

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

New York City Department of Sanitation

JULY 31, 2003

TABLE OF CONTENTS

1.0	INTRODUCTION	1
1.1	Summary of Objectives.....	7
1.1.1	Requirements of Local Law 74 of 2000, New York Administrative Code §16-134	7
1.1.2	Other Study Objectives	8
1.2	Scope Organization.....	9
2.0	SUMMARY OF ISSUES TO BE ADDRESSED	10
3.0	TASK OVERVIEW	12
4.0	Detailed Scope of Work	17
Task 4.1	Quantification of Commercial Waste	17
4.1.1	Adjustment of Preliminary Report Data	17
4.1.2	Employment-Based Waste Estimation Model	17
4.1.3	Collection Operations Assessments	18
4.1.4	Facilities Method	19
4.1.5	Quantification of Construction and Demolition Waste and Fill	20
4.1.6	Projections of Commercial Waste for 2004 through 2024	20
Task 4.2	Assessments of Commercial Transfer Station Capacity	21
4.2.1	Siting Investigations in Lower and Midtown Manhattan for Additional Commercial Waste Transfer Capacity	21
4.2.2	Assessment of Containerizing Commercial Waste at the City’s MTSs	21
Task 4.3	Evaluation of Waste Disposal Capacity Potentially Available to the City	25
Task 4.4	Assessment of the Impacts of the Concentration of Commercial Waste Transfer Capacity.....	27
4.4.1	Study Area Evaluations.....	28
4.4.2	DSNY Siting Rules Assessment	33
4.4.3	Mitigation Summary	34
Task 4.5	Assessment of the Design and Operation of Existing Commercial Transfer Stations.....	35
Task 4.6	Evaluation of Enforcement Effectiveness in Waste Collection and Transfer Operations	36
Task 4.7	Evaluation of Alternative Collection Vehicles	37
Task 4.8	Findings and Recommendations	39

**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.