Services of NY	920 East 132 nd Street	Putrescible
Total Number in Port Morris, Bronx CD #1 Study Area		6
Hunts Point, Bronx CDs #2 and #9		
A.J. Recycling	325 Faile Street	Non-Putrescible
Bronx City Recycling	1390 Viele Avenue	Fill
G. M. Transfer	216-222 Manida Avenue	Non-Putrescible
Kids Waterfront Corp.	1264 Viele Avenue	Non-Putrescible
IESI NY Corp	325 Casanova Street	Putrescible
John Danna and Sons	318 Bryant Avenue	Non-Putrescible
Metropolitan Transfer Station	287 Halleck Street	Putrescible
Paper Fibers Corp.	960 Bronx River Avenue	Putrescible
Waste Management of NY ⁽¹⁾	Oak Point & Barry Avenue	Putrescible (Intermodal)
Waste Management of NY	620 Truxton Street	Non-Putrescible
Waste Management of NY	315 Baretto Street	Non-Putrescible
Total Number in Hunts Point, Bronx CDs #2 and #9 Study Area		11

Table ES-1 (Continued)
Permitted Commercial Waste Transfer Stations within Study Areas

Name	Address	Type Of Transfer Station
Brooklyn CD #1		
Point Recycling Ltd	686 Morgan Avenue	Non-Putrescible
Waste Management of NY ⁽²⁾	75 Thomas Avenue	Non-Putrescible
Waste Management of NY ⁽²⁾	485 Scott Avenue	Putrescible
Waste Management of NY	215 Varick Avenue	Putrescible
Waste Management of NY	123 Varick Avenue	Non-Putrescible
Waste Management of NY	232 Gardner Avenue	Non-Putrescible
Maspeth Recycling ⁽³⁾	58-08 48 th Street	Fill
IESI NY Corp	548 Varick Avenue	Non-Putrescible
Astoria Carting Company ⁽³⁾	538-545 Stewart Avenue	Non-Putrescible
City Recycling Corp	151 Anthony Street	Non-Putrescible
Cooper Tank and Welding	222 Maspeth Avenue	Non-Putrescible
Pebble Lane Associates ⁽³⁾	57-00 47 th Street	Fill
Keyspan Energy	287 Maspeth Avenue	Fill
New Style Recycling Corp ⁽²⁾⁽³⁾	49-10 Grand Avenue	Putrescible
New Style Recycling Corp ⁽²⁾⁽³⁾	49-10 Grand Avenue	Non-Putrescible
BFI Waste Systems of NJ ⁽⁴⁾	598-636 Scholes Street	Putrescible
BFI Waste Systems of NJ ⁽⁴⁾	594 Scholes Street	Non-Putrescible
BFI Waste Systems of NJ ⁽⁴⁾	575 Scholes Street	Non-Putrescible
BFI Waste Systems of NJ	115 Thames Street	Putrescible
Hi-Tech Resource Recovery	130 Varick Avenue	Putrescible
Total Number in Brooklyn CD #1 Study Area		20

Table ES-1 (Continued)
Permitted Commercial Waste Transfer Stations within Study Areas

Name	Address	Type Of Transfer Station
Jamaica, Queens CD #12		
American Recycling Management ⁽²⁾	172-33 Douglas Avenue	Putrescible
American Recycling Management ⁽²⁾	172-33 Douglas Avenue	Non-Putrescible
Regal Recycling ⁽²⁾⁽⁵⁾	172-06 Douglas Avenue	Putrescible
Regal Recycling ⁽²⁾⁽⁵⁾	172-06 Douglas Avenue	Non-Putrescible
T. Novelli ⁽²⁾	94-07 Merrick Avenue	Fill
T. Novelli ⁽²⁾	94-20 Merrick Avenue	Non-Putrescible
Total Number in Jamaica, Queens CD #12 Study Area		6
Total Number of Transfer Stations Evaluated		43

Notes:

- ⁽¹⁾ These two facilities are permitted as intermodal terminals that ship containerized waste by rail. No waste processing is conducted at these sites.
- ⁽²⁾ Denotes one facility with two permits.
- ⁽³⁾ Four Transfer Stations on the Brooklyn CD #1 list are actually in Queens near the border of Brooklyn but were evaluated as part of the Brooklyn CD #1 Study Area.
- ⁽⁴⁾ These three locations constitute one facility with three DSNY permits under state regulations.
- ⁽⁵⁾ Regal Recycling is enclosing the non-putrescible waste processing operations; therefore, this facility was modeled as an enclosed non-putrescible Transfer Station.

uses typical of current conditions in the Study Area. The off-site effects of these replacement land uses were calculated using trip generation rates published by the Institute of Transportation Engineers (ITE).

Analyses were conducted for: (1) air quality, odor, noise, neighborhood character, public health and water quality from Transfer Stations located within each Study Area; and (2) traffic, off-site air quality and off-site noise at key intersections/locations along major corridors leading to and from the Study Areas. Although this evaluation is not an environmental review, it uses CEQR and other planning and engineering review criteria as the best available measure of the environmental effects of Transfer Stations on the surrounding community. Standard models for air quality (United States Environmental Protection Agency [USEPA]-approved Industrial Source Complex Short Term [ISCST3], CAL3QHCR, MOBILE5b and Part 5), noise (Federal Highway Administration's [FHWA's] Traffic Noise Model [TNM] 2.1) and traffic (Highway Capacity Software [HCS] version 4.1c) were used to predict combined effects of the Transfer Stations.

Criteria were identified for each environmental parameter, as described in the “Summary Report on Four Study Areas with Transfer Stations in Geographical Proximity.” If the criteria were not exceeded, the Study Area analysis concludes that the overlapping effects of the Transfer Stations were not considered to be adverse. If these criteria were exceeded, means of reducing environmental effects through operational measures or design modifications were identified and then evaluated. If the current conditions for traffic and its attendant effects still exceeded the applicable criteria, further analysis was undertaken, as more fully described in the Summary Report.

3.1.1.2 Findings and Recommendations

Air quality, odor, noise, traffic, neighborhood character and water quality analyses were conducted to evaluate the potential effects from the geographic proximity of the Transfer Stations within the Study Areas. The analyses modeled areas where the potential effects of Transfer Stations in proximity to each other overlapped (combined effects) and evaluated whether these effects were potentially adverse. It considered combined effects at sensitive receptors in these areas of overlap in manufacturing zones -- for example non-conforming residences, not just contiguous residential zones -- but did not consider new siting actions. The overall results of the Study Area analyses show that the geographical proximity of the existing Transfer Stations in these Study Areas do not cause adverse combined or cumulative effects using reasonable criteria adapted from the CEQR and planning and engineering criteria. There are no findings in the Study Area analyses that indicate there are combined adverse effects to the environment from existing Transfer Stations that would warrant a reduction in the number and capacity of Transfer Stations in the Study Area.

The Study makes certain recommendations for, among other things, better odor control systems at putrescible Transfer Stations to improve the operations and to limit the effects of Transfer Stations. As described in the Volume I, Summary Report, the regulatory regime for siting of new Transfer Stations in the City consists of zoning, operating requirements, siting restrictions, environmental review, the state’s detailed Part 360 regulations, the City’s Noise and Air Codes, and Vehicle and Traffic Laws. Together the application of these current requirements would tend to mitigate the potential for adverse impacts from a future siting action.

1. ***On-site Air Quality:*** The maximum predicted combined contribution of existing Transfer Stations in the Study Area combined with background levels from the closest air quality monitor showed results all below National Ambient Air Quality Standards (NAAQS) for criteria pollutants (carbon monoxide [CO], sulfur dioxide [SO₂], nitrogen dioxide [NO₂] and particulate matter less than 10 microns in diameter [PM₁₀]). For particulate matter less than 2.5 microns in diameter (PM_{2.5}), the maximum predicted annual neighborhood average from combined on-site and off-site sources ranges from 1% to 6% of contribution to the latest monitored concentration from the nearest monitoring station within each Study Area.

2. ***On-site Odor:*** Sampling of odors was undertaken in the summer when odor generation from waste decomposition would be at its highest. A review of the controlled and uncontrolled odor emissions from the same facilities revealed that the controlled Transfer Station emissions were no more than 38% lower than the uncontrolled facilities, and in some cases the controlled emissions were deemed higher than the uncontrolled emissions, which is most likely due to the use of scented masking agents instead of more effective neutralizing agents to control odors. The highest frequency of conservatively predicted odor levels exceeding the criteria, assuming no odor controls, was for a receptor in the Brooklyn CD #1 Study Area, where the model predicted an exceedance just under 0.82% of the time (72 non-consecutive hours per year). If more effective (90% efficient) odor controls were implemented at all commercial putrescible waste facilities, the odor levels would be reduced substantially (by 90%), and there would be no overlapping contributions from multiple Transfer Stations in the Study Areas.

3. ***On-site Noise:*** Transfer Stations in the Port Morris, Bronx CD #1 Study Area do not have overlapping noise effects because they are not located in close proximity to each other. However, there were areas of potential overlapping effects from multiple Transfer Stations in Brooklyn CD #1; Jamaica, Queens CD #12; and Hunts Point, Bronx CDs #2 and #9 Study Areas, but the analyses did not predict effects at sensitive receptors located within these Study Area overlap areas. Waste Hauling Vehicles queuing on and off site make the greatest contributions to noise levels. The removal of off-site queuing of Waste Hauling Vehicles reduces noise levels attributable to overlapping effects.

4. **Traffic:** Fifty-eight (58) intersections were analyzed in the Study Areas for the traffic analysis. Results indicate that many of the intersections operate at an overall level of service (LOS) C or better under current conditions (six in Port Morris, Bronx CD #1 Study Area; seven in Hunts Point, Bronx CDs #2 and #9 Study Area; 16 in Jamaica, Queens CD #12 Study Area and 23 in Brooklyn CD #1 Study Area). The current conditions at six of the intersections in the Study Areas operate at an overall LOS D, E or F.⁵ The percentage of Waste Hauling Vehicles analyzed ranged from 0% to 7% of the total number of vehicles traveling through the intersections during the hours analyzed. Subtracting the Waste Hauling Vehicles from the analysis did not significantly improve the LOS at any intersection analyzed. And when replacement industry trips (that is, traffic that would be generated by other light industrial uses for the Transfer Station sites if the Transfer Stations were absent) were substituted for Waste Hauling Vehicles in the analysis, the LOS remained the same or deteriorated.

5. **Off-site Air Analysis:** For the mobile air quality analyses, current conditions were analyzed at two “worst case” links each in the Port Morris, Bronx CD #1 and the Hunts Point, Bronx CDs #2 and #9 Study Areas and at four links each in Brooklyn CD #1 and Jamaica, Queens CD #12. In all instances, results are below NAAQS for all the criteria pollutants. For PM_{2.5}, the 24-hour maximum contribution from off-site emission sources ranged from 0.03 to 1 µg/m³ (or 0.08% to 2.4% of the latest monitored concentration). The annual neighborhood maximum contribution from off-site emission sources ranges from 0.01 to 0.17 µg/m³ (or 0.08% to 0.9% of the latest monitored concentration).

6. **Off-site Noise:** Two levels of screening were conducted on 23 locations where sensitive receptors exist near convergence points along truck routes to and from the Study Areas -- eight in Port Morris, Bronx CD #1; four in Hunts Point, Bronx CDs #2 and #9; six in Brooklyn CD #1; and five in Jamaica, Queens, CD #12. The first level of screening used total traffic volumes and axle factors from the New York State Department of

⁵ Brooklyn CD #1 Study Area: (1) Meeker Avenue and Union Avenue, and (2) Flushing Avenue/Melrose Street and Varick Avenue/Irving Avenue; Port Morris, Bronx CD #1 Study Area: (1) Bruckner Boulevard and Alexander Street; Hunt’s Point, Bronx CDs #2 and #9 Study Area: (1) Hunt’s Point Avenue and Bruckner Boulevard, (2) Longwood Avenue and Bruckner Boulevard, and (3) Leggett Avenue and Bruckner Boulevard.

Transportation (NYSDOT) to conservatively estimate the existing traffic volumes, and whether the addition of Waste Hauling Vehicles would have the potential to double passenger car equivalent (PCE) noise levels, requiring a further evaluation of potential effects (first-level screening).⁶ Based on this first-level screening, 17 locations (five in Port Morris, Bronx CD #1; four in Hunts Point, Bronx CDs #2 and #9; three in Brooklyn CD #1; and five in Jamaica, Queens, CD #12) were identified for further screening (second-level screening) using actual field traffic classification counts at these locations to determine the potential for doubling PCEs. Based on this second-level screening, five locations (two locations in Brooklyn CD #1 and three locations in Jamaica, Queens, CD #12) were identified for modeling using Federal Highway Administration's (FHWA's) Traffic Noise Model (TNM) version 2.1. Predicted results from TNM modeling at these five locations were compared to the Study noise threshold (an increase in 3dBA or greater attributable to the Waste Hauling Vehicles). The modeled mobile noise from the Waste Hauling Vehicles at the intersections analyzed did not exceed the threshold. Therefore, there are no predicted noise effects from these Waste Hauling Vehicles.

7. ***Water Quality:*** Twenty-nine of the 43 Transfer Stations within the Study Areas are not near or adjacent to surface water. The remaining 14 Transfer Stations that are adjacent to or near surface water do not have adverse individual or combined effects on water quality in the Study Areas.

8. ***Neighborhood Character:*** The neighborhood character analyses in all four Study Areas determined that overlapping effects of Transfer Stations, where such effects exist, do not contribute adversely to the typically industrial neighborhood character of the four Study Areas. Moreover, where the technical analyses compared existing conditions to the replacement scenario, in which reasonably anticipated development were assumed to occur in place of the Transfer Stations, it was found that the conditions studied would not necessarily be better than existing conditions. In certain cases, larger volumes of traffic

⁶See Volume I Summary Report for intersection locations.

predicted under the replacement scenario could potentially result in diminished neighborhood character quality, compared to existing conditions with the Transfer Stations. The assumption used in creating the replacement industry scenario is that all components of neighborhood character conditions (zoning, socioeconomics, etc.) remain fundamentally the same as existing conditions.

9. **Public Health:** Using the conservative assumption that commercial waste Transfer Stations do not control odors at all, receptors in two Study Areas were found likely to experience potentially unacceptable odors at times from overlapping effects. These effects were predicted to be infrequent, occurring less than 1% of the time for all receptors (i.e., less than 72 non-consecutive hours per year), and are not likely to generate sustained annoyance or symptoms. With regard to regulated pollutants, cumulative effects on air quality were predicted to be minimal (for PM_{2.5}, 1% to 6% of contribution to the latest monitored background values). The Transfer Stations, in aggregate, do not appear to be important determinants of air quality for any of the pollutants regulated by the USEPA on the basis of human health effects.

3.1.2 Engineering and Operations Survey of Selected Transfer Stations

3.1.2.1 Scope of Analysis/Approach

This report supplemented the work undertaken as part of the Study Area evaluations through on-site surveys of 24 of the 43 Transfer Stations located in the Study Areas, including putrescible, non-putrescible and fill material facilities. These surveys involved a review of existing information made available by DSNY from its permit records and environmental review documents, and site visits to observe facility operations and collect data on facility designs and operating performance. The data collection activities included odor (at existing transfer stations) and noise sampling (at nearby receptors) and analysis. These data were evaluated to determine if various design or operational measures could improve the environmental performance of existing Transfer Stations in terms of a reduction in pollutant and odor emissions and noise attenuation. Details are provided in Appendix J of Volume I.

3.1.2.2 Findings and Recommendations

The following recommendations, pertaining to the design and operation of Transfer Stations, are the result of this evaluation.

1. **Ventilation and Odor Control** – The ventilation systems of putrescible Transfer Stations should be upgraded with the addition of state-of-the-art odor control technology to “neutralize” odors in exhaust air, and ventilation capacity should be increased to prevent the escape of odors when facilities are operating with doors open, by maintaining sufficient negative air pressure. The combination of an odor neutralizing system treating exhaust air in conjunction with increased fan capacity, operated correctly, would have synergistic effects to substantially reduce potential odors.

A number of the putrescible Transfer Stations inspected used rudimentary odor control systems that could be more effective. An example of a state-of-the-art odor control system option is a hard-piped system, suspended above the processing floor, which would introduce an odor-neutralizing agent into exhaust air, as it is ventilated from the building. Implementing this recommendation could include a provision for an equivalent system acceptable to the DSNY Commissioner that is sufficient to meet Zoning Code and Air Code standards.

The fan capacity recommendation would surpass current Building Code standards. It would require increasing fan capacity from 6 air changes per hour (ach) to 8 to 12 ach and treating the exhaust air. Fans would automatically operate at 8 ach with doors closed and at 12 ach with doors open. The additional fan capacity addresses the practical reality that Transfer Station doors are generally open during operating hours when inbound and outbound traffic is heavy and consequently odors can be more readily released from the building.

2. **Odor Prevention** – DSNY’s Permit and Inspection Unit (PIU) staff should continue focusing their enforcement efforts on operating conditions that contribute to odor formation during waste processing operations. Inspectors should take particular care to continue to identify and take enforcement action to correct the following conditions, when observed:

- Floor-wear conditions that contribute to pooling of leachate on the floor. These conditions may be indicated by exposed rebar.
- Excessive dust accumulation on facility walls that can become a source of odor formation.
- Clogged trench drains in the floor drain system or grit and grease traps that are not routinely maintained.

In addition, inspectors should continue to monitor and focus on compliance with a daily ½-hour “clean time” during which the floor is cleared of waste to allow housekeeping functions, such as floor and wall wash-down, cleaning of drains, and maintaining ventilation and odor control systems.

3. **Dust Control** – Both DSNY and New York State Department of Environmental Conservation (NYSDEC) regulations require measures to control dust from waste processing operations. Of the three types of Transfer Stations, non-putrescible and fill material facilities generally operate outdoors, while all waste processing activity at putrescible Transfer Stations must occur in an enclosed building. Dust control should continue to be a focus of PIU’s enforcement action, particularly when dust from operations is observed crossing property lines at non-putrescible and fill material Transfer Stations or exiting from the exhaust vents of putrescible Transfer Stations. Persistent enforcement will induce facility operators to use relatively simple and effective dust control measures.

Different means of controlling dust are applicable to each type of facility:

- Non-putrescible and fill material facilities – Installation of a sprinkler-type system that sprays water on the working pile will substantially reduce the transport of dust from processing operations more effectively than hand-held hoses currently used at many facilities.

- Putrescible – Installation of a water-misting system for dust suppression within the enclosed processing building is an effective method of minimizing dust in the exhaust air. The system commonly used in the solid waste industry involves pumping water through 1/4” to 3/4” steel pipe to high-pressure mist nozzles that atomize water, creating a fine mist that reduces dust generation. The atomization process does not cause water to pool on the processing floor. These systems, when operated properly, are effective at reducing as much as 90% of the dust generated at putrescible Transfer Stations.
4. **Stormwater Control** – This issue is specific to non-putrescible and fill material facilities that do not have concrete paved surfaces with appropriate drainage where material is processed. This absence of pavement with appropriately installed stormwater drainage creates two potential problems: (i) runoff into surface water or storm sewers; and (ii) tracking of mud and debris during wet weather onto neighboring streets.

The first issue is being addressed by NYSDEC under the authority established by Article 27 of the Environmental Conservation Law (ECL) and more specifically by Article 17, Titles 7 and 8 of the ECL. Implementing regulations for Article 17, Titles 7 and 8 are provided under 6 New York Codes, Rules and Regulations (NYCRR) Part 750. These regulations are the basis of the State Pollution Discharge Elimination System (SPDES) program that requires permits for management of stormwater that discharges to surface water or separate storm sewers. Obtaining coverage under the statewide general permit for stormwater associated with industrial activities (GP-98-03) or an individual stormwater permit requires the preparation of a Stormwater Pollution Prevention Plan that would typically entail installation of a paved surface with controlled drainage directed through grit and grease traps or other pretreatment systems prior to discharge to surface waters or storm sewers. Discharge of stormwater containing “leachate” to the sanitary or combined sewer system requires permits from the City Department of Environmental Protection (NYCDEP). NYSDEC is in the process of requiring Transfer Stations in the City to obtain SPDES permits.

The second issue (tracking of mud and debris during wet weather onto neighboring streets) can be effectively addressed by washing the tires of vehicles as they exit the Transfer Station. This can be accomplished through the installation of an automated tire washing system or using manually operated hoses.

5. **Noise Control** – Noise emissions are regulated under the City’s Noise Code §24-243, the Zoning Resolution and Transfer Station Operating Rules. Noise effects may arise at the property boundary where equipment operates outdoors, as is the case with non-putrescible and fill material Transfer Stations (waste processing operations at putrescible Transfer Stations are in an enclosed building), or from Waste Hauling Vehicles queuing in the street in front of these facilities (which was found to be the principal source of noise at Transfer Stations.) However, the Noise Code and Zoning Code do not prohibit the levels of vehicular noise associated with queuing trucks at Transfer Stations. Also, space limitations at many existing facilities limit the options for mitigating this problem. DSNY’s operating rules prohibit non-putrescible Transfer Stations from operating between 7:00 p.m. and 6:00 a.m., to limit noise from such facilities. NYSDEC, during its permit renewal process, is focusing on design measures and permit conditions to limit off-site queuing. These combined approaches can mitigate noise problems in areas where they are most likely to affect residential dwellings.

6. **Air Quality** – The primary sources of air pollution from Transfer Stations are the non-road engines, such as front end loaders, used in waste processing operations, not diesel Waste Hauling Vehicles. This issue is discussed more fully in the evaluation reports of the four Study Areas. It is important to note here that: (i) these engines will be subject to increasingly stringent emission standards promulgated by the USEPA that over time will significantly reduce emissions as older equipment is replaced; and (ii) federal law appears to preempt the City from establishing more stringent standards for these non-road engines. The New York Air Code (NYAC) §24-143, contains a prohibition on *“visible air contaminants from an internal combustion engine of (a) a motor vehicle while the vehicle is stationary for longer than 10 consecutive seconds; or (b) a motor vehicle after the vehicle has moved more than 90 yards from a place where the vehicle was stationary.”* This regulation provides a basis for enforcement actions by DSNY’s PIU inspectors where old or poorly maintained mobile equipment, such as front end loaders or bulldozers, is emitting visible smoke. Air Code §24-109 and §24-142 provide authority to regulate stationary equipment such as crushers. DSNY should institute a training program for its inspectors in the application of USEPA’s (40 CFR 60,

Appendix A) Method 9 procedures for opacity testing. (The threshold for human recognition of visible emissions is generally considered to be around 5% opacity.) Certified inspectors issuing citations for opacity violations would induce Transfer Station operators to better maintain or upgrade their equipment.

3.1.3 Effectiveness of Enforcement

3.1.3.1 Scope of Analysis/Approach

Both the City and New York State regulate the privately owned Transfer Stations. DSNY is the primary local agency responsible for permitting, regulating and inspecting Transfer Stations and NYCDEP's Environmental Control Board (ECB) adjudicates notices of violation that DSNY officers write. DSNY derives its powers to control waste Transfer Station operation from the City Charter, Title 16, of the New York City Administrative Code (NYCAC) and Title 16 of the Rules of the City of New York (RCNY). The New York State Department of Environmental Conservation (NYSDEC)'s regulatory authority derives from the Environmental Conservation Law (ECL) and Title 6 of NYCRR, Part 360. The Business Integrity Commission (BIC) does background investigations into character and fitness to operate a Transfer Station and also licenses the vehicles operated by private carters in the City.

As the primary inspector of the City's Transfer Stations, DSNY's PIU conducts most of the on-site inspections. The unit is comprised of twenty-two (22) officers -- 17 Environmental Police Officers and five Environmental Lieutenants. The PIU force conducts a full inspection of each putrescible and non-putrescible Transfer Station at least once per week, and conducts additional, frequent, limited drive-by inspections of such facilities.

During the course of this Study, current management policies governing the City's Transfer Stations were reviewed and evaluated based on infraction statistics gathered from the inspection records at DSNY and NYSDEC to determine the effectiveness of enforcement procedures on the City's Transfer Stations. In addition, other City and state agencies involved with various aspects

of enforcement were contacted and the rules and regulations defining their authority reviewed. Details of these analyses can be found in Volume I, Appendix K, Effectiveness of Enforcement. In addition, a review of historical violation records from 1991 to 2002 was completed as well as an in-depth study of inspection reports for Fiscal Year 2003. The pattern of violation issuance and the type of infraction that led to such summonses were evaluated to gain a better understanding of current enforcement measures and to address potential improvements to the system.

Various fine structures exist depending on the type, severity and frequency of a violation. Certain Transfer Station-type violations, such as operating a Transfer Station without a valid permit or being in violation of operational rules, are termed “major ECB violations” for the purpose of this Study and warrant a fine ranging from \$2,500 for a first offense, \$5,000 for a second offense and up to \$10,000 for third and subsequent offenses. Violations that this Study terms “minor ECB violations” relate to sidewalk and street infractions and have lower liability amounts that warrant fines between \$100 and \$300, while the Study category of “minor action violations,” such as illegal dumping or the presence of noxious liquids, has a maximum fine of up to \$450. (The “minor” classification used here is not meant to suggest that such violations are less important, merely that the monetary penalties are less than those for “major” Transfer Station violations.)

City enforcement of regulatory standards on Transfer Station operation is guided by the applicable performance standard for the facility under the Zoning Resolution, as supplemented by the Air and Noise Code and DSNY’s regulations. The City has established three kinds of industrial districts, each with specific performance standards: Light Manufacturing (M1 - High Performance), Medium Manufacturing (M2 - Medium Performance) and Heavy Manufacturing (M3 - Low Performance). Transfer Stations are considered a Use Group 18 use. Use Group 18 uses are appropriate in M3 districts subject to low performance standards, and are allowed in M1 and M2 districts provided they meet the more stringent performance standards applicable to those zones with respect to odor, noise, vibration, dust and smoke. Additional noise and vibration restrictions apply to a manufacturing district located adjacent to a residential district. M1 districts often serve to buffer residential and commercial districts from heavier industrial M2 or M3 zones. M2 districts occupy the middle ground between light and heavy industrial areas. Performance standards in this district are less stringent than in M1 areas, as more noise, vibration

and smoke are permitted. M3 districts are designated for heavy industries (such as foundries, cement plants, salvage yards, chemical manufacturing, asphalt plants) that generate more objectionable influences and hazards, including noise, dust, smoke and odors, as well as heavy traffic. New residences and community facilities may not locate in M3 districts. These districts are usually situated near the waterfront and are buffered -- for example by M1 districts -- from residential areas. With their low performance standards, M3 zones are particularly well-suited for the siting of Transfer Stations

A field observation was conducted to sample the level of compliance with truck route restrictions around Transfer Stations. Trucks must travel on designated routes, except where they deviate to reach their final destination. Truck route violations are important to monitor as they directly affect the quality of life on residential streets in the surrounding community. (The City Department of Transportation [NYCDOT] is currently conducting a Citywide study of truck traffic.) The survey counted Waste Hauling Vehicles using non-truck routes at key intersections in the vicinity of Transfer Stations and compared their number to the number of other trucks and automobile traffic. Intersections with a high potential to be used illegally by Waste Hauling Vehicles -- either key local non-truck route intersections or crossings of local arteries and truck routes -- were selected as observation sites.

3.1.3.2 Findings

1. Only approximately 0.3% to 6% of total traffic at a non-truck route intersection can be attributed to Waste Hauling Vehicles.
2. There has been a 100% increase in DSNY inspection frequency over the last four years following a doubling in inspection staff and an increase in the closure of negligent facilities. In general, the number of Transfer Stations has declined. In 1990, 153 Transfer Stations were in operation, compared to 96 in 1996 and only 69 in 2004.
3. According to DSNY historical summons data, over the past 12 years (1991 to 2002), roughly 15% of putrescible Transfer Stations, 12% of non-putrescible Transfer Stations and 8% of fill material Transfer Stations accrued more than 20 violations each in the 12-year span.

4. The majority of the City's Transfer Stations are sited in M3 zones (68%), thus reducing their potential effect on the residential community.
5. In 1998, DSNY promulgated new Transfer Station Siting Rules (implemented as a new subsection of the existing rules governing Transfer Stations found in 4 RCNY 16) that included restrictions on the locations in which new Transfer Stations could be sited and limitations on their hours of operation. They included the following general provisions:
 - No siting of new putrescible and non-putrescible Transfer Stations in M1 zones;
 - No siting within 400 feet of residential districts and sensitive receptors such as public parks and schools;
 - No siting of a new non-putrescible Transfer Station within 400 feet of an existing non-putrescible Transfer Station; and
 - No operating of non-putrescible Transfer Stations in an M1 zone between 7:00 p.m. and 6:00 a.m.

Additionally, the rules required Transfer Stations to submit engineering reports and transportation plans with all permit applications. These requirements mean that new facilities would be less likely to be in a location that impacts local residents. The rules apply to applications filed after October 1998, and so did not apply to certain pending applications. Additionally, DSNY promulgated temporary siting restrictions in 2003 that expire later this year and will promulgate new permanent Siting Rules this year.

6. On average, seven "major" DSNY violations were issued at Transfer Stations each month between July of 2002 and June of 2003, and roughly 30 major violations were issued to each type of Transfer Station. Despite the fact that fill material inspections occur much less frequently, fill material violations accounted for roughly 29% of the violations issued by DSNY to Transfer Station operators between July 2002 and June 2003. Putrescible Transfer Stations had the most violations, accounting for 45% of those issued; non-putrescible Transfer Stations accounted for only 26%.
7. According to DSNY violation statistics, on average, 50 "minor" Environmental Control Board (ECB) violations, 351 parking violations and 51 traffic violations were issued per month between July 2002 and June 2003. With an annual count of 5,505 summonses, DSNY issues approximately 460 violation summonses of varying severity each month.

8. According to DSNY statistics for Fiscal Year 2003, pile height/volume over the limit was the most common violation at non-putrescible Transfer Stations; and operating without a permit was the second most common violation. The most common violation reported at putrescible Transfer Stations was an unclean tipping floor.
9. Ten violations were issued by DSNY in Fiscal Year 2003 to persons unlawfully operating a fill material Transfer Station without a permit. This violation results in closing an illegal operation.
10. Spillage from trucks and/or receptacles is a relatively frequent violation. Illegal dumping by both the owner and operator are also relatively common violations issued by DSNY. Causing a street obstruction and the presence of noxious liquids were also reported frequently.
11. The majority of parking violations issued by DSNY are in response to trucks standing or parking without proper equipment, or having a detached trailer. Parking for over three hours in a commercial zone or parking in the wrong direction are also relatively common violations. The transportation of loose cargo without a cover is the most commonly violated traffic rule, with 300 summonses issued by DSNY within Fiscal Year 2003.

3.1.3.3 Conclusions and Recommendations

In summary, Transfer Station enforcement quality has shown major improvements over the last decade due to the increased frequency of inspections. However, further improvements can be made to improve the level of coordination within and between the City agencies responsible for enforcement, by creating a fully computerized system of inspection forms at the agency level. The improvements in productivity over manual collection and input of inspection data, as well as the overall benefit of a multi-agency coordinated enforcement structure, greatly justifies the investment of resources to create this system. An accessible digital database that will heighten inter-agency cooperation and improve information management is the critical path to improving enforcement practices.

3.2 Volume II: Commercial Waste Generation and Projections

Volume II: Commercial Waste Generation and Projections, reports the results of five different evaluations. The reports and appendices providing the analyses and data in support of this Executive Summary are:

Summary Report on Commercial Waste Generation and Projections

Appendices:

A: Facilities Estimate of Putrescible Waste Generation Year 2002

B: Employment-Based Estimate of Putrescible Waste Generation Year 2002

C: Commercial Putrescible Waste Disposed and Recycled: BIC-DSNY Carter Survey

D: Commercial Putrescible Waste 20-Year Forecast

E: Non-Putrescible Commercial Waste Quantification and Projections

This volume examines the quantities of waste generated within the City that is collected and managed by private carters, i.e., the commercial waste stream. DSNY regulates⁷ putrescible, non-putrescible and fill material Transfer Stations that are permitted to receive and process these categories of waste materials. The NYSDEC also regulates⁸ the design, construction and operation of Transfer Stations.

3.2.1 Scope of Analysis/Approach

The Study employed three different methodologies to develop independent estimates of commercial putrescible waste quantities for the years 2002 and 2003, as described in Appendix A (Facilities Estimate of Putrescible Waste Generation Year 2002), Appendix B (Employment-Based Estimate of Putrescible Waste Generation Year 2002), and Appendix C

⁷ DSNY's regulatory authorities derive from Titles 16, 17 and 25 of the NYCAC, Title 16 of RCNY and the CEQR Procedures.

⁸ NYSDEC's regulatory authority derives from Title 6 of NYCRR Part 360 and Title 6 NYCRR Part 617 under the state's Environmental Conservation Law (ECL).

(Commercial Putrescible Waste Disposed and Recycled: BIC-DSNY Carter Survey) of Volume II. The independent estimates were compared for reasonableness to the data obtained through DSNY's Quarterly Transfer Station Report system (Quarterly Reports). Quarterly Reports are required to be completed by DSNY-regulated Transfer Station operators/owners. The Quarterly Reports do not account for all of the commercial waste generated in the City. Waste not reflected in the Quarterly Reports includes waste that is disposed out-of-City or recycled commercial waste that does not pass through the City's network of private Transfer Stations. The waste quantity estimates developed from the other estimation methodologies corroborated the Quarterly Report data for quantities processed at City Transfer Stations.

All these data sources were used to establish a new, year 2003 baseline estimate inclusive of the total commercial putrescible waste generated, i.e., disposed in and out of the City, and recycled. The new baseline year 2003 estimate accounts for the job loss effects of 9/11 and the subsequent economic recession, and therefore provides a sound starting point for projecting waste generation for the New SWMP Planning Period.

These data sources were also compared to the year 2000 waste quantity estimates in the Preliminary Report (which did not include recycled material) and used as a basis for adjusting Preliminary Report estimates of putrescible waste disposed to eliminate inconsistencies in waste-type definitions and carter classifications, and to establish a revised year 2000 estimate of 8,381 tpd disposed. Comparing the year 2000 estimate of putrescible waste disposed with the 2003 total net disposed (based on three quarters of DSNY Quarterly Reports and direct export totals estimated from the BIC-DSNY carter survey), shows a decline of 1,131 tpd, or 13.5%, in putrescible waste disposed over that period of time.

The *Facilities Estimate* (Appendix A) relies upon DSNY's Quarterly Reports for data on waste quantities delivered to Transfer Stations in the City in 2002. Through an extensive survey effort, new data were collected on waste carted out-of-City for disposal and also on recycled waste from commercial sources in the City that was processed in or out of the City or directly exported to foreign sources. Approximately 31% of the City's commercial putrescible waste was recycled in 2002.

The *Employment-Based Estimate* (Appendix B) used post-9/11 estimates of City employment that reflected the effects of the economic recession on employment, and relied on waste generation factors for commercial business sectors developed through a literature search. These data were used to estimate citywide waste generation for the year 2002 as a function of employment in the City.

The *BIC-DSNY Carter Survey* (Appendix C) assembled information from a survey of the City's licensed carting industry conducted in the fall of 2003. The surveys collected from all carters collecting in the City and followed up in person or via phone interviews, developed data that resulted in an estimate of commercial putrescible waste disposed and recycled in 2003 that included the quantities processed at in-City and out-of-City locations and quantities collected for recycling. Approximately, 27% of the City's commercial putrescible waste was recycled in 2003, a decline of 4% from the prior year. This decline is consistent with nationally reported data on paper markets.

The 2003 baseline waste estimate was allocated among the five boroughs using collection route data obtained from the BIC-DSNY carter survey. Based on this borough allocation, and using projected employment over this period, the quantity of commercial waste generated (both disposed and recycled) was forecast for the New SWMP Planning Period, for each borough. The relative proportions of waste generated by each borough change as a function of changes in projected employment over time. The forecast assumes that the percentage of materials recycled by each borough, would remain constant at 2003 levels for the New SWMP Planning Period. These projections are discussed in Appendix D: *Commercial Putrescible Waste 20-Year Forecast*.

Quantities of non-putrescible waste, which include C&D debris and fill material, were estimated based upon waste generation rates derived from a literature search for three types of residential and commercial construction projects: new construction, demolition and renovation. A regression analysis of data obtained from F.W. Dodge on actual and projected construction activity in the City in each of these respective areas over the period of 2000 to 2007 was used to develop projections of the generation of C&D waste over the New SWMP Planning Period. Non-building-related C&D, which would include clean fill, was estimated by obtaining waste

generation factors expressed as tons per \$1,000 of activity. These factors were applied to the value of this construction in the City obtained from F.W. Dodge. Details of these estimates are discussed in Appendix E: *Non-Putrescible Commercial Waste Quantification and Projections*.

The estimates of commercial putrescible and non-putrescible waste are relevant in determining the Transfer Station capacity required to serve the City's businesses over the next 20 years.

3.2.2 Findings

- In 2003, approximately 3,085,370 tons, or 9,889 tpd, of putrescible waste and 8,640,840 tons, or 27,695 tpd, of non-putrescible waste and clean fill material were generated by the commercial sector in the City. Quantities of waste generated include that which is disposed and recycled.
- In 2003, approximately 6,209 tpd of commercial putrescible waste⁹ were processed for disposal at in-City Transfer Stations and 1,039 tpd were processed at out-of-City facilities. (Although some material is recycled at putrescible Transfer Stations, the vast majority is material destined for disposal.) An estimated 2,641 tpd were recycled directly. The quantities processed out-of-City represent a 21% increase over 2002.
- Of the total commercial putrescible waste generated, 42% is generated in Manhattan¹⁰, 19% in Brooklyn, 13% in the Bronx, 20% in Queens and 5% in Staten Island.¹¹
- Overall, approximately 27% of the commercial putrescible waste was recycled in 2003.
- Quantities of commercial putrescible waste generated are anticipated to increase to approximately 3,414,000 tons, or 10,940 tpd by 2024, which represents an annual average rate of increase of 0.5%.
- Quantities of non-putrescible commercial waste and clean fill are more difficult to predict in the future due to the variability in generation from year to year, but are anticipated to range from approximately 8.0 to 10.9 million tons, (25,640 to 34,810 tpd), by the end of the New SWMP Planning Period.
- The City's commercial putrescible waste (disposed and recycled) is collected by approximately 124 licensed carters.

⁹ These quantities do not include DSNY-managed Waste processed at in-City Transfer Stations.

¹⁰ Sixty-one percent (61%) of the City's jobs are located in Manhattan.

¹¹ Numbers may not add due to rounding.

3.3 Volume III: Converted Marine Transfer Stations – Commercial Waste Processing and Analysis of Potential Impacts

3.3.1 Scope of Analysis/Approach

LL74 requires the Study to consider whether the City's MTS system could accommodate commercial waste as well. When LL74 was adopted, the concept of developing an MTS Conversion Program for containerizing waste for long-term export was not established as a policy objective of the City. Given this policy objective, addressing the issue of processing commercial waste at the Converted MTSs first required, as a foundation, an environmental review of the potential impacts associated with processing DSNY-managed Waste at the new facilities. That environmental review, using CEQR methodologies, is reported in Volume III, Appendix A, MTS Environmental Evaluation, to this report. It concludes that the DSNY-managed Waste generated in the wastesheds that historically delivered to the MTS system can be containerized for export without causing potentially unmitigatable significant adverse environmental impacts. The next step was to analyze what impacts would result from the potential delivery of commercial putrescible waste to the Converted MTSs.

It is important to emphasize that this assessment focuses solely on environmental considerations. It should not be interpreted as a general conclusion that export of commercial waste through the Converted MTSs is feasible. Some of the additional factors that bear on the issue of feasibility that are not addressed in this report are:

- The economics of export through the MTSs, which will be determined in part by proposals from private vendors for transport and disposal of containerized waste from the Converted MTSs. The City has just received and begun evaluating these proposals. Thus the economics of commercial waste export through the Converted MTSs is not yet known.
- The types of business arrangements that the City would enter into with carters for exporting commercial waste through the MTSs are not yet defined.
- Whether further development of the designs for the Converted MTSs will substantiate the operational assumptions or necessitate that the assumed operational capacity be reduced.

- The comparative cost of exporting through the existing private Transfer Stations could be more attractive.
- The potential permit limitations that NYSDEC may place on the operation of the Converted MTSs.
- The location of some MTSs in relation to the sources of commercial waste generation may not provide the same efficiencies and consequently be as attractive to private carters as delivering to private Transfer Stations.

The evaluation of processing commercial putrescible waste at the Converted MTSs is an incremental analysis, complying with the CEQR procedures, that builds on the foundation of the Volume III, Appendix A, MTS Environmental Evaluation report. The analysis of the potential on-site-related impacts associated with processing DSNY-managed Waste is based on the design capacities of the Converted MTSs and concluded that there were no unmitigatable significant adverse impacts. Since commercial putrescible waste deliveries would not exceed these facility design capacities, the potential processing of some quantities of the City's commercial putrescible waste would not cause any incremental significantly adverse impacts attributable to on-site operations.

The analysis of off-site impacts associated with processing putrescible commercial waste required an incremental environmental review of the potential for on-site air quality and off-site (mobile) air quality and noise impacts attributable to delivery of such commercial waste.

The starting point in evaluating the potential capacity available for commercial putrescible waste was defining a scenario for DSNY's capacity requirements that reserved the block of time from 8:00 a.m. to 8:00 p.m. for processing DSNY-managed Waste and assumed that deliveries of DSNY-managed Waste during the 8:00 p.m. to 8:00 a.m. period would have priority over deliveries of commercial waste. Table ES-2 summarizes:

- The design capacity in tpd that each Converted MTS is capable of processing under a normal operations scenario;
- The capacity reserved for DSNY-managed Waste; and
- The potential available excess capacity at each of the Converted MTSs.

The column showing DSNY-managed Waste reserved capacity reflects the historical average peak day generation in the respective MTS wastesheds. Under conditions of high peak generation, the MTSs can be operated to process DSNY-managed Waste in excess of the tpd quantities shown in the table.

**Table ES-2
DSNY-managed Waste Reserved Capacity Scenario**

Converted MTS Facility	Converted MTS Design Capacity⁽¹⁾ (tpd)	DSNY-managed Waste Reserved Capacity (tpd)	Excess Capacity, 8:00 a.m. to 8:00 p.m. (tons)	Excess Capacity, 8:00 p.m. to 8:00 a.m. (tons)
West 135th Street	4,290	1,180	1,211	1,853
East 91st Street	4,290	880	1,227	2,183
West 59th Street ⁽²⁾	2,145	880	279	956
South Bronx	4,290	2,190	333	1,732
North Shore	4,290	2,370	622	1,000
Greenpoint	4,290	2,360	575	1,145
Hamilton Avenue	4,290	2,170	630	1,337
Southwest Brooklyn	4,290	1,090	1,418	1,725
Totals	32,175	13,120	6,295	11,931

Notes:

⁽¹⁾ Based on operating MTSs under normal operating conditions. Spare operating lines are not used to process waste.

⁽²⁾ West 59th Street is a lift and load operation, not an open top-loading slot system.

tpd = tons per day

Given the DSNY-managed Waste Reserved Capacity Scenario, a Commercial Waste Capacity Scenario was defined to determine the potential available capacity that could be used by private carters delivering waste from commercial sources. This scenario identified the potential available capacity on an hourly basis at each Converted MTS, and provided the basis for evaluating the potential on-site air quality, off-site air quality and off-site noise impacts associated with the delivery of commercial waste in nighttime hours. The maximum capacity potentially available for processing commercial waste was evaluated with a spreadsheet model that incorporates both Converted MTS design and operating parameters developed by the DSNY's Consultant design team and arrival profiles for DSNY-managed Waste. It is assumed that, between the hours of 8:00 p.m. and 8:00 a.m., both DSNY-managed Waste and commercial waste could be received and processed at the Converted MTSs. Table ES-3 summarizes the

results of this evaluation. As shown in the “Potential Available Capacity, 8:00 p.m. to 8:00 a.m.” column, the total capacity potentially available for processing commercial waste during this period totals 11,931 tons, allocated among the eight MTSs. This does not take into account any environmental constraints that may limit the potential delivery of commercial waste.

**Table ES-3
Available Potential Excess Capacity at Converted MTSs
Based on the Capacity Reserved for DSNY-managed Waste**

Converted MTS Facility	Average Day Design Capacity ⁽¹⁾ (tpd)	Potential Available Capacity, Average Peak Day (tpd)	Average Peak Day			Maximum Number of DSNY Collection Vehicles, 8:00 a.m. to 8:00 p.m. (peak hour)	Potential Range of Maximum Number of Collection Vehicles ⁽³⁾ 8:00 p.m. to 8:00 a.m. (peak hour)
			Potential Available Capacity, 8:00 a.m. to 8:00 p.m. (tons)	Potential Available Capacity, 8:00 p.m. to 8:00 a.m. (tons)	Potential Additional Number of Commercial Vehicles, 8:00 p.m. to 8:00 a.m. ⁽²⁾ (per day)		
West 135 th Street	4,290	3,110	1,211	1,853	175	30	20-22
East 91 st Street	4,290	3,410	1,227	2,183	199	28	19-21
West 59 th Street ⁽⁴⁾	2,145	1,265	279	956	91	21	10-12
South Bronx	4,290	2,100	333	1,732	163	64	21-23
North Shore	4,290	1,920	622	1,000	95	39	24-26
Greenpoint	4,290	1,930	575	1,145	109	61	22-24
Hamilton Avenue	4,290	2,120	630	1,337	129	32	23-25
Southwest Brooklyn	4,290	3,200	1,418	1,725	162	27	21-23
Totals	32,175	19,055	6,295	11,931	1,123		

Notes:

- (1) Based on operating the MTSs under normal operating conditions. Spare operating line is not used to process waste.
- (2) Assuming commercial collection vehicles deliver an average of 11 tons per truck. (Field data indicates commercial collection vehicles average between 11 and 13 tons per truck.)
- (3) DSNY collection vehicles and commercial Waste Hauling Vehicles.
- (4) West 59th Street is a lift and load operation - not an open top-loading slot system.

3.3.2 Findings

3.3.2.1 Processing of Commercial Waste at the Converted MTSs

1. The CEQR analyses in the MTS Environmental Evaluation show there are no potentially significant unmitigatable adverse environmental impacts associated with on-site processing of DSNY-managed Waste. This would also apply to processing of

commercial waste at each converted MTS in the quantities shown in Table ES-3. However, further evaluation of potential on-site air quality, off-site noise and off-site air quality impacts from nighttime deliveries of commercial waste was required.

2. The on-site air quality analysis of processing DSNY-managed Waste at some of the Converted MTS sites showed that using the facility average design capacity (including the processing of commercial waste) to estimate pollutants did not cause an exceedance of annual average standards.
3. The off-site air quality analysis of processing DSNY-managed Waste at some of the Converted MTS sites showed that using the conservative assumption that peak hour conditions occur 24 hours per day (a Tier I analysis) resulted in unmitigatable environmental impacts for PM₁₀ and PM_{2.5}. (See Section 10 of the individual chapters in the MTS Environmental Evaluation for these analyses.) Therefore, a Tier II air quality analysis was also performed for deliveries of commercial waste at intersections near each of the Converted MTS sites. The analysis used data on actual hourly traffic volumes on routes to and from the site and included the higher number of commercial collection vehicles assumed to deliver to each Converted MTS during the 8:00 p.m. to 8:00 a.m. period. No significant adverse unmitigatable environmental off-site air quality impacts were identified.
4. Evaluating the potential for off-site noise impacts required the use of a second-level noise screening analysis. (See Section 3.14.5.2 of Volume III, Appendix A for a detailed explanation.) The results of this analysis indicate that the number of potential commercial Waste Hauling Vehicles that could be routed to the MTSs during various hours within the 8:00 p.m. to 8:00 a.m. period must be limited to less than the available excess capacity to avoid causing potential impacts at sensitive receptors on the analyzed routes these vehicles might take to the MTSs. The amount of available capacity that can potentially be used to process commercial waste during the hours of 8:00 a.m. to 8:00 p.m. without causing any significant adverse noise impacts is summarized in Table ES-4.

**Table ES-4
Converted MTS
Potential Commercial Waste Capacities Summary Table**

Location	Converted MTS Design Capacity		DSNY-managed Waste Delivered 8 p.m. to 8 a.m. (tons)	Potential Converted MTS Capacity with Off-Site Noise Constraints	
	Total Potential Commercial Vehicles (per day)	Potential Commercial Waste Tonnage 8 p.m. to 8 a.m. (tons)		Total Potential Commercial Vehicles (per day)	Potential Commercial Waste Tonnage 8 p.m. to 8 a.m. (tons)
West 135 th Street	175	1,853	301	95	1,029
East 91 st Street ⁽¹⁾	199	2,183	17	71	781
West 59 th Street ⁽²⁾	91	956	114	91	956
South Bronx ⁽¹⁾	163	1,732	433	150	1,611
North Shore ⁽³⁾	95	1,000	901	95	1,000
Greenpoint ⁽¹⁾	109	1,145	793	109	1,145
Hamilton Avenue ⁽¹⁾	129	1,337	710	124	1,306
Southwest Brooklyn ⁽⁴⁾	162	1,725	418	76	828
Total	1,123	11,931	3,687	811	8,656

Notes:

- (1) Need to use different routes for potential commercial Waste Hauling Vehicles to deliver the full amount of excess capacity for commercial waste.
- (2) Can take all potential commercial Waste Hauling Vehicles without any noise constraints.
- (3) There is a route to the North Shore Converted MTS that does not pass sensitive receptors that must be used from 12:00 a.m. to 6:00 a.m. to deliver the full amount available for commercial capacity. The route should not be used at other times upon request from NYCDOT due to congestion that occurs at certain intersections along the route during daytime traffic hours.
- (4) Outbound trucks passing 26th Street between Cropsey Avenue and Shore Road limit the number of inbound commercial Waste Hauling Vehicles that can be accommodated at the Southwest Brooklyn Converted MTS.

Since these results are based on a second-level screening for noise impacts, a detailed off-site noise analysis, utilizing FHWA TNM Version 2.1, is being performed to determine if noise impacts would actually occur at these sensitive receptor locations and/or if additional potential commercial Waste Hauling Vehicles could be routed to the MTS during the 8:00 p.m. to 8:00 a.m. hour, without causing unmitigatable significant adverse off-site noise impacts, to fully utilize the potentially available capacity of the MTSs. The results of the off-site detailed noise analyses will be available at a later date.

5. This evaluation of potential processing commercial waste at the Converted MTSs was limited to an environmental review that focused on traffic, on-site and off-site air quality and noise, and on-site odor impacts.

3.3.2.2 Processing of DSNY-Managed Waste at the Converted MTSs

This section summarizes key findings from Volume III, Appendix A, the MTS Environmental Evaluation, an environmental review of operations for the Converted MTSs in processing DSNY-managed Waste.

1. Table ES-5 summarizes the facility design capacity assumptions and the assumed tons of DSNY-managed Waste processed during average peak days that were the basis of the MTS Environmental Evaluation. The assumed tons of DSNY-managed Waste in this table vary from the tons shown in the DSNY-managed Waste Reserved Capacity Scenario Table ES-2. This reflects a contingency added to DSNY average peak day deliveries to provide a margin of conservatism in the analysis.
2. Based on the design capacity and operating assumption, described in more detail in Volume III, the MTS Environmental Evaluation found there were no unmitigatable significant adverse environmental impacts associated with processing the average peak day deliveries of DSNY-managed Waste. The environmental evaluation demonstrates the Converted MTSs will enable export of DSNY-managed Waste in an efficient and environmentally sound manner. This summary conclusion is supported by the environmental evaluation that addressed: Land Use, Zoning and Public Policy;

**Table ES-5
MTS Environmental Analysis Information**

Converted MTS Facility	Total Number of Loading Slots	DSNY-managed Waste Average Peak Day Deliveries, (tons)⁽¹⁾	Number of DSNY-Managed Vehicles, Average Peak Day	Average Day Design Capacity⁽²⁾ (tpd)	Peak-Hour Number of DSNY Collection Vehicles
West 135 th Street	4	1,416	222	4,290	30
East 91 st Street	4	1,093	130	4,290	28
West 59 th Street ⁽³⁾	3	1,068	124	2,145	21
South Bronx	4	2,804	363	4,290	64
North Shore	4	2,672	329	4,290	39
Greenpoint	4	3,387	423	4,290	61
Hamilton Avenue	4	2,248	267	4,290	32
Southwest Brooklyn	4	1,388	166	4,290	27
Totals		16,076	2,024	32,175	

Notes:

- ⁽¹⁾ All MTSs based on scale data from Fiscal Year 1998 received from the DSNY Bureau of Cleaning and Collection with a 20% contingency allowance, except for the South Bronx MTS. South Bronx MTS data is based on Fiscal Year 1997 with a 20% contingency allowance.
- ⁽²⁾ Based on operating the MTS under normal operating conditions. Spare operating line is not used to process waste.
- ⁽³⁾ West 59th Street is a lift and load operation - not an open top-loading slot system.

Socioeconomic Conditions; Neighborhood Character; Community Facilities and Services; Open Space and Parklands; Cultural Resources; Traffic and Transportation; Air Quality; Noise; Infrastructure and Energy and Solid Waste; Natural Resources (including Endangered Species and Habitats); Water Quality; Waterfront Revitalization Program; Hazardous Materials; and Urban Design and Visual Quality. For the eight MTSs, the following measures were identified to mitigate estimated adverse impacts for traffic and on-site noise.

- Traffic signal timing adjustments would mitigate estimated traffic impacts identified at five intersections near the South Bronx Converted MTS; three intersections near the Southwest Brooklyn Converted MTS; three intersections near the Greenpoint Converted MTS; two intersections near the Hamilton Avenue Converted MTS; one intersection near the West 135th Street Converted MTS; two intersections near the East 91st Street Converted MTS; and two intersections near the North Shore Converted MTS. No traffic impacts were estimated at traffic study intersections identified near the West 59th Street Converted MTS.
- Construction of a 20-foot-tall noise barrier located on the southern property line at the South Bronx Converted MTS would mitigate the potential noise impact on a nearby prison barge. A 20-foot-tall noise barrier located on the southeast property line of the Southwest Brooklyn Converted MTS and a restriction on the number of nighttime arrivals of collection vehicles queuing on trucks and ramps would mitigate the potential noise impact on a nearby residential complex.
- Subsurface site investigations at the Southwest Brooklyn, Greenpoint, and Hamilton Avenue Converted MTS sites are underway. Results will be provided at a later date.

These analyses and findings are detailed in the MTS Environmental Evaluation, the appendix to this volume.

3.4 Volume IV: Evaluation of Waste Disposal Capacity Potentially Available to New York City

This volume provides an assessment of disposal capacity available within seven states (Georgia, New York, New Jersey, Ohio, Pennsylvania, South Carolina and Virginia) for accepting City waste.

3.4.1 Scope of Analysis/Approach

The survey was primarily based on interviews with landfill and waste-to-energy (WTE) operators and municipal solid waste management employees. (The surveyed area includes states that can be reasonably accessed by truck transfer, ocean-going vessel transport, and rail.)

In addition to conducting the surveys, data on historic market prices in the surveyed area were reviewed. Historical market price information was gathered from *Solid Waste Digest* published reports.

An attempt was made to develop a reasonable econometric model based on the survey results. The econometric model approach was formulated and a determination was made that the data gathered was not sufficient to obtain meaningful results, primarily due to the lack of responses from the landfill operators on questions concerning long-term contract tip fees. Though the econometric model was not developed, the data was analyzed to estimate or determine:

- The excess capacity at high-capacity¹² landfills;
- Trends of historical spot market disposal price (i.e., tip fee) levels;
- Ownership of high-capacity landfills with rail access;
- Comparison of tip fees at rail-accessible and non-rail-accessible landfills; and
- Inflation-adjusted, real per ton tip fees.

3.4.2 Findings

The results of this assessment are summarized below:

- In the list of high-capacity¹³ disposal sites, there are a number of mega-landfills (landfills with a substantially larger capacity than 1,000 tpd) in states within the mid-Atlantic, Southeast and Midwest regions, exclusive of Pennsylvania and New York, that appear to have sufficient physical capacity to meet the additional demand of both DSNY-managed Waste and commercial waste generated by the City.

¹² High-capacity landfills are those that accepted at least 1,000 tpd of municipal solid waste (MSW) in 2003.

¹³ There were 87 high-capacity landfills identified in this report. Of these 87 landfills, 30 have rail access and one has barge access.

- Dispose of all the DSNY-managed Waste and commercial waste generated by the City over the New SWMP Planning Period. Most of the identified long-term disposal capacity is located more than 400 miles from the City and, therefore, is most likely economically accessible by rail, and to a lesser extent, by barge.
- Assuming the continuation of existing regulatory policies, landfill capacity in Pennsylvania will continue to decrease, and real tip fees should increase. (It is reasonable to assume, however, that some additional landfill capacity will be permitted to accommodate waste generated in Pennsylvania.) Data gathered during 2002 and 2003 indicate that there have been limited expansion/modification permits granted to mega-landfills in Pennsylvania, and while real (inflation-adjusted) spot market tip fee prices decreased over the six-year period of 1997 to 2003, these fees have increased in real dollars during the past two years (2002 to 2003). Part, but not all, of this increase is due to the Pennsylvania Department of Environmental Protection (PaDEP)-imposed \$4.00 per ton fee applied to all solid waste disposed of in Pennsylvania municipal solid waste (MSW) landfills, which went into effect in June of 2002.
- Assuming a relatively competitive marketplace, and given that there appears to be a sufficient amount of landfill capacity in the surveyed area, it is reasonable to expect that the long-term real (inflation-adjusted) contract tip fees in the surveyed area (exclusive of New York and Pennsylvania) will remain relatively stable in the near term.
- The above conclusion assumes a relatively competitive marketplace for disposal capacity. Two firms own approximately 70% of the high-capacity landfills with rail access, including 100% of the capacity in both Georgia and South Carolina, and more than 80% of the landfills meeting this criteria in Pennsylvania. The result of this effective duopoly could lead to market conditions and pricing structures that deviate from normal, competitive marketplaces.

3.5 Volume V: Manhattan Transfer Station Siting Report

This study investigates and evaluates potential sites for locating new transfer stations in Manhattan.

3.5.1 Scope of Analysis/Approach

The purpose of this report is to evaluate the potential to develop Manhattan-based truck-to-barge or truck-to-rail transfer stations. Facility conceptual designs and site plans were prepared to determine the feasibility of using each site as a transfer station, and research on land use regulations and applicable laws was also undertaken to identify other obstacles to development.

Five screening criteria were established, which, for further consideration, potential sites were required to meet. These criteria were:

- Technical and operationally feasible transfer station sites with the capability to process at least 1,000 tpd of waste.
- Conformance to the zoning and proximity to sensitive-use criteria outlined in DSNY's Siting Rules.
- Adherence to legislative restrictions on the use of the site for transfer stations.
- Suitability for export of waste by barge or rail.
- Collection vehicle access from nearby truck routes.

Four sites were evaluated: West 140th Street, Pier 42, West 30th Street and West 13th Street (Gansevoort Property). None of these four sites currently serve or are permitted as waste transfer facilities.

- The West 140th Street site was determined to be infeasible due to technical reasons. Specifically, there is insufficient property available to ramp trucks up to the required site level and at an acceptable grade due to the rail elevation. Other operational problems included lack of maneuvering room, traffic problems and limited on-site parking. In addition, the site is zoned M1 and is within 400 feet of Riverbank State Park.
- The Pier 42 site has significant technical disadvantages. Prohibitions against its use as a transfer station agreed to between the City and other parties present serious obstacles to its development as a transfer station. In addition, it is located in an M1-4 zone and is within 400 feet of a playground and park.
- The West 30th Street site was determined to be infeasible for technical reasons. It lies within two zones -- M1-6 and M2-3 -- and the portion located within the compliant M2-3 zone is too small to construct a 1,000 tpd transfer station. In addition, due to the site's limited size, rail operations would not be feasible, there would be insufficient space for storage of waste or for containers, there would be no room for on-site parking, and there would be limited queuing and maneuvering space.
- The West 13th Street site is overseen and operated by the Hudson River Park Trust and is situated within the Hudson River Park. It formerly served as the location of an MTS and is zoned M3-2. In order for it to serve as a site for a new waste transfer facility, the state legislation that created the Hudson River Park would have to be amended. Additionally, federal and state permits issued to allow for the development of the park, in particular those related to development over the water, would have to be modified. Important obstacles exist to making this site a transfer station.

As a result of the considerations noted above, all four Manhattan sites were determined to either be technically infeasible or have significant legislative, zoning, land use and/or technical obstacles for the development of a private putrescible transfer stations.

3.6 Volume VI: Waste Vehicle Technology Assessment

This report consists of a survey of alternative fuels, new engine technologies and vehicle emission retrofit options that are appropriate for use on waste collection vehicles. DSNY's extensive experience in alternative fuels, engine technology and retrofit options research and the results of numerous successful pilot programs implemented by DSNY are highlighted. The report assesses the advantages and disadvantages of the various options in terms of reducing consumption of fossil fuels and/or reducing vehicle emissions.

3.6.1 Scope of Analysis/Approach

The purpose of this evaluation is to explore the different types of alternative and clean fuel technologies available to determine which clean and alternative fuel technologies are most feasible for the unique demands of heavy-duty refuse haulers operating in the City. The review presented in the Waste Vehicle Technology Assessment report weighs the economic, environmental and logistical advantages and disadvantages of various clean and alternative fuel technologies. After thorough research and analysis of all available viable options, including several case studies, options that are best suited for heavy-duty refuse haulers operating in the City are presented.

3.6.2 Findings

The report found that clean diesel technology is best suited for the City's refuse hauling vehicles. It provides substantial emission reduction benefits without having a major impact on fuel efficiency and cost. Natural gas technologies are also well suited for the City's refuse hauling vehicles. However, the use of this technology entails significant infrastructure investment, and, because of high demand for natural gas, has greater cost uncertainties.

Clean Diesel Options

The clean diesel options discussed in the report can cut vehicle emissions by 90% or more.

Engine tune-ups are the least expensive way to reduce particulate matter (PM) emissions. This emission reduction strategy can also lower operating costs, extend engine life and improve fuel economy. However, it should be noted that repairs and maintenance of diesel engines tend to increase nitrogen oxide (NO_x) emissions.

In addition to tune-ups, in certain circumstances, the **replacement of older diesel engines and equipment** may be the most sensible and cost-effective emissions improvement options. When old vehicles are replaced, fleet managers can substitute their oldest and worst emissions performers with new technology present in new diesel engines that are designed to produce much lower emissions.

Sulfur found in fuel degrades the effectiveness and life of after-treatment devices by inhibiting the function of existing filters and catalysts. By using **ultra-low-sulfur diesel (ULSD)** (which has a sulfur content of 15 parts per million [ppm] or less) and/or low-sulfur diesel fuel (sulfur content between 30 ppm and 15 ppm), there can be improvements in the performance of after-treatment technologies seeking to reduce emission levels. However, ULSD fuel only reduces PM and SO₂ emissions. Without after-treatment devices, it does not reduce emissions such as hydrocarbons (HC), CO or NO_x emissions. Some operating and maintenance concerns associated with ULSD fuel include a slightly lower fuel economy as compared with regular diesel, and concerns regarding the lubrication properties of the fuel. DSNY, a leader in experimenting with heavy-duty refuse vehicles, currently has 600 of its 2,040 refuse collection trucks using low-sulfur diesel fuel.

Diesel oxidation catalysts (DOCs) devices are considered the most proven of after-treatment options and can be used with existing or used engines to pollute less by retrofitting them.¹⁴ According to the Diesel Technology Forum, emissions benefits include reductions of total PM by 20% to 50% and CO and HC by 60% to 90%.¹⁵ They do not reduce NO_x emissions.

Diesel particulate filters (DPFs), when used with ULSD fuel, can reduce PM emissions by 50% to 90%, and HC and CO emissions by as much as 90%. However, like oxidation catalysts, these devices do not reduce NO_x emissions.

Although the use of DOCs and DPFs is not yet widely available for waste collection trucks, tests are ongoing that are assessing the use of these after-treatment options. DSNY is taking the lead in testing these technologies.

Another emission reduction strategy is to use **exhaust gas recirculation** to decrease NO_x levels. With the new, lower-sulfur diesel fuels, production of sulfuric acid will be minimized. This technology can reduce NO_x emissions by as much as 40%, and can also be used with engines being retrofitted.

Selective catalytic reduction (SCR) has been used for over 15 years to reduce NO_x emissions from stationary sources. Emission reductions include NO_x by 75% to 90%, HC reductions up to 80% and PM reductions of 20% to 30%.

Currently, **NO_x catalysts** are being experimented with in the United States on retrofitted vehicles. Two NO_x catalyst technologies, “lean NO_x catalyst” and “NO_x absorber,” are currently being developed, and can reduce NO_x emissions up to 70%.

Natural Gas

The main incentive for choosing natural gas as an alternative fuel for heavy-duty refuse trucks is the emissions benefits. Studies of heavy-duty engines running on compressed natural gas (CNG)

¹⁴ Diesel Technology Forum, *Clean Air, Better Performance*, 2003.

¹⁵ *Ibid.*

and diesel have shown that engines fueled with CNG emit significantly less PM (80% to 90% less) and NO_x (50% to 60% less) emissions than diesel engines. Another benefit of using a CNG engine is the reduction of engine noise, as CNG engines are significantly quieter than diesel engines. Furthermore, investing in CNG facilities now will ease future transitions to hydrogen fuel cells as a vehicle-fueling source.¹⁶

One of the major disincentives to creating a CNG refuse truck fleet is the cost related to purchasing the trucks and the infrastructure needed for a CNG facility. A CNG trash hauler can cost up to \$70,000 more than a conventional diesel truck. In addition, the cost of a CNG facility with fueling, proper ventilation and leakage alarms can cost \$500,000 to \$1,250,000 to construct.¹⁷ Another disadvantage of CNG is that most of the natural gas used in CNG engines comes from reserves in North America. Due to unmet demand for natural gas in the U.S., natural gas has seen extreme price fluctuations. In addition to the high costs, other issues, such as lower fuel efficiency than conventional diesel garbage trucks (due to heavier weight and longer size of vehicles), limited vehicle range, and high methane (CH₄) and CO₂ emissions, must be considered.

Other Available Technologies

The report also evaluates the costs and benefits of other alternatives, including biodiesel, fuel cells, battery electric, propane, ethanol, methanol, and hybrid electric vehicles (HEVs), but none were deemed as promising and cost effective to DSNY as the clean diesel and natural gas options.

Based on this report, DSNY should consider the following options:

- Continuing to utilize and experiment with ULSD fuel and clean diesel technology in existing vehicles with the goal of all diesel vehicles, currently in operation, utilizing clean diesel technology to meet USEPA 2004 and 2007 emissions standards.

¹⁶ INFORM, Inc., *Greening Garbage Trucks: New Technologies for Cleaner Air*.

¹⁷ *Ibid.*

- Continuing to make clean diesel technology the preferred vehicle standard for new heavy-duty refuse vehicle purchases.
- Continuing to test and compare alternative fuel exhaust emissions in order to evaluate hybrid electric refuse vehicles.
- Continuing to pursue its CNG heavy-duty program, so that DSNY will be able to take advantage of potential advancements in CNG technology and fuel cell technology.
- Continuing to develop partnerships with fuel suppliers, original equipment manufacturers (OEMs) and infrastructure providers in order to help reduce the cost of clean fuel implementation.
- For light-duty vehicles, continuing with ethanol purchase and plans for ethanol fueling facilities.
- Utilizing government grants and economic incentives to offset the higher costs associated with natural gas, hybrid electric and ethanol vehicles.

Private waste haulers in the City should consider these options:

- Retrofitting old diesel vehicles with clean diesel technology.
- Beginning to use ULSD ahead of June 2006 mandate.
- Deploying and purchasing clean diesel vehicles now to avoid future expenses that will be needed to meet new strict USEPA emission standards.
- Utilizing government grants and economic incentives to help offset the incremental capital costs associated with natural gas refuse vehicles.
- In conjunction with infrastructure supplier and engine manufacturers, exploring the future option of CNG heavy-duty refuse vehicles.

ATTACHMENT A
LOCAL LAW 74 OF 2000

Int. No. 842/Local Law 74 of 2000

By The Speaker (Council Member Vallone), Council Members Michels, Robles, Fisher, Rodriguez, DiBrienza, Boyland, Carrion, Fiala, Marshall, Provenzano, Quinn, Oddo, Clarke, Dear, Malave-Dilan, Eisland, Espada, Foster, Linares, Moskowitz, Nelson, O'Donovan, Pinkett, Abel, Golden, Stabile and Ognibene (in conjunction with the Mayor)

A Local Law to amend the administrative code of the city of New York, in relation to requiring a comprehensive study of the commercial solid waste management system within New York city.

Be it enacted by the Council as follows:

Section 1. Declaration of Legislative Intent and Findings. The legislatively mandated closure of the Fresh Kills Landfill by January 1, 2002 opens a new era in solid waste management in New York City and affords an opportunity to reexamine all aspects of how solid waste is managed, including that generated by the commercial sector. Moreover, New York City must now begin development of its next Comprehensive Solid Waste Management Plan.

Until the late 1980s, private carters paid a tipping fee to dispose of solid waste in the City's Fresh Kills landfill. In 1988, the tipping fee was raised to discourage private carters from using the Fresh Kills landfill in order to extend the landfill's useful life. This resulted in increased amounts of solid waste being sent to private transfer stations in New York City and the region.

Solid waste transfer stations and the trucks transporting waste to and from those facilities may generate such problems as dust, debris, noise, odors, air pollutants, vermin and traffic congestion. The Council is concerned that transfer stations and private carters in New York City may need more regulation

in order to protect the communities in which they are located and conduct business and to ensure effective enforcement of the rules governing their operation.

The Council finds that a comprehensive study of the commercial solid waste management system within the City of New York is critical in order to enable the City to assess and plan for management of both the residential and commercial waste streams in the most efficient manner, to minimize the potential adverse impacts on the City's residential and business communities and the environment, and to assist in developing a new comprehensive solid waste management plan.

§2. The administrative code of the city of New York is amended by adding a new section 16-134 to read as follows:

§16-134 Comprehensive study of commercial solid waste management system required. a. 1. "Long haul transport vehicle" shall mean any motor vehicle used to remove solid waste or other material from a putrescible or non-putrescible solid waste transfer station for final disposal, reuse or recycling.

2. "Private carter" shall mean any individual or business entity required to obtain a license from the trade waste commission pursuant to subdivision a of section 16-505 of this title.

3. "Trade waste commission" shall mean the New York city trade waste commission as established by section 16-502 of this title.

b. The department, in consultation with the trade waste commission, shall enter into one or more contracts for the performance of a comprehensive study of the existing commercial solid waste management system within the city of New York. In performing the study, the department and/or the contractor or contractors shall solicit and consider the views of elected officials, the citywide recycling advisory board, the borough solid waste advisory boards and the public, including residents of affected communities, environmental advocacy organizations, transfer station operators, private carters, business entities and academicians, and respond to substantive issues raised. The study shall include, but need not be limited to, an analysis of the following:

1. the effectiveness of procedures employed and the criteria applied by the department for the issuance and renewal of permits for the operation of putrescible and non-putrescible solid waste transfer stations in minimizing potential adverse environmental, economic and public health impacts on the communities in which such transfer stations are located by examining such issues as (i) the effectiveness of the criteria applied by the department to the siting of putrescible and non-putrescible solid waste transfer stations, including the aggregate effect of the geographic proximity of solid waste transfer stations to each other and (ii) the scope and effectiveness of the operational restrictions imposed upon putrescible and non-putrescible solid waste transfer stations, including the hours of operation and any performance standards established in the zoning resolution of the city of New York;

2. the manner in which all applicable laws, rules and regulations relating to the operation of putrescible and non-putrescible solid waste transfer stations, private carters and long haul transport vehicles are enforced, including who should be responsible for such enforcement, and the effectiveness of such enforcement in obtaining compliance with such laws, rules and regulations and in minimizing potential environmental, economic and public health impacts and an analysis of rules relating to routes for transporting material to or from such transfer stations;

3. the means and potential effects of limiting the number and capacity of putrescible and non-putrescible solid waste transfer stations in the city;

4. the size and type of vehicles that should be authorized to transport solid waste to or from putrescible and non-putrescible solid waste transfer stations and fuel-type requirements for such vehicles;

5. whether putrescible and non-putrescible solid waste transfer stations and city-owned marine transfer stations should receive and process both residential and commercial solid waste and the options for transporting such solid waste to and from such transfer stations, including an analysis of potential environmental, economic and public health impacts; and

6. potential environmental, economic and public health impacts on communities in which large numbers of privately-owned putrescible and non-putrescible solid waste transfer stations are located such as, but not limited to,

potential impacts related to air quality, water quality, odors, traffic congestion and noise.

c. The study required by subdivision b of this section, and a report containing a detailed analysis of the findings of such study, as well as recommendations based on such analysis and findings, shall be completed no later than eighteen months after registration of the consultant contract and at least two months before the next draft comprehensive solid waste management plan is submitted to the council or the New York state department of environmental conservation. Such report shall be submitted to the mayor and the council immediately upon its completion. A preliminary report containing data necessary to perform the analyses described in subdivision b of this section shall be submitted by the department to the mayor and the council during or before the last quarter of calendar year two thousand one.

d. Such study shall be performed and such report shall be prepared in a manner designed to assist in the preparation of the next comprehensive solid waste management plan for the city of New York required by section 27-0107 of the New York state environmental conservation law.

§3. This local law shall take effect immediately.

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ATTACHMENT B
FINAL STUDY SCOPE

**COMMERCIAL WASTE MANAGEMENT STUDY
FINAL SCOPE OF WORK**

New York City Department of Sanitation

JULY 31, 2003

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**CITY OF NEW YORK
DEPARTMENT OF SANITATION
COMMERCIAL WASTE MANAGEMENT STUDY
FINAL SCOPE OF WORK**

1.0 INTRODUCTION

The New York City (City) Department of Sanitation (DSNY) collects and/or disposes of waste generated by residences, institutions, not-for-profit organizations, DSNY lot cleaning operations, and other City, state and federal agencies (hereinafter referred to as DSNY-managed Waste¹). Private waste carting companies collect and dispose of waste from commercial sources in the City. Both DSNY and private companies recycle materials, including paper, cardboard, metal, glass and plastic.

DSNY has the responsibility to manage all of the waste generated in the City and to develop a new Comprehensive Solid Waste Management Plan (New Plan) for both DSNY-managed Waste and commercial waste for the planning period 2004 through 2024. Because the City has no operating landfill, incinerator or resource recovery facilities, pursuant to interim export contracts, all DSNY-Managed Waste is either transferred from private transfer stations within the City or carted out of the City in DSNY collection vehicles for transfer and/or disposal at facilities outside of the City. Except for DSNY-managed Waste transferred out of the Bronx, DSNY's interim export arrangements depend on truck transport. Under its long-term export program, the City is converting its existing Marine Transfer Stations (MTSs), designed to transfer waste in open hopper barges to the now-closed Fresh Kills landfill, into facilities that containerize waste for transport by container barge. It is anticipated that the waste will reach a disposal facility through a combination of barge and/or rail movements. Since 1989, when DSNY raised the fees for private waste disposal at Fresh Kills, the City's commercial waste has been carted or transferred from the City by truck, much of it through private transfer stations located in the City.

¹ DSNY-managed Waste is solid waste that DSNY collects from all residential households in the City and the institutional waste of City, state and federal agencies that DSNY collects and/or for which DSNY arranges disposal.

The Commercial Waste Management Study (Study), described herein, addresses issues related to the management of commercial waste in the City. Private waste transfer stations process three categories of waste: (i) *putrescible waste* (garbage that can cause odors); (ii) *non-putrescible waste* (typically including construction and demolition debris and/or other recyclable materials that do not cause odors); (iii) and *clean fill* (a subset of non-putrescible, but handling only excavated dirt, rock, concrete, gravel, stone, asphalt millings or sand). At *putrescible waste* transfer stations, waste is transferred to long haul trucks or rail cars for export. *Non-putrescible waste* transfer stations and *clean fill* transfer stations typically engage in sorting, crushing and processing of material; therefore, much of the material that they receive is recycled or reused.

Under the City's Zoning Resolution, transfer stations can be sited in the City's industrial zones (manufacturing districts M1, M2, and M3). Zoning performance standards for such districts establish standards for the emission of odors and dust, vibration, heat, glare, and explosive hazard. M1 districts have the highest performance standards, M2 districts have medium performance standards and M3 districts have the least restrictive performance standards. DSNY and the New York State Department of Environmental Conservation (NYSDEC) issue permits regulating the design and operation of private transfer stations in the City. Applicants for permits must also submit an Environmental Assessment Statement, which assesses all impacts the facility and operation would have on the surrounding environment. NYSDEC and DSNY act as co-lead agencies in the environmental review process for such permits. DSNY rules for permitting putrescible waste transfer stations were adopted in 1991. In 1998, the City adopted Siting Rules that increased the restrictions on where transfer stations could be located. There are now 69 operating transfer stations, including 22 stations handling putrescible waste, 25 stations handling non-putrescible waste and 22 stations handling only clean fill.

To help determine whether transfer stations and private carters in the City may need more regulation to ensure effective enforcement of the rules governing their operation, the City Council enacted Local Law 74 (LL 74), effective December 19, 2000, requiring a comprehensive assessment of commercial solid waste management in the City. The Study is intended to enable the City to assess and plan for management of the commercial waste stream in the most efficient manner, to minimize potential adverse impacts on the City's residential and business communities and the environment, and to assist in developing the New Plan.

In June 2002, DSNY published a Preliminary Report, required to be issued in compliance with LL 74, that contained data on the volumes, types, origins and destinations of the commercial waste managed by private companies in the New York Metropolitan area, and included information on residential and institutional waste collected by DSNY and managed through commercial waste transfer stations following the phased closure of Fresh Kills. The Study proposed to be undertaken now, among other things, will analyze and assess the adequacy and impacts of the siting, permitting, operations and regulation of commercial waste transfer stations.

In March 2003, DSNY proposed rules that would temporarily restrict (until July 31, 2004) the permitting of new waste transfer stations, except intermodal facilities. The proposed rules would allow putrescible facility expansions upon the completion of the City Environmental Quality Review process; putrescible expansions would be prohibited in Brooklyn Community Board 1 and Bronx Community Board 2, unless equivalent capacity were closed within the same community board. DSNY held a hearing to receive public comments in April 2003 and expects to publish the final text of the temporary restrictions shortly. DSNY anticipates that it will draft and publish proposed permanent siting rules after the issuance of the Study Report and a review of its recommendations. The proposed rules and the transcript of the April hearing appear on the DSNY website.

In developing the Draft Scope of Work for the Study (Draft Study Scope), DSNY conducted a series of meetings in November and December of 2002 to solicit comments from elected officials, the public, the Citywide Recycling Advisory Board (CRAB), the Borough Solid Waste Advisory Boards (SWABs), Community Boards, environmental organizations, academics and other interested organizations. A public meeting was held in each borough on the following dates:

- Brooklyn – November 18, 2002
- Queens – November 19, 2002
- Staten Island – November 20, 2002
- Manhattan – November 25, 2002
- Bronx – December 2, 2002

DSNY invited the public to speak at these meetings, and to submit written comments through December 16, 2002. The transcripts of the public meeting testimonies were posted on DSNY's website in tandem with the Draft Study Scope.

DSNY and its consultants prepared the Draft Study Scope to reflect public comments and the specific requirements of LL 74, as discussed above. On March 3, 2003, the Draft Study Scope was posted on the DSNY website (www.nyc.gov/sanitation) for further public comment for a period of 21 days, until March 24, 2003. Concurrently, the Draft Study Scope was mailed to all elected officials and Community Boards, the CRAB, the SWABs and to individuals who attended the public meetings held in 2002 and/or submitted comments in connection with the development of the Draft Study Scope. A sample letter enclosing the Study Scope and describing the public comment process established to finalize the Study Scope was posted on DSNY's website in tandem with the Draft Study Scope.

Public Comments on the Draft Study Scope

Public comments received both during and after the established public comment period consisted of nineteen letters (three from elected officials, two from solid waste industry representatives, one from a national environmental organization, four from City solid waste advisory boards, six from neighborhood organizations or coalitions and three from special interest representatives). The letters were reviewed and considered by DSNY and the consultant team in preparation for the issuance of this Final Study Scope.

The majority of comments highlighted issues already addressed in the Draft Study Scope. Among these were requests that the consultant team:

- Investigate potential transfer station sites in Manhattan;
- Consider waste management strategies such as flow control and commercial waste franchising;
- Acknowledge the economic value of a robust commercial waste management system;
- Develop data on recyclables destinations;
- Consider the use of bio-diesel as an alternative fuel;

- Consider the decline in waste after the events of September 11th and Preliminary Report data in developing capacity projections for the planning period;
- Consider the economics of the fee structure for accepting commercial waste at the new MTSs;
- Evaluate incentives to barge and rail transfer;
- Consider the value to the City of reserve capacity when evaluating facility impacts;
- Analyze PM10 and PM2.5 air impacts;
- Use, to the extent available, Business Integrity Commission information to develop waste routing, generation and origination data; and
- Solicit and consider community concerns.

As a result of these comments, DSNY and the consultant team are taking specific note of the concerns raised and will amplify the discussion in the Study Report to address these concerns.

The remaining comments contained suggestions that did not result in Study Scope changes; many focused on issues that fall outside the Study Scope, but will be addressed in the development of the New Plan. These comments included suggestions on:

- Proposed alternatives to MTS containerization sites;
- MTS containerization design;
- MTS containerization environmental review;
- Alternative waste processing and disposal technologies;
- Grandfathering existing transfer facilities;
- Performance standards in specific zoning use groups;
- Communities to be considered as additional Study Areas;
- Transfer station site investigations outside of Manhattan;
- A Study advisory panel;
- Targeted outreach to be required in the development of the New Plan;
- Programmatic waste prevention, recycling and composting issues appropriately addressed in the New Plan; and
- Commercial/institutional food waste disposers more appropriate for study by the New York City Department of Environmental Protection.

Scope Changes

In addition to text changes in this Introduction that describe the content and consideration of public comments received, the issuance of the Final Study Scope, updating the definition of clean fill to include asphalt millings, and proposed transfer station temporary siting restrictions, revisions to the Final Study Scope correct formatting and typographical errors and reflect:

- Changes in the availability and form of the base data to be relied on to develop estimates on waste generation, including employment-based estimates of commercial waste generation (see Section 2.0 paragraph 1; Section 3.0 Summary of Task 4.1; Subtasks 4.1.2, 4.1.4 and 4.1.6);
- The addition of neighborhood character as an element of impact assessments (see Section 3.0 Summary of Task 4.2 and Task 4.4; Subtasks 4.2.2, 4.4.1 and 4.4.3);
- Changes in the predictive quality of information to be relied on to develop economic trend analysis on waste transportation and disposal markets and costs (see Section 3.0 Summary of Task 4.3; Task 4.3);
- New survey data to be generated by the City's Business Integrity Commission (see Section 3.0. Summary of Task 4.1; Subtask 4.1.3); and
- DSNY's extensive experience with alternative fuels and engine controls (see Section 3.0 Summary of Task 4.7; Task 4.7).

The Final Study Scope can also be obtained in printed form through a request directed to the DSNY Contact Person:

Harry Szarpanski, Assistant Commissioner
New York City Department of Sanitation
Bureau of Long Term Export
44 Beaver Street, 12th Floor
New York, New York 10004
Fax: (212) 269-0788

It is anticipated that the Study and accompanying report (Study Report) containing findings and recommendations will be issued in March 2004. There will be public involvement in reviewing the draft findings and recommendations that result from the Study. Thereafter, findings and recommendations that DSNY proposes to incorporate in the New Plan will be subject to public comment during the public review process for the New Plan. The environmental impact of the implementation of such recommendations proposed for inclusion in the New Plan will be evaluated in the Draft EIS prepared to support the adoption of the New Plan.

1.1 Summary of Objectives

In assessing the current regulations of commercial transfer stations as mandated by LL 74, the Study will evaluate the need for and may recommend changes in the regulatory system, including the strategies, incentives, new regulations and new legislation necessary to implement these recommendations. These recommendations may address:

- The siting and operation of private transfer stations and waste collection operations;
- The future demand for commercial transfer capacity and evaluating long-term economic trends affecting waste disposal; and
- The means of facilitating a transition from the current mode of truck-based export to export by barge and/or rail.

1.1.1 Requirements of Local Law 74 of 2000, New York Administrative Code §16-134

LL 74 mandates that the Study address the following:

1. Permitting Criteria, Environmental Review and Mitigation

The effectiveness of DSNY permitting procedures and criteria in minimizing potential adverse environmental, economic and public health impacts on the communities in which privately-owned transfer stations (Transfer Stations) are located by examining such issues as the:

- Effectiveness of the criteria applied by DSNY to the siting of Transfer Stations [16 RCNY 4-32], including the aggregate effect of the geographic proximity of solid waste transfer stations to each other; and
- Scope and effectiveness of the operational restrictions imposed upon Transfer Stations, including the hours of operation and any performance standards established in the New York City Zoning Resolution.

2. Regulatory Enforcement; Truck Traffic

The manner in which all applicable laws, rules and regulations relating to the operation of Transfer Stations, private carters and long haul transport vehicles are enforced, including:

- Who should be responsible for such enforcement;
- The effectiveness of such enforcement in obtaining compliance with such laws, rules and regulations and in minimizing potential environmental, economic and public health impacts; and
- Analysis of rules relating to routes for transporting material to or from such transfer stations.

3. Limits on Transfer Stations

The means and potential effects of limiting transfer station capacity in the City.

4. Waste Transportation Vehicles

The size and type of vehicles that should be authorized to transport solid waste and the fuel-type requirements for such vehicles.

5. Processing of DSNY-managed Waste and Commercial Waste in the same Facility

Whether private Transfer Stations and the City's MTSs should receive and process both residential and commercial solid waste, and the options for transporting such solid waste to and from such Transfer Stations, including an analysis of potential environmental, economic and public health impacts.

6. Impacts of Relative Concentrations of Transfer Stations

Potential environmental and public health impacts on communities in which concentrations of Transfer Stations are located such as potential impacts related to air quality, water quality, odors, traffic congestion and noise.

1.1.2 Other Study Objectives

Other objectives of the Study are to:

- Provide for the projected need for transfer station capacity over the planning period for the New Plan;
- Further refine information in the Preliminary Report on the quantity of commercial waste generated in the City; and
- Evaluate trends in the supply and cost of waste disposal capacity that will be available to the City.

1.2 Scope Organization

Section 2.0 of this Scope summarizes the issues that will be addressed in the Study. Section 3.0 describes the detailed analyses and methodologies that will be applied by DSNY's Consultant Team to evaluate these issues.

2.0 SUMMARY OF ISSUES TO BE ADDRESSED

The following summarizes the issues to be evaluated in the Study:

1. In June 2002, DSNY published a Preliminary Report in accordance with the requirements of LL 74 that contained information on commercial waste quantities by type and borough of origin that had been collected and analyzed by DSNY and its consultants from sources such as available reporting systems and interviews with waste management companies involved in aspects of the commercial waste management business. As noted in the Preliminary Report, there is no single comprehensive system for recording data on commercial waste generation in the City. Furthermore, the data in the Preliminary Report were for the calendar year 2000, and the events of September 11, 2001 and the subsequent decline in business activity in the City since 2000 have all affected commercial waste generation. The Study will apply methods to adjust the year 2000 data to year 2002 to account for these economic effects. Additionally, the Study will evaluate and apply alternative methods to those used in the Preliminary Report to supplement existing estimates of commercial waste generation. The recycled material in the commercial waste stream that is not accounted for in the Preliminary Report data will also be quantified. The Study will project changes in commercial waste generation over the New Plan period based on an employment forecast for the same period.
2. The Study will assess: (i) the means and potential effects of limiting the number of privately owned/managed putrescible and non-putrescible commercial waste transfer capacity in the City over the 20-year New Plan horizon; and (ii) the potential effects of converting the City's Marine Transfer Stations (MTSs) to containerization facilities for the export of commercial waste. The assessment of MTS conversion to commercial waste export will consider technical feasibility, the potential for environmental impacts, and economic viability. Beyond the use of converted MTSs, the Study will assess the potential for additional barge or rail-based waste transfer capacity for the commercial waste generated in midtown and downtown Manhattan.
3. The Study will evaluate the volume of out-of-City waste disposal capacity that is economically accessible by export in transfer trailers from the City. If the Study projects a decline, the Study will also identify the means to encourage a shift in commercial waste transport operations to barge or rail modes to ensure access to more remote disposal sites.
4. The Study will identify Community Districts in which commercial waste transfer stations are currently most concentrated, evaluate whether the types of potential impacts referenced in LL 74 may be attributable to the operation of these facilities, and, if so, evaluate remedial measures.
5. The Study will evaluate the effectiveness of existing regulations and the potential need for improved enforcement practices and/or new regulations that could prevent or minimize impacts on the City's residents and businesses that are attributable to

transfer operations. As appropriate, the Study will recommend means of improving enforcement of existing regulations or the adoption of new regulations to address identified problems.

6. The Study will identify and evaluate the effectiveness of potential new policy initiatives that could improve the overall long-term utility of the commercial waste transfer system to the City and mitigate or minimize impacts associated with commercial waste transfer operations.
7. The Study will assess means of reducing the potential for impacts, such as air emissions and noise, associated with the operation of private collection and long haul vehicles.

The Study will produce a summary of findings and recommendations from the evaluations of the issues defined above. These findings and recommendations, with associated technical analyses, will provide a framework for consideration of the policies proposed for the management of commercial waste in the New Draft Plan.

3.0 TASK OVERVIEW

This Section 3.0 summarizes the objective and content of the detailed Task descriptions and methodologies presented in Section 4.0.

Summary of Task 4.1 Quantification of Commercial Waste

The waste quantification effort includes six Subtasks that focus on refining the commercial waste data contained in the Preliminary Report. The approach involves making certain updates to the Preliminary Report data and applying alternative methods of estimating waste generation. The information obtained will be compared to the Preliminary Report estimates, and will supplement or refine the information contained therein. These Subtasks include the following:

- The Preliminary Report data was from the calendar year 2000. In the intervening period, the events of September 11, 2001 and the economic decline of the City's economy are assumed to have affected commercial waste generation. Additionally, some of the data in the Preliminary Report reflect the fact that, at that time, the City was still disposing of some waste at Fresh Kills. Subtask 4.1.1 describes the method that will be used to update and/or adjust the Preliminary Report data to provide a foundation for forecasting future year commercial waste generation.
- Subtask 4.1.2 will apply an alternative waste estimation methodology. Employment-based waste generation factors derived from multiple sources, year 2000 Census data on employment categorized in two-digit SIC codes, and adjusted employment forecast data through 2025 will be used to develop a long-term forecast of commercial waste generation. Additionally, similar factors applicable to commercially-generated recyclables will be used to characterize and quantify the recycled fraction of commercial waste. Estimates of recycled quantities will be supplemented and refined through contact with large generators, recyclers, and end users (i.e., paper mills and dealers) in the region.
- To develop Subtask 4.1.3 data, DSNY and the consultant team will rely on a survey being performed by the Business Integrity Commission (BIC), which regulates the commercial waste carting industry in the City, for information on carter collection routes and types of businesses served. Additionally, information will be sought on the garaging and dispatching of collection vehicles by carters serving the Manhattan business districts and the City as a whole.
- The Preliminary Report relied on the DSNY Transfer Station Reports and interviews with carters operating in the City to estimate total waste generated. Subtask 4.1.4 will focus on supplementing this information by contacting out-of-City operators of

waste-to-energy facilities and commercial waste transfer stations in the New York Metropolitan area to obtain information on quantities of commercial waste generated in the City and delivered to these facilities.

- As reported in the Preliminary Report, Construction and Demolition Waste (C&D) is the largest component of waste and recycled material. The variability in generation of C&D waste over time is influenced by different factors than that of the putrescible category of commercial waste. Subtask 4.1.5 will focus on developing factors that can predict how the C&D stream will vary as a function of construction activity in the City and, on this basis, estimate the City's need for transfer/recycling capacity for this material.
- Information developed in Subtasks 4.1.1 through 4.1.4 will be used to project quantities of commercial waste generated, disposed and recycled over the Plan period of 2004 through 2023.

Summary of Task 4.2 Needs Assessment for Commercial Transfer Station Capacity

The potential need for new commercial waste transfer station capacity will be investigated in two areas:

- Subtask 4.2.1 will investigate potential sites for truck-to-barge or truck-to-rail transfer stations in lower and midtown Manhattan. This analysis will define facility design criteria, identify any sites that conform to these criteria, conduct a fatal flaw analysis of factors that would preclude siting at these locations, and, if no such flaws are identified, summarize the advantages and disadvantages of the sites that appear feasible.
- The Mayor, in his announcement of the MTS conversion program for DSNY-managed Waste, indicated that the using of these converted facilities to containerize and transfer commercial putrescible waste by barge would be considered, as well. Subtask 4.2.2 will: (i) assess the MTS conversion designs to determine if significant quantities of commercial putrescible waste, in addition to DSNY-managed Waste, can be transferred from the converted MTSS; and, (ii) if there is a potential for commercial transfer capacity at an MTS site, the potential incremental impacts of receiving and transferring commercial putrescible waste will be evaluated to determine if any unmitigatable adverse impacts might result. These environmental analyses will assess potential traffic, air quality, water quality, noise, odor and public health and neighborhood character impacts that might result from the transfer of an increment of commercial putrescible waste through the converted MTSSs.

Summary of Task 4.3 Evaluation of Waste Disposal Capacity Potentially Available to the City

To better understand the City's requirements for a commercial waste transfer infrastructure over the 20-year period of the New Plan, an economic study will be performed in Task 4.3 that will seek to develop information on the economic market for transport and disposal of waste exported from the City. The assessment will survey existing and proposed landfill and waste to energy facility capacity, identify available historical data on disposal costs and capacity, and develop estimates of the economics of waste transport and disposal by truck, rail and barge. This information will be organized to define the service area in which the City is one of many buyers of remote disposal, and to develop approaches for estimating long-term waste transport and disposal costs in this marketplace.

Summary of Task 4.4 Assessment of the Potential Impacts of Relative Concentrations of Commercial Waste Transfer Capacity

As mandated in LL 74, Study Task 4.4 will assess the environmental, economic and public health impacts from the relative concentration of commercial transfer stations in four selected Study Areas. The assessment will address both on-site and off-site related impacts. The purpose of this assessment is to evaluate whether and how the total volume of waste processing activity in areas with relative concentrations of transfer stations may cause potentially adverse air quality, odor, traffic, noise, water quality public health and neighborhood character impacts. This Task, in combination with the enforcement effectiveness evaluation (Task 4.6), will also evaluate whether new or revised regulations and ordinances applicable to the siting, design and operation of transfer stations would significantly diminish the potential for adverse impacts.

Summary of Task 4.5 Assessment of the Design and Operation of Existing Commercial Transfer Stations

A field survey will be conducted in Study Task 4.5 to assess the design and operation of a select sample of existing putrescible, C&D and fill material commercial waste transfer stations. The purpose of the field survey is to assess and identify potential changes to facility designs (i.e., perimeter fencing, on-site queuing space, exhaust controls, etc.) and/or operational practices

(waste storage and handling, locations of equipment, hours of operation, etc.) that would mitigate the potential for impacts to nearby communities. The recommended design and/or operational changes may be incorporated into the policy strategies that are the outcome of this Study, as changes to regulatory requirements for permitting existing, modified or new transfer stations in the City.

Summary of Task 4.6 Evaluation of Permitting and Enforcement Effectiveness in Regulating Commercial Waste Collection and Transfer Operations

The focus of this Task is the detailed analysis of existing City and New York State controls on transfer station development and the evaluation of the effectiveness of current enforcement policies. The Consultant Team will research current policies governing the issuance of permits and existing practices regarding the evaluation of their impacts. The Consultants will prepare an inventory of the responsible agencies and their respective permitting and enforcement authorities that apply to the construction and operation of transfer stations in the City. This work is intended to plot the scope of the regulations governing transfer stations. The principal regulatory mechanisms are: (i) DSNY Siting Rule requirements and NYSDEC Part 360 permitting requirements for new and expanded or modified transfer stations; (ii) Zoning Performance Standard requirements; (iii) DSNY Permitting Regulations; and (iv) City DOT Traffic Regulations. Studies in the effectiveness of the enforcement of applicable regulations will be performed to identify gaps in enforcement coverage. If deficiencies are identified through a review of community complaints and notices of violation issued, the extent of impacts due to deficiencies in existing regulations and enforcement practices will be tested, and an Enforcement Effectiveness Report will be prepared.

Summary of Task 4.7 Evaluation of Alternative Collection Vehicles

Under almost any scenario for the future, the movement of solid waste in the City will remain heavily dependent upon diesel-powered trucks. The ideal and most effective measures to reduce air pollution would be to reduce the emissions by these trucks. The main objective of this Task is to determine if alternate fuels, fuel-efficient engine technologies or truck types might be feasible means of reducing truck emissions.

Summary of Task 4.8 Findings and Recommendations

Findings from each of the Tasks completed in the Study will be summarized in the Study Report. The Report will also identify recommendations for policy strategies that may be implemented by the DSNY or proposed for adoption in the New Plan. Results of the Study and recommended policy strategies will be included in the Study Report.

4.0 DETAILED SCOPE OF WORK

This section describes the Study Tasks corresponding to the items enumerated, including the proposed methodologies that will be used in performing the Study.

Task 4.1 Quantification of Commercial Waste

The following six Subtasks describe various methods that will be used to adjust, refine and cross-reference the estimates of commercial waste generation presented in the Preliminary Report and also to develop estimates of the major recycled components of commercial waste that are not accounted for in the Preliminary Report data.

4.1.1 Adjustment of Preliminary Report Data

The database used to prepare the Preliminary Report will be updated to reflect 2002 waste disposal volumes in order to account for the potentially significant effects on waste generation attributable to the September 11 event and the decline in the City's economy since the data were originally collected. The update will only use information available from the DSNY Transfer Station Quarterly Reports for calendar year 2002 and compare this more current information to the data from the same source for 2000. These current reports will be entered into the database according to the type of waste collected and disposal destination. The change in reported quantities between 2000 and 2002 will be evaluated to derive adjustment factors for change in commercial waste in each borough. These adjustment factors will be applied to the origin patterns of waste that were obtained in the 2000 survey of private carters to re-estimate the pattern of 2002 waste origins. The changes over the elapsed two-year period in volume, type and destination of waste will be compared.

4.1.2 Employment-Based Waste Estimation Model

A methodology originally developed for the U. S. Environmental Protection Agency (USEPA) by a member of the Consultant Team will be used to estimate the quantity and composition of the commercial putrescible waste stream. This methodology has been modified for application at

the local level. Generation estimates, presented at the Borough and Community District levels, will be developed with available employment data. The employment data is derived from year 2000 Census Tract level projections prepared by the New York Metropolitan Transportation Council (NYMTC), which was subsequently adjusted for the effects of the September 11, 2001 disaster and the decline in business activity in the City. These adjusted data will be used in projecting commercial waste volumes over the planning period for the New Plan. Waste generation estimates will be categorized by type of business, depending on the level of detail in the available employment data.

Waste composition factors derived from specific commercial subsector studies – office sector, health providers, manufacturers (other than waste byproducts from manufacturing processes), food establishments (restaurants and supermarkets), retail and wholesale stores – will also be used to:

- Adjust components based on the City-specific characterizations derived by the model; and
- Adjust components to reflect national trends in the intervening decade using available historical data – for example, the increase in plastics and the relative decrease in glass as a packaging material.

The characterization and quantification of waste generation provide a basis for estimating the quantity of commercial materials that are recycled. Recovery estimates will be developed from data in the Preliminary Report combined with new information obtained from large generators, recyclers, and end users (i.e., paper mills and dealers).

4.1.3 Collection Operations Assessments

The Preliminary Report estimated total tonnage from interviews with commercial carters. These interviews did not provide information on the number of collection vehicles dispatched by carters to the various boroughs or on the amount of waste generated in specific Community Districts. In this Subtask, the Consultant Team will use the results of a new survey now being

conducted by BIC of commercial carters operating in the City. The results will be evaluated to identify relevant information of collection route patterns, types of business served, quantities of waste collected and the location of garages from which vehicles are dispatched into the City.

The Consultant Team will seek similar information for all major carters operating in the City, identifying, for example, the location of vehicle staging areas (i.e., garages, yards), the number of vehicles operated, the time spent and the number of stops en route. The information obtained will be summarized in the Study.

Information regarding collection services in midtown and downtown Manhattan will be correlated with data regarding the type of business and level of employment in order to more accurately estimate waste generation. The goals of this approach are twofold: (i) to obtain an additional aggregate estimate of commercial waste and recyclables generated in Manhattan's business districts; and (ii) to obtain information concerning the routing of collection vehicles in these districts. The data collected in this Subtask will provide another source of verification of the waste generation estimates for the applicable Manhattan Community Districts developed in Subtask 4.1.2.

This Task will also seek to develop information on the quantity of commercial recyclables hauled by recyclers from commercial generators directly to local markets and/or dealers. These recyclers are not categorized as waste collection companies and their activities are neither regulated by DSNY nor recorded in DSNY reports.

4.1.4 Facilities Method

To develop more complete estimates of commercial waste carted out of the City for transfer or disposal, the Consultant Team will gather information from facilities located outside of the City that receive commercial waste. Transfer stations and waste-to-energy facilities in New Jersey, along with nearby facilities in Long Island and Connecticut, will be contacted. Data obtained from these contacts will be correlated with reports produced by the relevant state regulatory agencies to estimate the total in-City generated waste that is transferred or disposed of at out-of-City facilities.

4.1.5 Quantification of Construction and Demolition Waste and Fill

The Preliminary Report shows that C&D and fill material comprise the majority of commercially generated waste in the City. To effectively plan for adequate capacity for these materials over time, it is necessary to formulate a methodology to predict quantities of C&D and fill material. The Consultant Team will incorporate specific plans for major reconstruction, such as that which is planned for Lower Manhattan, in projecting levels of activity and consequent generation levels for C&D debris and fill material.

The Consultant Team will: (i) contact facilities that receive C&D and fill material, and obtain historic data to enable a calibration of the relationship between the level of construction activity and the quantity of materials generated; and (ii) interview officials of relevant organizations, including local organizations, such as the Associated General Contractors, regarding C&D generation. Data from non-City sources will also be collected to assess differences in generation rates between the City and other communities.

4.1.6 Projections of Commercial Waste for 2004 through 2024

The Consultant Team will use the data derived from Subtasks 4.1.1 through 4.1.5 as a base for the projections. Changes in total quantities generated and waste composition will be projected through 2024, based on best judgment, reasonable extrapolations of observed trends, and an assumed level of success in policies, such as waste reduction.

Forecasts of population and employment by Census Tract from 2000-2025 (in five year intervals) based on the 2000 Census are available from NYMTC, the Metropolitan Planning Organization (MPO) for the New York Region. The data have been adjusted by NYMTC to account for the shift in employment resulting from the disaster on September 11, 2001 and will be aggregated to Community Districts for use in projections of commercial waste. Note that work on NYMTC's expanded 2025 forecast (of age cohorts, labor rates, household size, and employment based on the North American Industrial Classification Standard code) will begin in mid-2003, but the forecast results will not be available for this Study. C&D debris and other inert

wastes will be projected separately over the 20-year horizon based on economic projections, incorporating expected variances resulting from, for example, reconstruction of the World Trade Center site, economic cycles, and expected regional growth.

Task 4.2 Assessments of Commercial Transfer Station Capacity

4.2.1 Siting Investigations in Lower and Midtown Manhattan for Additional Commercial Waste Transfer Capacity

To address public comments on the scope of the Study, an investigation will be conducted to identify and evaluate potential sites in lower and midtown Manhattan where commercial waste transfer facilities could be sited. Criteria for siting such facilities will be defined based on zoning, design and operational criteria, DSNY's Siting Rules (taking into account the potential for revision of these rules), consideration of potential environmental impacts and other applicable requirements. The Consultant Team will identify the minimum site size and related throughput capacity required for efficient waste containerization and transfer by barge or rail to out-of-City disposal facilities. Proximity and accessibility to intermodal yards will be considered. The Consultant Team will identify sites below 80th Street in Manhattan that meet these minimum criteria and will prepare conceptual designs to determine the additional transfer capacity potentially available at these sites. If no fatal flaws (that would prohibit such siting) are identified, an analysis of the advantages/disadvantages of potential sites will be performed.

4.2.2 Assessment of Containerizing Commercial Waste at the City's MTSs

As designs are developed to convert the City's eight MTSs (South Bronx, West 59th Street, East 91st Street, West 135th Street, Hamilton Avenue, Greenpoint, Southwest Brooklyn and North Shore) to containerization and container barge transfer facilities, the design capacity and site-specific conditions of the planned conversions will be evaluated for the potential to also process commercial waste. The Consultant Team will evaluate the potential quantity of commercial waste that could be accepted at each of the converted MTSs, in addition to DSNY-managed Waste, without causing unmitigatable adverse environmental impacts. The waste quantity data

developed in the Study (see Task 4.1) and the information developed for the Study Area Analysis (see Task 4.5) will be used to perform this analysis. Using updated methodologies and information from the 2000 Final Environmental Impact Statement (2000 FEIS) for the 2001 Comprehensive Solid Waste Management Plan Modification (2001 Plan), site-specific environmental reviews (traffic, on-site and off-site air quality and noise, on-site odor public health and neighborhood character) consistent with current SEQRA/CEQR requirements will be conducted at the eight MTS locations to identify the capacity of each MTS to accept an increment of commercial waste, without causing unmitigatable adverse environmental impacts. This environmental evaluation will have the following elements:

Engineering Capacity Analysis:

The capacity of each MTS to accept an assumed increment of commercial putrescible waste will be evaluated. An engineering analysis that is focused on design and operating constraints and site limitations will be performed for each of the eight MTSs to determine whether processing waste in excess of the quantities that are anticipated to be delivered by DSNY would be feasible. Based on DSNY's historical waste delivery patterns to the MTSs and assumptions on the delivery patterns of commercial waste and equipment throughput, the analysis will assess the hours of MTS operation during which the increment of commercial waste could be processed to avoid off-site queuing of waste delivery vehicles. Sufficient time will be allowed to containerize and load all waste received each day, considering available container storage capacity and barge shift time.

Site-specific environmental reviews (traffic, on-site and off-site air quality and noise and on-site odor) will be conducted at the MTSs to determine whether this increment of commercial waste would cause unmitigatable adverse environmental impacts. Existing conditions will be defined for 2003 (the year in which data is collected). Future no-build conditions will be characterized, including deliveries of DSNY-managed Waste to the MTSs under the long-term export program. Future build year conditions will be characterized by deliveries of commercial waste to the MTSs (in addition to DSNY-managed Waste).

Traffic:

The Consultant Team will perform a traffic analysis at key intersections to establish the impact of shifting private waste disposal to the MTSs. The traffic analysis will be performed as follows:

- Establish baseline conditions;
- Project numbers of commercial vehicles that would deliver waste to each MTS (based on available excess capacity);
- Assign trucks to the street network (commercial waste vehicles will be assigned to existing truck routes providing access to the MTSs – these commercial waste vehicle trucks will be added to the baseline traffic volumes at the Study intersections identified for each MTS); and
- Analyze the impact of the additional commercial waste vehicles. (The impact of sending commercial waste to the MTS will be quantitatively evaluated by performing a Highway Capacity Manual Software (HCMS) analysis at each of the study intersections, per CEQR criteria. Shift variability will be included in a qualitative discussion of potential reduction of private transfer station numbers and capacity.)

Air Quality (On-Site and Off-Site):

The on-site air quality impacts of the converted MTSs will be evaluated to address the additional equipment and modified facility operations required to accept commercial waste using the methodologies employed in the 2000 FEIS. On-site air quality sources will include: wheel loaders and forklifts from waste handling operations; tugboats delivering barges to and from the MTS; DSNY and commercial waste delivery vehicles queuing on-site; and waste delivery vehicles unloading in the MTS. Off-site air quality sources will be waste delivery vehicles (including both DSNY and commercial collection vehicles) that exceed screening criteria identified in the City CEQR Manual.

Odor (On-Site):

On-site odor sources will be limited to emissions from the addition of commercial waste handling operations in the MTS. Off-site odor sources will not be evaluated; vehicles will not idle at off-site locations for extended periods of time.

Water Quality:

For each proposed site, pollutant loadings for selected water quality parameters will be calculated for the addition of commercial waste. Runoff pollutant concentrations of pollutants will be determined through a review of available literature concerning solid waste management facilities or other industrial facilities and/or stormwater quality databases (e.g., USEPA's National Urban Runoff Program (NURP) database, etc.).

Noise (On-Site and Off-Site):

On-site noise sources will include: wheel loaders and forklifts from waste handling operations; tugboats delivering container barges to and from the MTS; compactors, gantry cranes, car pullers; and commercial waste delivery vehicles queuing on-site and operating in the MTS during unloading operations. Off-site noise sources will be waste delivery vehicles (including DSNY and commercial vehicles) that exceed screening criteria identified in the City CEQR Manual.

Public Health:

The Consultant Team will compare the potential public health impacts of MTS operations under no-build (i.e. without commercial waste) and build scenarios, preparing a non-site-specific analysis based on available published data and literature to describe the MTSs. The public health assessment will be performed in the same manner as the Study Area analyses. (See Section 4.5.1.)

Neighborhood Character:

Using available data from the current MTS EIS, neighborhood character will be described based on the area's characteristics, including: Land Use, Population Characteristics, Urban Design and Visual Quality, Parks and other Community Facilities and Cultural Resources. Neighborhood character will be further defined based on data and findings collected in the previous subtasks.

The overall effect on surrounding neighborhoods of commercial waste deliveries at the MTSs on the surrounding neighborhoods will be assessed based on the impact findings of the traffic, air quality, odor, water quality and public health studies. Consequences predicted as the result of work performed in Task 4.5 for Study Areas where the re-assigned commercial waste had been previously handled, will be discussed qualitatively, drawing on the conclusions identified during the traffic, air quality, odor, water quality and public health evaluations. These conditions will be compared to predicted conditions with only DSNY-managed waste handling at the MTSs.

Economic Factors:

The qualitative and, to the extent practical based on available data, quantitative economic impacts of the proposed regulatory and/or economic incentive mechanisms to encourage or require commercial carters to deliver waste to the MTS facilities will be assessed. Such mechanisms would include, under Section 16-201 of the New York Administrative Code, consideration of regulatory changes, such as transfer station permit sunset provisions or permit renewal/modification provisions that entail the concept of offsets; new legislation, such as “flow control;” a text amendment to the Zoning Resolution and application of the principle of “termination upon amortization,” as embodied in the Zoning Resolution. The assessment will also consider the possible effects of processing commercial waste at the converted MTSs on the commercial carting industry and its customers.

These findings will be reported in the Study.

Task 4.3 Evaluation of Waste Disposal Capacity Potentially Available to the City

At present, approximately two-thirds of DSNY-managed Waste that is exported from the City is disposed of in Pennsylvania. Using available data from state regulatory agencies, along with information from prior DSNY surveys, the Consultant Team will survey current trends in utilization rates, newly proposed facilities and permit renewal policies, in Pennsylvania and other states, to assess the potential volume and location of disposal capacity that could be available for

disposal of both DSNY-managed and commercial waste generated in the City, during the 20-year New Plan period. The assessment will also consider competing demands for this capacity.

For the purpose of this assessment, the availability of landfill and waste to energy capacity is defined as the volume of out-of-City waste disposal capacity that is economically accessible by export from the City. Estimates of the available disposal capacity, supply, demand and prevailing market prices within a defined service area will be made. This analysis will be used to project the waste disposal capacity available to the City over the planning period and to estimate the cost of transporting and disposing of commercial waste generated within the City.

The service area to be studied will be defined to limit the assessment to states that can be reasonably accessed from the City by truck transfer, ocean-going vessel transport and rail. The results of prior DSNY surveys will initially define a “preliminary” Study Area. Potential redefinition of the service area will be evaluated throughout the Study and will be based upon reasonable truck, rail and shipping routes and expected economic breakpoints.

Disposal capacity available to the market area may increase over time as demand increases. The trend in the industry has been for the major waste companies to develop mega-regional landfills. These landfills are usually located in remote areas. The assessment will evaluate, within the service area, the balance of the supply and demand for disposal capacity.

Estimates of the cost of exporting commercial waste will be developed, if sufficient data is available, using the following three methods: (i) reviewing historical market price survey data; (ii) estimating the “willingness to pay” of competing users for this disposal capacity; and (iii) conducting an econometric model study of supply and demand relationships in the service area.

Available data on historic market prices in the survey area will be reviewed. Although historical market prices may not reflect future prices, the data obtained may reveal some simple trends and will form a basis for the more detailed analyses. This information will be used to estimate the amount each major demand center would be “willing to pay” for disposal capacity.

Econometric analyses (e.g., multi-linear regression) are routinely used to project future market prices as supply, demand or other exogenous variables change. To obtain statistically significant results, this approach requires a relatively large and reliable database. An econometric model approach will be formulated and an assessment made of whether the reasonably available data can be used to obtain meaningful results. If so, the econometric model will be used to project future market conditions.

The findings from this investigation will be reported in the Study. Based on these findings, the Consultant Team will also assess the need and related timing for development of additional intermodal waste transfer capacity in or readily accessible to the City to achieve more favorable waste transport economics to remote disposal capacity.

Task 4.4 Assessment of the Potential Impacts of the Relative Concentrations of Commercial Waste Transfer Capacity

In up to four locations in the City (two in the Bronx and one each in Brooklyn and Queens) where commercial waste transfer stations are currently most concentrated, a “Study Area” Analysis will be performed. A “top down” evaluation methodology will be used to determine existing conditions for: (i) traffic, mobile air quality and mobile noise at key intersections along major corridors leading to and from Study Area locations; and (ii) odor and noise from transfer stations located within each Study Area at nearby sensitive receptors.

Existing conditions will be defined through data collection during 2003. Reference may also be made to criteria based upon CEQR thresholds for traffic, noise, air quality and odor as a possible means of assessing whether potentially adverse impacts can be attributed to the concentrations of transfer stations in the Study Areas. As background information, the Study will provide an inventory of as-of-right land uses in manufacturing zones (M-zones).

This assessment will evaluate the impacts of the transfer stations on the Study Area as compared to impacts from alternative industrial uses on the transfer station sites. Existing conditions will be evaluated in the Study Area (with the transfer stations in place) in terms of traffic, air quality

and the other applicable Study Area criteria. A hypothetical existing condition would then be defined by "backing out" the transfer station's impacts from the Study Area, assuming that the existing transfer station sites would be occupied by other M-zone land uses typical of existing conditions in the Study Area. The traffic, air quality and other analyses would then be recalculated. The comparative effects on Study Areas with existing transfer stations and with alternative, as-of-right, M-zoned land uses would be determined by comparing the two analyses.

4.4.1 Study Area Evaluations

The Consultant Team has identified those areas where transfer stations are currently most concentrated; Hunts Point and Port Morris in the Bronx, Greenpoint/Williamsburg in Brooklyn and Jamaica in Queens. These will constitute the Study Areas. The Consultant Team will also identify the locations of commercial waste hauling vehicle storage yards and garages through information provided by the Business Integrity Commission.

Traffic Evaluations:

A traffic analysis will be performed at key intersections in each of the Study Areas to establish the impact of transfer station concentrations on the Levels of Service (LOS) on major roadways.

A traffic analysis methodology will be developed for the following areas:

- Agreement on operational standards: CEQR traffic assessments typically measure an individual's incremental impact on average driver delay. However, when evaluating the combined effect that transfer stations have, criteria designed around the incremental impacts of a single event are inappropriate. The development of an absolute standard will thus be attempted to assess the traffic impact on acceptable LOS for an intersection approach and individual movements that have a significant adverse impact.
- Select study locations: Analysis intersections will be selected on major truck routes accessing the Study Area locations.
- Classifications for counts: Turning movement counts will be performed at each analysis intersection. At 16 of the 20 intersections, vehicle classifications will consist of auto, non-waste truck and two categories of waste-related trucks (packer and long distance). Six of each set of 20 intersections are assumed to be air quality study locations. At these intersections, the traditional seven-way classification will be supplemented by the two categories of waste-related trucks.

- Hours for counts: The counts will be performed for one weekday with Automatic Traffic Recorder (ATR) counts or three weekdays (Tuesday through Thursday) with one two- to three-hour period in the morning and one two- to three-hour period midday or evening/night.
- Analysis of existing conditions: Existing conditions will be analyzed using the Highway Capacity Manual Software (HCMS). This condition will represent the “impacted” condition for the transfer station Study Areas.
- Analysis of effects of commercial waste vehicles: Based on the detailed classification counts performed, the effects of adding back the commercial waste vehicles (net of the vehicles resulting from the replacement of the assumed land uses) will be analyzed.

Air Quality Evaluations:

Off-Site Operations – The modeling procedures used in the 2000 FEIS will be used for this analysis. Critical intersections will be selected in the four Study Areas for air quality analysis based on traffic volumes, LOS, and locations of sensitive land uses. Air quality levels, based on regulatory standards, will be estimated near each of the critical intersections using actual traffic data and roadway configurations.

Pollutant concentrations estimated at selected intersections within each geographic area will be compared with applicable ambient air quality standards.

On-Site Operations – Analyses will be conducted for facilities located within a specified distance of other transfer stations at four Study Area locations. Up to three facilities per Study Area will be evaluated. Site-specific emission-related data (i.e., stack emission rates and parameters, truck operations, etc.) will be developed from a combination of available information (e.g., owner or vendor information, and NYSDEC or New York City Department of Environmental Protection records for permitted facilities, etc.) and assumptions based on each facility’s size and operations. Assumptions will be made regarding the simultaneous operation of all applicable emission sources. Air quality levels at receptor sites (i.e., site boundary locations and sensitive receptor locations identified from land use maps and field observations) potentially affected by the combined emissions of adjacent facilities will be calculated. Following CEQR guidelines, emissions from other major commercial or industrial sources (i.e., other than transfer stations) located within 400 feet of these Study Areas will be considered in these analyses.

Odor Evaluations:

Emission factors for the major odor sources will be developed using the same procedures that were used in the 2000 FEIS (i.e., sampling at source locations representative of emissions from each type of transfer station [putrescible, non-putrescible, fill material], as appropriate, dispersion modeling based on data developed through odor assessment methodologies. Assumptions will be made as to the simultaneous operation of emission sources from more than one facility, and these sources will be considered in the same modeling runs. Odor levels at receptor sites (i.e., site boundary locations and sensitive receptor locations identified from land use maps and field observations) that may be affected by the combined emissions of adjacent facilities will be estimated. The distance between facilities within a Study Area will be the same as that established for the on-site air quality analysis.

Water Quality Evaluations:

Cumulative impacts to water quality due to the grouping of commercial waste transfer stations will be evaluated. Individual transfer stations within a Study Area will be evaluated using readily available information from DSNY or the facilities (if directed by DSNY), to determine the disposition of wastewater and stormwater at these sites. A conservative analysis will then be conducted to evaluate the potential impact of transfer station operations in these Study Areas upon surface water quality. For each facility evaluated within a Study Area: (i) The volume of stormwater runoff and the associated pollutant loading from the facility will be calculated using precipitation data and available databases on stormwater pollution concentration; and (ii) the estimated pollutant loading for each site within a Study Area will be developed by calculating the runoff flow and assigning an average stormwater concentration for each water quality parameter of concern. For each site evaluated, pollutant loadings for selected water quality parameters will be calculated by assigning a pollutant concentration to the runoff flow, as determined through a review of available literature concerning solid waste management facilities or other industrial facilities and/or stormwater quality databases (e.g., NURP database, etc.). The estimated pollutant loading for each site within a Study Area will be developed by calculating the runoff flow and assigning an average stormwater concentration for each water quality parameter of concern. Runoff flow will be calculated from the facility footprint, the average

rainfall intensity (inches/hour) and an applicable runoff coefficient. Estimates of the footprints of the individual transfer stations within each Study Area will be prepared from available drawings, permit applications submitted to the DSNY or aerial photographs.

The impacts to water quality associated with the transfer stations within these Study Areas will then be determined through an evaluation of the total pollutant loading associated with all of the facilities within a Study Area and their discharge to surface waters. Potential cumulative impacts due to the operation of multiple facilities within a given Study Area will be estimated by combining the incremental difference in water quality calculated by the model with existing water quality data, comparing these with NYSDEC water quality standards and discussing whether the pollutant loading is significant.

Noise Evaluations:

Off-Site Operations – Off-site operations are principally related to noise generated from transportation of waste material by heavy trucks to and from the facilities. The potential noise sensitivity of receptors located along Study Area-related routes will determine the magnitude and extent of the noise impacts from heavy truck operations. The noise analysis approach will include performing noise monitoring at selected sites and making detailed noise predictions at a number of other sensitive sites to establish baseline conditions. The noise predictions will utilize the latest Federal Highway Administration (FHWA) TNM 2.0 model. The results from monitoring and modeling will be used in the noise impact assessment, which will follow CEQR and FHWA procedures and regulations. Noise monitoring will be performed at the selected sensitive sites during the peak truck traffic hour using calibrated noise measuring equipment. Noise readings will be taken at the free flowing sections of roadways under low wind speed and dry road surface conditions.

Standard procedures will be followed during noise monitoring. Following standard practice, traffic noise impacts will be assessed when the vehicle/roadway noise emission levels are at their maximum and the roadway noise includes noise contribution from Study Area-related trucks. Major truck routes leading to the Study Areas will be identified and traffic counts near sensitive

land uses where monitoring and modeling were performed will be utilized. The traffic counts will include total vehicle counts and specific data on DSNY and commercial waste transfer trucks, speeds, and classification of the type of vehicle (i.e., cars, medium trucks with two axles and six wheels, and heavy trucks with more than two axles). The noise contribution from Study Area-related trucks will be calculated based on monitored and modeled data and from existing truck traffic volume data.

On-Site Operations – On-site noise is generated largely from stationary equipment operations within each facility. The potential impact of transfer stations within a Study Area depends on the types and number of stationary sources operating within the Study Area. As there are no screening procedures available to evaluate noise from the transfer stations within a Study Area, the noise model previously developed by the Consultant Team, and utilized to predict stationary source noise levels from containerization facilities in the 2000 FEIS, will also be employed here. An inventory of equipment from each facility in the Study Area will be obtained or assumed. Noise emission levels of each equipment type within each facility will be obtained either from on-site measurement or from manufacturer's data. The noise model will be used to plot 55 dBA noise contours around each facility, taking into account existing screening, the contours from all of the facilities in a Study Area will be combined to obtain cumulative noise from the entire Study Area. Impact determination will be based on the size of the composite contour, the Noise Code and the Zoning Code Standards and the sensitivity of encompassed land uses.

Public Health Evaluation:

Health impacts of data collected during earlier phases of this Subtask and other publicly available data for the Study Areas and in the published literature will be synthesized and assessed. Specifically, the analysis will on a non-site specific basis will address the dilution of odors with distance from transfer stations at the nearest sensitive receptor, the modeled incremental contributions of vehicle emissions to ambient carbon monoxide and particulate matter concentrations in air along major thoroughfares near and/or in each Study Area, and the modeled incremental noise levels along routes and at the nearest sensitive receptor. Impacts of on-site operations on air quality, modeled by each facility, will also be collected.

Measured and modeled impacts of transfer station operations will be evaluated in light of: (i) local, state, or federal standards (where available); and (ii) scientific literature pertaining to the health effects associated with ambient carbon monoxide and particulate matter, obnoxious odors, noise and MSW.

Neighborhood Character Evaluations:

Using available sources (including the SWMP FEIS) generalized data will be gathered for each Community District where the concentrations are located. Contributing factors include: Land Use, Population Characteristics, Urban Design and Visual Quality, Parks and other Community Facilities and Cultural Resources. Neighborhood character will further be defined based on existing traffic, air quality, odor, water quality and public health findings defined in the previous subtasks. The distance of each transfer station from the nearest residential district will be presented.

Potential changes to neighborhood character will then be qualitatively evaluated under various conditions (as described in the Traffic Evaluation Scope above) such as: with operational adjustments made to existing transfer stations; with commercial waste trucks removed and replaced with other hypothetical trucks generated by non-waste uses that could be potentially developed under current zoning; and with some of the commercial waste trucks and operations removed, as may be required to ensure Study Areas operate within CEQR impact thresholds and performance standards). Given these conditions, the neighborhood character will be described as to whether it would likely change or improve, or remain the same as with existing conditions and how these conditions compare to CEQR standards.

4.4.2 DSNY Siting Rules Assessment

The results of the Study Area Analysis will be further evaluated to determine what, if any, revisions should be considered in DSNY's 1998 Transfer Station Siting Rules and permitting requirements. This assessment will focus on ascertaining the potential effects of modifying the Siting Rules or permit requirements to mitigate potential adverse impacts associated with the future siting of new transfer stations. This assessment will consider the findings of the Study

Area Evaluations Tasks in formulating and testing the applicability of siting policies that would: (i) mitigate the potential for an undue concentration of facilities in a given community; and (ii) achieve a more equitable distribution of facilities in manufacturing zones consistent with zoning and other applicable regulatory standards, taking into account the purpose of the zoning resolution to site industrial uses in defined districts.

The evaluation for the potential siting of new commercial waste transfer stations in the City will require the generation and incorporation of numerous data layers into the GIS database. These layers include, but are not limited to, zoning, parks and sensitive receptors. The Consultant Team will use numerous public and private data sources and, as necessary, verify data through field investigations as appropriate for applicability of siting rule restrictions. The Siting Rules will be used as the basis to develop specific criteria to buffer, edit, analyze and query the GIS database. This analysis will allow a visual representation of how the Siting Rules affect the existing transfer stations and what potential areas would accept development of new commercial waste stations without violating existing Siting Rule restrictions and will note factors that typically drive siting decisions, such as access to rail and highways.

4.4.3 Mitigation Summary

The Consultant Team will summarize the results of the Study Area analyses to determine the need for new mitigation policies. The Consultant Team will summarize findings from air, odor, noise, water quality, traffic, economic impact, public health, and neighborhood character evaluations in the Study Area analyses. Possible mitigation strategies will be outlined and evaluated to develop measures that can be instituted by modifying existing policies, practices and regulations.

Mitigation strategies that might be considered for re-permitting of existing or siting of new commercial waste transfer station permits or expansions may include: (i) requiring new transfer station owners to make or fund certain improvements (i.e., intersection improvements, such as lane striping, signals and signs) in the immediate vicinity of the proposed facility or within the Study Area prior to development of a new transfer station; (ii) obtaining air quality offsets by

closing other existing commercial waste transfer stations under the same ownership or by other offsets resulting in an overall zero net air quality impact; (iii) limiting the number of waste hauling vehicles along specific roadways during certain periods of time; and (iv) designating specific intersections or routes to be avoided.

Task 4.5 Assessment of the Design and Operation of Existing Commercial Transfer Stations

A field survey will be conducted to assess the design and operation and compliance with applicable zoning standards of a select sample of existing putrescible, C&D and fill material commercial waste transfer stations. The purpose of the field survey is to identify potential changes to facility designs (i.e., perimeter fencing, on-site queuing space, exhaust controls, etc.) and/or operational practices (waste storage and handling, locations of equipment, hours of operation, etc.) that would mitigate the potential for impacts to nearby communities. The recommended design and/or operational changes may be proposed for consideration as recommended policy measures that would modify the regulatory requirements for permitting existing, modified or new transfer stations in the City.

A survey checklist will be prepared to identify design and operational parameters to be reviewed during each visit. The survey checklist will include parameters that are required by City and State regulations governing solid waste and C&D transfer stations, including zoning standards, and additional parameters that, if implemented, would improve the conditions of the facility and its potential impact on the surrounding community. During the field survey, information reported on the Department's Quarterly Reports will be compared to observed conditions (e.g., use of scales) and scale records maintained by the facility to assess the relative accuracy of reported information. Up to 20 transfer stations will be visited with DSNY Permit Inspection Unit personnel. Once checklists are completed for each location, the data will be summarized and assessed to identify common design or operational parameters that are present at each type of facility, and those that are not present, that could result in an improvement to the community. Unit pricing and a range of comparative costs for improvements will be prepared.

Task 4.6 Evaluation of Permitting and Enforcement Effectiveness in Regulating Commercial Waste Collection and Transfer Operations

This Subtask focuses on the detailed analysis of existing State, City and DSNY controls on commercial carting and transfer station development and evaluation of the enforcement of current policies. The Consultant Team will research current policies governing the issuance of permits and the existing practices regarding the evaluation of their impacts. This work will initially inventory the responsible agencies and the respective authority they exercise over the commercial carting industry, waste set-out, and the siting, design, construction and operation of transfer stations. The key regulatory mechanisms are: (i) DSNY Siting Rule requirements and NYSDEC's Part 360 Solid Waste Facility Permits for new and expanded or modified transfer stations; (ii) Zoning Performance Standard requirements; (iii) DSNY Permitting Regulations; and (iv) City DOT Traffic Regulations.

Studies of the effectiveness of enforcement of applicable regulations will be performed to identify gaps in enforcement coverage. The Consultant Team will describe the existing enforcement structure, including: (i) lines of responsibility for enforcement activity within an agency and among several agencies within similar enforcement responsibilities (including DSNY, the City Departments of Buildings, Transportation, and Health, the Business Integrity Commission, and the Police Department – the areas of responsibility and the extent of coordination with other agencies will be noted); (ii) offenses for which summonses may be issued (for each agency, the specific regulations enforced will be listed along with the types of penalties that are associated with particular violations); (iii) analysis of DSNY summons history; and (iv) complaints received from the public. (A limited research effort of DSNY and Environmental Control Board records will be undertaken. The purpose will be to determine the most common types of summonses issued to commercial waste generators, carters and transfer stations, the frequency of violations averaged at transfer stations, and the number of violations typically issued during a single inspection by DSNY personnel.)

The Consultant Team will evaluate enforcement practices, for deficiencies, which may include: (i) gaps in line of responsibility or offenses not addressed; (ii) the need for in-the-field monitoring and measurement technology (i.e., noise meters) to document violations; and (iii) the

lack of deterrence resulting in repeat offenders. The Consultant Team will test the extent of impacts due to the limitations of the enforcement program (e.g., agent training in use of noise meters and dust sampling equipment) and a lack of enforcement in the field at select locations. The testing program will be structured as follows:

- **Select Test Criteria:** In consultation with DSNY, the Consultant Team will select criteria (grouped according to regulatory agency) to be finalized in consultation with DSNY. The recommended criteria should include: (i) conformance to limits on hours and operating requirements; (ii) compliance with enclosure restrictions; (iii) noise levels; (iv) adherence to truck routes; and (v) compliance with restrictions on off-site queuing, idling and parking.
- **Select Test Locations:** Test locations will be based on a review of the violation data compiled as a result of this Task.
- **Sample Transfer Station-Related Violations:** Visits will be made on two separate days to each of the sample transfer stations. Notes will be made if previously cited violations still exist.
- **Sample Truck Route Violations:** Along major roads leading from the Study Area into or through a residentially zoned area, but which are not designated truck routes, classification counts will be performed to determine the presence of commercial waste-related trucks and other industry trucks. One day of traffic counts will be performed at five intersections per Study Area. The counts will be performed at the two major approaches of each intersection.

An Enforcement Effectiveness Report will be prepared with findings regarding any perceived gaps in enforcement procedures and the extent and nature of any other enforcement deficiencies. Potential modifications to enforcement procedures will be identified, including procedures that may be directed at facility owners/operators who have carter customers with a significant history of repeated violations by, for example, restricting the receipt of waste from these carters.

Task 4.7 Evaluation of Alternative Collection Vehicles

Under almost any scenario for the future, the movement of solid waste in the City will remain heavily dependent upon diesel-powered trucks. The ideal and most effective measure to reduce air pollution would be to reduce the emissions by these trucks. The main objective of this Task is to determine if particulate traps, alternate fuels or truck types might be feasible and lawful

means of reducing truck emissions. In consultation with DSNY, which has extensive experience in testing alternative fuels and emissions control equipment on its collection fleet, the Consultant Team will provide an overview of the different options for alternative fuels and vehicle types/retrofits. The focus will be on proven technologies and vehicle types. If regulations are to be imposed or incentives provided, they must represent realistic emission reduction technology and options that would not create undue hardship for truck fleet operators. The two initial review components are as follows:

- Alternative Fuel Options: At the present time, all of the vehicles transporting private waste in the City are powered by either gasoline or diesel fuel produced from petroleum. In recent years, several alternate fuels have been explored; none, however, have been found to be acceptable replacements for gasoline and diesel-fueled vehicles. The options with the most potential for efficient and cost effective emission reductions will be evaluated. The Consultant Team will review the: (i) ability of existing vehicles to be retrofitted with devices that reduce emissions; (ii) safety; (iii) ease of use; (iv) power output of alternative fuels, such as natural gas, methanol, ethanol; (v) the impact of USEPA-proposed and promulgated regulations mandating cleaner burning diesel engines and the use of certain fuels in vehicles; and (vi) the availability of alternative fuel stations. The Consultant Team will also address the use of biodiesel fuels, including the potential generation of biodiesel from putrescible waste.
- Vehicle Size Alternatives: Currently, vehicles hauling private waste in the City vary in size from small, two-axle, six-wheel vehicles to large, articulated 18-wheelers. This alternative will seek to evaluate if one or a variety of sizes of trucks could better serve communities by balancing air quality, noise, and congestion issues with economic feasibility. The analysis will focus on whether regulation of carter vehicle fleets, much like the regulation of City taxi fleets, would yield any environmental or economic benefits over the present system. If standard fleets are used, they may facilitate regulation and streamline inspection of vehicles, which may, in turn, yield a cost savings to the City.
- Noise Suppression Technology: The availability of equipment designed into vehicles and add-on devices that reduce vehicle noise in collection and transfer operations will be investigated. The effectiveness and cost of using this equipment in waste collection and transfer operations will also be assessed.

An evaluation will be performed to determine if a particular type or types of vehicle would be more economically and environmentally feasible. To assess whether alternatives can be implemented, the following will be examined:

- Regulatory Options: The regulatory framework presently in place to license and inspect vehicles and operators hauling trade waste in the City will be analyzed to determine where regulations on fuel type could best be introduced and the procedures for the introduction of those changes.
- Institutional Barriers: The Consultant Team will explore institutional barriers that may pose problems with introducing new legislation or rules.

Task 4.8 Findings and Recommendations

Findings from each of the Tasks completed in the Study will be summarized in a detailed Report. This Report will also identify recommendations for policy strategies that may be implemented by DSNY or proposed for adoption in the New Plan. Results of the Study and recommended policy strategies will be included in the Study Report.