3.17 AIR QUALITY

3.17.1 INTRODUCTION

The proposed development would include up to approximately 1.7 million square feet of mixed-use development, including up to 1,000 dwelling units and a mix of retail, office and cultural space, as described in Chapter 2.0. The development would be located on three land parcels on blocks 1791, 1790, and 1789, described as Parcel A, Parcel B and Parcel C, respectively, that are generally bounded by 127th to the north, 125th to the south, Second Avenue to the east and Third Avenue to the west. In addition, the proposed East 125th Street Development proposed action includes two underground parking garages on Parcel A and Parcel B, as well as an additional underground MTA bus parking garage on Parcel A.

An alternative to the proposed action, referred to as the MTA Bus Depot Expansion Alternative, is described in Chapter 3.21. This alternative would include generally similar development on the project site on Blocks 1789, 1790, and 1791, with the exception of the underground bus storage space, which would be located offsite, in an expanded three-story MTA Bus Depot that is currently only one-story in height (Block 1803, located at 2460 Second Avenue).

Air quality issues associated with the proposed development relate to the following:

- Potential for increases and/or changes in vehicular travel associated with the proposed development to result in significant mobile source air quality impacts;
- Potential for emissions from the underground Metropolitan Transit Authority (MTA) bus garage located on the footprint of Parcel A.
- Potential for the emissions from the heating systems of the proposed development to significantly impact sensitive land uses;
- Potential of existing large-scale commercial, institutional or residential developments to impact the buildings of the proposed action.
- Potential for proposed action development onsite to be adversely affected by air toxic emissions generated by existing nearby industrial and commercial uses (including the 126th Street MTA bus maintenance facility in the Proposed Action).

Air quality analyses were conducted, following the procedures outlined in the New York City *2001 CEQR Technical Manual*, to determine whether the proposed action would result in violations of ambient air quality standards or health-related guideline values. The methodologies and procedures utilized in these analyses along with corresponding results tables are described below.

Project Summary

Increases in mobile source emissions of CO, $PM_{2.5}$ and PM_{10} related to increases in project-induced traffic would not result in any exceedances of the National Ambient Air Quality Standards (NAAQS) or the DEP/DEC NYC interim guideline impact criteria at existing or future project-related sensitive receptors. Pollutant emissions of SO_2, $PM_{2.5}$ and PM_{10} related to the proposed developments HVAC systems and the proposed bus garage would not result in any violations of applicable NAAQS standards or exceed the DEP / DEC NYC interim guideline incremental impact criteria. Existing pollutant sources would not result in any air quality related impacts of the proposed development. Existing large scale pollutant sources, in addition to industrial sources that would emit air toxics, would not result in any significant adverse impacts at any of the sensitive land uses that would be created by the proposed action.

Pollutants of Concern

Criteria Pollutants

The following air pollutants have been identified by the U.S. Environmental Protection Agency (USEPA) as being of concern nationwide: carbon monoxide (CO), nitrogen oxides (NO_x), photochemical oxidants, particulate matter (PM), sulfur dioxide (SO_2), and lead (Pb). In New York City, ambient concentrations of CO and photochemical oxidants are predominantly influenced by motor vehicle activity; NO_x are emitted from both mobile and stationary sources; emissions of SO_2 are associated mainly with stationary sources; and emissions of particulate matter are associated with stationary sources, and to a lesser extent, diesel-fueled mobile sources (heavy trucks and buses). Lead emissions, which historically were principally influenced by motor vehicle activity, have been substantially reduced due to the elimination of lead additives in gasoline.

Carbon Monoxide

Carbon monoxide is a colorless, odorless, and toxic gas that results primarily from the incomplete combustion of fossil fuels. Particularly sensitive to its effects are infants and elderly persons, as well as other individuals who suffer from respiratory diseases. In New York, more than eighty percent of all CO emissions are the result of motor vehicle exhaust. Roadways that experience high vehicular volumes, low travel speeds and traffic congestion, result in conditions that are often associated with high CO concentrations. The implementation of the proposed project could exacerbate traffic conditions within the already heavily congested 126^{th} Street, 125^{th} Street, First Avenue, Second Avenue and Third Avenue corridors. As a result, CO is a pollutant of concern for this project.

Nitrogen Oxides and Photochemical Oxidants

Nitrogen dioxide is formed from the burning of fossil fuels and is considered a highly reactive gas that is also linked to the production of acid rain. Nitrogen dioxide and photochemical oxidants such as ozone (O_2) are linked in that the production of NO_2 is a precursor to the formation of O_2. Because the chemical reactions that form O_2 occur slowly and ordinarily take place far downwind from the site of actual pollutant emission, the effects of the pollutants involved are usually analyzed on a regional level. New York County is currently designated as a moderate non-attainment zone for the 8-hour standard; however, since the proposed development would not significantly affect the amounts of these pollutants generated within the region, an analysis of these pollutants is usually not warranted. In addition, since the proposed development would use fuel oil for its HVAC systems, NO_2 is not a pollutant of concern. However, an analysis of the existing MTA bus maintenance garage that uses natural gas for its heating systems was conducted to determine whether it could have a potential impact on the proposed development.

Particulate Matter

Inhalable particulate matter (PM) is a respiratory irritant and is of most concern when classified as being less than 10 microns in diameter, or PM_{10}. Particulate matter is primarily generated by stationary sources, such as industrial facilities and power plants but is also emitted by vehicle exhaust (particularly from Heavy Duty Diesel Vehicles (HDDV). Emissions could also be derived from the mechanical breakdown of coarse particulate matter, e.g., from building demolition or roadway surface wear as well as construction-related activities. With respect to the proposed development, it was conservatively assumed, for purposes of the analysis that the HVAC systems would use No. 2 fuel oil. In addition, the operation of the MTA Bus Depot Expansion Alternative would result in exhaust emissions from diesel-fueled buses from on-street movement and the mechanical venting of the bus facilities (related to the movement of buses in an enclosed, below grade environment). As a result PM_{10} would be a pollutant of concern.

The USEPA has also promulgated standards for PM less than 2.5 microns in diameter ($PM_{2.5}$). While $PM_{2.5}$ and PM_{10} both emanate from similar sources, $PM_{2.5}$ of "fine particulates are considered the most damaging to human health because they penetrate and remain in the deepest passages of the lungs." In addition to health effects, it has been shown that fine particles are the major cause of visibility impairment within major urban landscapes. At the present time New York City is recognized as a non-attainment area for this pollutant. To assist in the prediction of potential impacts, the New York State Department of Environmental Conservation (NYSDEC) and New York City Department of Environmental Protection (NYCDEP) have developed and recently updated interim guidelines (July 9, 2007) for the screening and assessment of potential project-related $PM_{2.5}$ emissions. The mobile source screening portion of the guidelines requires that a calculation of HDDV screening threshold be conducted for the particular project build year. For the proposed development, the results of the calculation indicated that 39 HDDV's (trucks and buses or their emissions equivalent in autos) at an intersection during a peak hour would have the potential to cause adverse air quality impacts from $PM_{2.5,}$ and require a detailed analysis. As there is a potential that the proposed development would generate more than 39 HDD's at an intersection, $PM_{2.5}$ is a pollutant of particular concern.

Sulfur Oxides

Oxides of sulfur (SO_2) are respiratory irritants associated with the combustion of sulfur-containing fuels (such as heating oil and coal). SO_2 is a precursor to acid rain and to $PM_{2.5}$, both of which create damage to the health of individuals and the environment. This pollutant is typically associated with large industrial operations but can also result from much smaller sources. In urban areas, especially in the winter, smaller stationary sources such as HVAC systems contribute to elevated SO_2 levels. However, all NYSDEC sulfur dioxide monitoring sites have remained in compliance with the New York State/Federal annual mean standard for over twenty consecutive years. As the heating systems of the proposed developments would use No. 2 fuel oil, SO_2 is a pollutant of concern.

<u>Lead</u>

Lead emissions are principally associated with industrial sources and motor vehicles using gasoline containing lead additives. As the availability of leaded gasoline has decreased, motor vehicle-related lead emissions have decreased, resulting in a significant decline of concentrations of lead. Atmospheric lead concentrations in New York City are well below national standards. Lead concentrations are expected to continually decrease; and as a result lead is not a pollutant of concern for the proposed project.

Air Toxic Pollutants

In addition to the criteria pollutants mentioned above, small quantities of a wide range of non-criteria air pollutants (known as air toxic pollutants), which are emitted from nearby industrial and commercial facilities, are also of concern. These pollutants can be grouped into two categories: carcinogenic air pollutants, and non-carcinogenic air pollutants. These two groups include hundreds of pollutants, ranging from high to low toxicity. No federal standards have been promulgated for toxic air pollutants. However, USEPA and NYSDEC have issued guidelines that establish acceptable ambient levels for these pollutants based on human exposure criteria.

In summary, the air pollutants identified as being of concern are considered as follows:

- CO, PM_{10} and $PM_{2.5}$ are pollutants of concern for the mobile source analysis for both the proposed action and the MTA Bus Depot Expansion Alternative because of the additions and/or changes in local vehicular traffic that are anticipated as a result of the proposed action;

- SO_2, PM_{10} and $PM_{2.5}$ are pollutants of concern for the air quality analysis of emissions from the heating systems of the proposed action. This also includes PM emissions from the proposed MTA Bus Depot Expansion Alternative; and

- Air toxic emissions from existing industrial/manufacturing land uses are considered to determine the potential for significant impacts the proposed development action.

Air Quality Standards and Guidelines

Air Quality Standards

National and New York State primary and secondary ambient air quality standards (NAAQS) are pollutant concentration limits for each of the criteria pollutants specified by EPA. Primary standards were promulgated to protect human health. The goal of secondary standards is to protect the nation's welfare and account for the effect of air pollution on soil, water, vegetation and other aspects of general welfare. Time frames for exposure, based on how these pollutants adversely affect health, have also been established for these pollutants. These standards, together with their health-related averaging periods, are presented in Table 3.17-1.

Table 3.17-1: Ambient Air Quality Standards

Pollutant	Standard Value		Standard Type
Carbon Monoxide (CO)			
8-hour Average[1]	9 ppm	(10 μg/m^3)	Primary
1-hour Average[1]	35 ppm	(40 μg/m^3)	Primary
Nitrogen Dioxide (NO_2)			
Annual Arithmetic Mean	.053 ppm	(100 μg/m^3)	Primary & Secondary
Ozone (O_3)			
1-hour Average[1,6]	.12 ppm	(235 μg/m^3)	Primary & Secondary
8-hour Average[5]	.08 ppm	(235 μg/m^3)	Primary & Secondary
Lead (PB)			
Quarterly Average	1.5 μg/m^3		Primary & Secondary
Particulate (PM_{10})			
Annual Arithmetic Mean	(Revoked)[2]		Primary & Secondary
24-hour Average[1]	(150 μg/m^3)		Primary & Secondary
Particulate ($PM_{2.5}$)			
Annual Arithmetic Mean[3]	(15 μg/m^3)		Primary & Secondary
24-hour Average[4]	(35 μg/m^3)		Primary & Secondary
Sulfur Dioxide (SO_2)			
Annual Arithmetic Mean	.03 ppm	(80 μg/m^3)	Primary
24-hour Average[1]	.14 ppm	(365 μg/m^3)	Primary
3-hour Average[1]	.50 ppm	(1300 μg/m^3)	Secondary

1 - Not to be exceeded more than once per year
2 - As of December 17, 2006, the EPA revoked the annual PM_{10} standard
3 - 3 year average of annual mean within an area must not exceed 15 μg/m^3
4 - 3 year average of 98th percentile of 24-hour concentrations at each monitor within an area must not exceed 35 μg/m^3
5 - 3 year average of the 4th highest daily maximum 8-hour average ozone concentrations, measured at each monitor within an area over each year, must not exceed 0.08 ppm.
6 – As of June 15, 2005 EPA revoked the 1-hour ozone standard in all areas except the fourteen 8-hour ozone non-attainment Early Action Compact (EAC) Areas.

Source; USEPA (40CFR Part 50)

Significant Impact Thresholds

CO - *De Minimus* Criteria

With respect to CO, in addition to the Federal and State standards, New York City has developed *de minimus* criteria to assess the significance of project-related impacts on local air quality. These criteria set the minimum change in an 8-hour average carbon monoxide concentration that would constitute a significant environmental impact. The criteria are defined as follows:

- An increase of 0.5 parts per million (ppm) or greater in the maximum eight hour concentration if the projected future ambient baseline concentration is equal to 8 ppm or between 8 ppm and 9 ppm.

- An increase of more than half the difference between the baseline concentrations and the 8-hour standards when no action concentrations are below 8 ppm.

Project-related impacts less than these values are not considered to be significant.

PM2.5 Incremental Impact Criteria

For $PM_{2.5}$, the NYSDEC and the NYCDEP have developed interim criteria guidance for the study and assessment of project-related impacts on local air quality. These threshold criteria are related to analyses that determine potential microscale and neighborhood scale incremental impacts (the difference between future build and future no-build) at sensitive receptor locations. The criteria are as follows:

For maximum 24-hour impact:

- 24-hour average PM2.5 concentration increments that are predicted to be greater 2 ug/m3 but no greater than 5 ug/m3 would be considered a significant adverse impact on air quality based on the frequency, duration and location of the predicted concentrations.

For Annual Impact:

- The maximum annual impact criteria of 0.3 ug/m3 is applicable to stationary sources and construction only.

- The criteria threshold concentration for neighborhood scale impacts on a yearly basis is 0.1 $\mu g/m^3$ (for stationary sources, receptor locations are based on a 1km x 1km grid centered at the maximum predicted microscale annual concentration, averaged over all receptors. For mobile sources, receptors are located at a distance of 15 meters from the edge of roadway.

Non-Criteria Air Toxics Pollutant Thresholds

In order to evaluate short-term and annual impacts of non-carcinogenic toxic air pollutants, the NYSDEC has established short-term guideline concentrations (SGCs) and annual guideline concentrations (AGCs) for exposure limits. These are maximum allowable one-hour and annual guideline concentrations, respectively, that are considered acceptable concentrations below which there should be no adverse effects on the health of the general public.

When cumulative impacts of multiple air toxics from multiple sources could pose a potential health risk to proposed development, a cumulative impact analysis for industrial sources would be performed. Potential cumulative impacts are determined based on the USEPA's Hazard Index Approach for non-carcinogenic compounds and using the USEPA's Unit Risk Factors for carcinogenic compounds. These methods are based on equations that use USEPA health risk information (established for individual compounds with known health effects) to determine the level of health risk posed by an expected ambient concentration of that compound at a potentially sensitive receptor. The derived values of health risk are additive and can be used to determine the total risk posed by multiple air contaminants. For carcinogens, the public health risk would be based on calculations of the incremental risk associated with each toxic pollutant. These incremental values would then be summed to arrive at the total risk. If the total risk is predicted to be less than or equal to one in one million (1×10^{-6}), the carcinogenic risk is considered negligible. For non-carcinogens, the public health risk would be based on estimates for inhalation of non-carcinogenic pollutants (i.e. the Hazard Index). Once the hazard index of each compound is established, they are summed together. If the total hazard index is less than or equal to 1.0, then the non-carcinogenic risk is considered negligible.

The following equations are used to calculate incremental risk for carcinogenic pollutants and the hazard index for non-carcinogenic pollutants:

- Incremental Risk = C x URF

  Where:
  C = annual average ambient air concentration of the compound in µg/m3
  URF = compound-specific inhalation unit risk factor in (µg/m3)-1

- Hazard Index = C / RfC

  Where:
  C = annual average ambient air concentration of compound in µg/m3
  RfC = compound-specific inhalation reference concentration in µg/m3

3.17.2 EXISTING POLLUTANT LEVELS AND REGULATORY SETTING

Monitored Data

Representative monitored ambient air quality data for the area are shown in Table 3.17-2. These data were compiled by the NYSDEC for 2006, the latest calendar years for which data are currently available. Monitored levels for pollutants that are considered for this analysis (i.e., SO_2, NO_2, and PM_{10}) do not exceed National and State ambient air quality standards. Monitored values indicate that current $PM_{2.5}$ annual levels exceed the NAAQS.

Table 3.17-2: Representative Ambient Air Quality Data

Pollutant	*Monitor*	*Averaging Time*	*Value*	*NAAQS*
CO	Brooklyn Transit (Traffic Site Monitor)	8-hour	5.9 ppm	9 ppm
	PS 59	8-hour	2.3 ppm	9 ppm
		1-hour	1.9 ppm	35 ppm
NO_2	PS 59	Annual	.034 ppm	0.053 ppm
O_2	IS 52 (Bronx)	8-hour	0.072 ppm	0.08 ppm
PM_{10}	PS 59 (R&P)	Annual (revoked)	23.0 µg/m3	50 µg/m3
		24-hour	67.0 µg/m3	150 µg/m3
$PM_{2.5}$	JHS 45	Annual	12.8 µg/m3	15 µg/m3
		24-hour	44.0 µg/m3*	35 µg/m3
SO_2	IS 52 (Bronx)	3-hour	.069 ppm	0.50 ppm (1300)
		24-hour	.036 ppm	0.14 ppm (365)
		Annual	.012 ppm	0.03 ppm (80)

Note: Values are the highest pollutant levels recorded during the latest available calendar years.

- *Denotes an exceedance of the NAAQS standard*
- *ppm – parts per million*
- *µg/m – microgram per cubic meter*

Source: NYSDEC 2006 Data.

Regulatory Setting

Attainment Status / State Implementation Plan (SIP)

The Clean Air Act (CAA), as amended in 1990, defines non-attainment areas as geographic regions that have not meet one or more of the NAAQS. When an area within a state is designated as non-attainment by the USEPA, the state is required to develop and implement a State Implementation Plan (SIP), which would describes how it will meet the NAAQS under deadlines established by the CAA. New York City has been designated as non-attainment area for ozone and $PM_{2.5}$ but as an attainment area for CO. Violations of the CO standard have not been recorded at NYSDEC monitoring sites for several years. As part of its ongoing effort to maintain its attainment designation for CO, New York State has committed to the implementation of area-wide and site-specific control measures to continue to reduce CO levels.

On February 13, 2004, New York State formally recommended that USEPA designate New York City (NYC) as non-attainment for $PM_{2.5}$; USEPA made their final non-attainment designation for $PM_{2.5}$ on December 17, 2004. On September 8, 2005, the USEPA proposed specific requirements that state and local governments have to meet as they implement the national ambient air quality standards for $PM_{2.5}$. State and local governments have three years from the date of the USEPA designation to develop implementation plans to meet the NAAQS. State plans are due in April 2008. $PM_{2.5}$ attainment designations would be effective by April 2010; $PM_{2.5}$ SIPs would be due by April 2013, and would be designed to meet the $PM_{2.5}$ standards by April 2015. On September 21, 2006 the USEPA tightened the 24-hour fine particle standard from 65 micrograms per cubic meter (µg/m3) to 35 µg/m3, but retained the current annual fine particle standard at 15 µg/m3. In addition, effective September 17, 2006 the USEPA revoked the current annual PM_{10} standard based on a lack of evidence that links health problems to long-term exposure to coarse particle pollution.

Ozone SIP revisions have been submitted to the USEPA over the past several years. A November 1992 NYSDEC submission to USEPA provided SIP revisions which addressed the minimum air quality control requirements that were established by the CAA. In November 1993, a revision was submitted which documented how a 15% reduction in ozone precursors would be achieved by the end of 1996. Subsequent SIP revisions took into consideration the need to incorporate alternative procedures in order to reach an ozone attainment status by 2007. Phase I of this plan calls for a 9% rate of progress for the period 1997 through 1999. Phase II calls for future per annum rates of progress for the years 2002, 2005 and 2007 to be at 3%. On April 15, 2004 USEPA officially designated the five NYC counties as moderate non-attainment for the new 8-hour ozone standard (effective June 15, 2004). USEPA revoked the 1-hour standard on June 15, 2005, so that New York State can focus attention an attaining the stricter 8-hour standard. However, the very specific control measures for the 1-hour standard included in the SIP will be required to stay in place until the 8-hour standard is attained. A new SIP for ozone was to be adopted by the state no later than June 15, 2007, with a target attainment deadline of June 15, 2010. However, on June 20, 2007, USEPA proposed to strengthen the national ambient air quality standards for ground-level ozone. The proposed revisions reflect new scientific evidence about ozone and its effects on people and public welfare. The USEPA will issue final standards by March 12, 2008. Based on that date, USEPA estimates the following implementation schedule:

- By June 2009: States make recommendations for areas to be designated attainment and nonattainment.

- By June 2010: USEPA makes final designations of attainment and nonattainment areas. Those designations would become effective 60 days after publication in the Federal Register.
- 2013: State Implementation Plans, outlining how states will reduce pollution to meet the standards, are due to USEPA (three years after designations).
- 2013 to 2030: States are required to meet the standard, with deadlines depending on the severity of the problem.

3.17.3 MOBILE SOURCE ANALYSIS

Carbon Monoxide Methodology

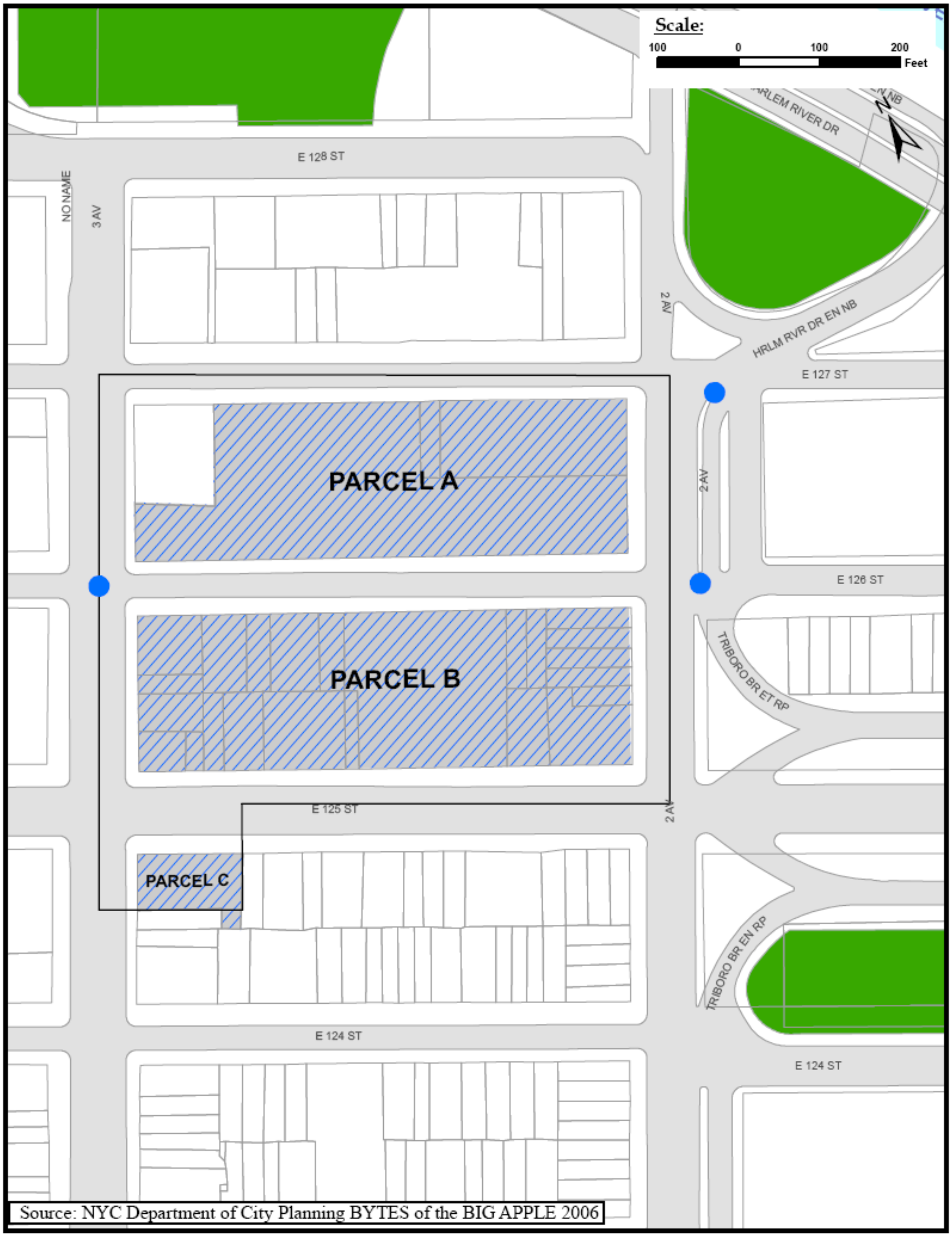
Selection of Intersection Analysis Sites

A microscale modeling analysis was conducted to estimate CO levels at the most heavily congested intersections (i.e., analysis sites) in the study area. These intersections are also anticipated to be those which would be most affected by the Proposed Action. The following scenarios were analyzed: existing conditions and future conditions (2012), with and without the proposed action. Screening procedures described in the *CEQR Technical Manual* were utilized in order to select the three worst-case analysis sites. Data related to traffic volumes, levels of service and vehicular speeds at the major signalized intersections are typically evaluated with and without the proposed action. However, (as per NYC DEP guidance) as the major concern for CO impacts is from the *de minimus* incremental criteria, for the proposed project, the selection of detailed analysis sites was based primarily on the use of project-generated trips . Intersections selected for analysis are shown in Table 3.17-3 and on Figure 3.17-1.

Table 3.17-3: Microscale Intersection Analysis Sites

Site Number	*Intersection*
1	126tH Street & Second Avenue
2	126th Street & Third Avenue
3	127th Street & Second Avenue

Receptors - The precise locations at which pollutant concentrations are estimated at each intersection are known as “receptors.” Following guidelines established by the USEPA, receptors are typically located where the maximum concentration is likely to occur and where the general public is likely to have access. For this analysis, receptors locations were distributed along sidewalks near the analysis intersection, and other nearby sensitive uses.



Source: NYC Department of City Planning BYTES of the BIG APPLE 2006

Legend
- Air Quality Intersections
- Project Site
- Rezoning Area

Figure 3.17-1 - Air Quality Intersection

East 125th Street Development EIS
NYC Economic Development Corporation

Traffic Data - Traffic data used as inputs for the air quality analysis were derived from vehicle counts and other information developed as part of the traffic study (see Chapter 3.16). Traffic periods considered in the air quality analysis were the same periods selected for the traffic analysis. They consisted of the AM, MD and PM weekday peak as well as the PM weekend peak. These are the periods when the maximum changes in pollutant concentrations are expected based on overall traffic volumes and anticipated changes in traffic patterns due to the proposed action.

The *2000 Highway Capacity Manual* and HCS 2000 software were used to develop the traffic data necessary for the air quality analysis. The vehicle classification (see below) was determined through field data collection. Existing vehicle speeds were obtained from field measurements for the area, and adjusted to estimate future free flow speeds.

Vehicle Classification Data -Vehicle classification percentages required to determine composite emission factors were based on traffic survey data for the following categories: light duty gasoline vehicles (LDGVs), sport utility vehicles (SUVs), medallion taxis, light-duty trucks, heavy-duty trucks, and buses. Where appropriate, the six collected vehicle classification categories were expanded into eight categories. The eight expanded categories were based on NYSDEC's downstate registration data contained in the MOBILE6 CO emissions model for each appropriate analysis year. Light duty gasoline trucks were divided into two sub-groups (LDGT12, and LDGT34). Heavy-duty trucks were divided into heavy duty gas vehicles (HDGVs) and heavy-duty diesel vehicles (HDDVs). All buses were analyzed as heavy-duty diesel vehicles (HDDVs).

Vehicular Emissions - CO emission factors were estimated using the USEPA MOBILE6 mobile emission factor algorithm model released by the USEPA on January 29, 2002. This version includes the effects of the new vehicle standards, and covers vehicle turnover. MOBILE6.2 (the most recent version), which includes emission factors for particulate matter, was released in the year 2004 and is used in this analysis.

The following assumptions were applied in using MOBILE6.2:

- NYSDEC input files with engine operating start and distribution parameters and vehicle miles traveled (VMT) for New York County were used to estimate baseline conditions;
- 2007 New York State registration and diesel sales fraction data;
- All project-generated trips were divided into in (hot start) and out (cold start) trips.
- SUVs were assumed to be LDGTs that have the same engine operating parameters as automobiles;
- A 24-hour average temperature distribution was used.

Dispersion Analysis

Mobile source dispersion models are the basic analytical tools used to estimate pollutant concentrations from the emissions generated by motor vehicles as expected under given conditions of traffic, roadway geometry, and meteorology. CAL3QHC Version 2 is a line-source dispersion model that predicts pollutant concentrations near congested intersection and heavily traveled roadways. CAL3QHC input variables include free flow and calculated idle emission factors, roadway geometries, traffic volumes, site characteristics, background pollutant concentrations, signal timing, and meteorological conditions. CAL3QHC predicts inert pollutant concentrations, averaged over a one-hour period near roadways. This model was used to predict concentrations at affected study-area intersections.

CAL3QHC predicts peak one-hour pollutant concentrations using assumed meteorology and peak-period traffic conditions. Different emission rates occur when vehicles are stopped (idling), accelerating, decelerating, and moving at different average speeds. CAL3QHC simplifies these different emission rates into the following two components:

- Emissions when vehicles are stopped (idling) during the red phase of a signalized intersection.
- Emissions when vehicles are in motion during the green phase of a signalized intersection.

The analyses followed USEPA's Intersection Modeling Guidelines (EPA-454/R-92-005) for CO modeling methodology and receptor placement. All major roadway segments (links) within approximately 1,000 feet from each analysis site (i.e., congested intersection) were considered. A mixing height of 1,000 meters and a surface roughness factor of 321 centimeters were included in all calculations.

A conservative analysis, which assumes that peak period vehicular emissions, traffic volumes, and intersection operating parameters occur every hour of each analysis year, was conducted. The use of peak hour baseline and project-generated traffic conditions would also result in conservative predictions of pollutant levels and project impacts.

To determine motor vehicle generated PM concentrations adjacent to streets near the proposed action area, the CAL3QHCR model was also applied. This version of the model can utilize hourly traffic and meteorology data, and is therefore more appropriate for calculating 24-hour concentrations.

Background Values

To properly represent the total impact of the proposed action in the analysis, it is necessary to consider representative background levels for each of the analyzed pollutants. The background level is the component of the total concentration not accounted for through the microscale modeling analysis. Applicable background concentrations were added to the modeling results to obtain total pollutant concentrations at each receptor site for each analysis year. Background concentrations were based either on monitored values collected by the NYSDEC or values obtained from NYCDEP. The CO background values were provided by NYCDEP using the latest NYSDEC procedures based on the most recent ambient monitoring data and future decreases in vehicular emissions. $PM_{2.5}$, NO_2 and SO_2 background values were also obtained from NYCDEP. These values were added to the modeling results as appropriate to obtain total pollutant concentrations at each receptor site for each analysis year. The background values used in the air quality analyses are provided in Table 3.17-4.

Table 3.17-4: Background Concentrations

Pollutant	*Averaging Time*	*Value*
CO	8-hour	2.0 ppm
NO2	Annual	60 µg/m3
PM_{10}	24-hour	91 µg/m3
SO2	3-hour	233 µg/m3
	24-hour	136 µg/m3
	Annual	34 µg/m3

Source: NYCDEP

3.17.3.1 Mobile Source CO Results

Existing Conditions

The results of the mobile source air quality modeling analysis under existing (2007) conditions are provided in Table 3.17-5. The values shown are the maximum CO concentrations estimated near each analysis site under the time frames that correspond to the NAAQS.

Table 3.17-5: Existing Conditions – Maximum 8-Hour CO Levels (2007)

Site #	*Analysis Site*	*8-hr CO Level (ppm)*	*Maximum Time Period*
1	126th Street & Second Avenue	4.9	AM
2	126th Street & Third Avenue	4.7	AM
3	127th Street & Second Avenue	4.0	AM

Notes: 1. Maximum results of all time periods analyzed.
2. All values include appropriate background concentration.
3. 8-hour CO background concentration = 2.0 ppm

The results are summarized as follows:

- Carbon monoxide levels do not exceed the 8-hour CO standard of 9 ppm. The highest estimated concentration (4.9 ppm) occurs near the intersection of East 126th street and Second Avenue (Analysis Site #1) under the AM peak period.

Future Without the Proposed Action

A summary of the results of the mobile source air quality modeling analysis for the future without the proposed action in 2012 are provided in Table 3.17-6. The values shown are the maximum CO concentrations estimated near each analysis site under the time frames that correspond to the NAAQS.

Table 3.17-6:_ Future Without the Proposed Action – Maximum 8-Hour CO Levels (2012)

Site #	*Analysis Site*	*8-hr CO Level (ppm)*	*Maximum Time Period*
1	126tH Street & Second Avenue	4.5	AM
2	126th Street & Third Avenue	4.3	AM
3	127th Street & Second Avenue	3.7	AM

Notes: 1. Maximum results of all time periods analyzed.
2. All values include appropriate background concentration.
3. 8-hour CO background concentration = 2.0 ppm

The results are summarized as follows:

- CO levels would not exceed the 8-hour standard at any of the analysis sites. The highest estimated concentration (4.5ppm) would occur near the intersection of East 126th Street and Second Avenue (Analysis Site #1) under the PM peak period.

  These results incorporate the assumption that the future year CO emission rates would be affected by decreases in future year emission factors due to increasing stringent emission control requirements and increases in traffic volumes due to anticipated increases in travel demand.

Future With the Proposed Action

A summary of the results of the mobile source air quality modeling analysis for the Future with the Proposed Action in 2012 is provided in Table 3.17-7. The values shown are the maximum CO concentrations increments estimated near each analysis site with the proposed action.

Table 3.17-7: 2012 Future With the Proposed Action – Maximum 8-Hour CO Levels

Site #	*Analysis Site*	*8-hr CO Level (ppm)*	*Maximum Time Period*
1	126^{tH} Street & Second Avenue	4.7	AM
2	126th Street & Third Avenue	4.4	AM
3	127th Street & Second Avenue	3.7	AM

Notes: 1. Maximum results of all time periods analyzed.
2. All values include appropriate background concentration.
3. 8-hour CO background concentration = 2.0 ppm

The results of this analysis are summarized as follows:

- CO levels would not exceed the 8-hour standard at any of the analysis sites. The highest estimated 8-hour concentration (4.7 ppm) would occur near the intersection of East 126th Street and Second Avenue (Analysis Site #1) under the PM peak period.

  The highest project-generated CO increment would occur at the intersection of East 126th Street and Second Avenue during the AM peak period (increase of 0.2 ppm). The NYCDEP CO *de minimus* values would not be exceeded at this site or any other analysis site, indicating that the proposed action does not have the potential to cause CO impacts that are considered to be significant.

Particulate Matter Methodology

PM_{10} – Detailed Mobile Source Air Quality Intersection Analysis

The same methodology used for the prediction of CO concentrations was used in the prediction of PM_{10} concentrations. This pertains to receptor locations as well as vehicle classification and traffic data. Emissions of PM_{10} were also predicted using the USEPA MOBILE6 mobile emission factor algorithm model. However, only one intersection was chosen for detailed analysis (126th Street and Second Avenue). In addition, with respect to the model used to predict pollutant concentrations of PM_{10}, the CAL3QHCR was applied. This version of the model can utilize hourly traffic and meteorology data, and is therefore more appropriate for calculating 24-hour concentrations. The location, at 126th Street and Second Avenue, represents the intersection that would be most affected by project induced heavy vehicles. This location was selected as emissions of PM_{10} at this intersection could impact air quality at nearby sensitive receptors.

3.17.3.2 Mobile Source PM_{10} Results

Future Without the Proposed Action

A summary of the results of the mobile source air quality modeling analysis for the future without the proposed action in 2012 are provided in Table 3.17-8. The values shown are the maximum PM_{10} concentrations estimated near each analysis site under the time frames that correspond to the NAAQS.

Table 3.17-8: Future Without the Proposed Action
Maximum 8-Hour PM_{10} Levels (2012)

Analysis Site	*24-hrPM10 Level (ug/m3)*	*Maximum Time Period*
126th Street and Second Avenue	116.3	AM

Notes: 1. Maximum results of all time periods analyzed.
2. All values include appropriate background concentration.
3. 24-hour PM10 background concentration = 91 ug/m3

PM_{10} levels would not exceed the 24-hour standard at selected analysis site. The highest estimated 24-hour concentration (116.3 ppm) would occur under the AM peak period.

Future With the Proposed Action

A summary of the results of the mobile source air quality modeling analysis for the Future with the Proposed Action in 2012 is provided in Table 3.17-9. The values shown are the maximum CO concentrations increments estimated near each analysis site with the proposed action.

Table 3.17-9: Future With the Proposed Action
Maximum 24 Hour PM_{10} Levels (2012)

Analysis Site	*24-hrPM10 Level (ug/m3)*	*Maximum Time Period*
126th Street and Second Avenue	116.6	AM

Notes: 1. Maximum results of all time periods analyzed.
2. All values include appropriate background concentration.
3. 24-hour PM10 background concentration = 91 ug/m3

The results of this analysis indicate that there would be no impacts to nearby sensitive receptors from project related mobile source emissions of PM_{10}.

3.17.3.2 Mobile Source $PM_{2.5}$ Screening

$PM_{2.5}$ - Mobile Source Air Quality Screen

In concert with its interim guidelines for $PM_{2.5}$, NYCDEP has developed a mobile source screening procedure in which the minimum allowable number of project-induced Heavy Duty Diesel (HDD) vehicle trips per hour that would not result in significant emissions of $PM_{2.5}$ is predicted. Based on the future traffic distribution related to project induced trucks, buses and autos, one location was identified that could potentially surpass the predicted NYC DEP screening threshold of 39 HDD Vehicle's. The location, at 126th Street and Second Avenue, represents the intersection that would be most affected by project induced heavy vehicles. Emissions of $PM_{2.5}$ at this intersection could impact air quality at nearby sensitive receptors.

Traffic data indicated that the proposed development would induce a maximum of 20 MTA diesel buses at this intersection. Project traffic data also indicated the proposed development would induce a smaller number (less than 12) of heavy duty vehicles. While only a percentage of these heavy duty vehicles (based on MOBILE6.2 – registration data for the 2012 Build year) would actually be HDD vehicles, The analysis conservatively assumed that all would be HDDV's. An additional contribution of $PM_{2.5}$ would also result from automobile exhaust. To account for this, the NYCDEP has developed a procedure in which an equivalent number of auto vehicles is calculated for one HDD vehicle. For the proposed project, the procedure involves using the ratio of 2012 MOBILE6.2 Light Duty Gas Vehicle's (LDGV) emissions to 2012 MOBILE6.2 HDD vehicle emissions. For the proposed development, the resulting emissions ratio was calculated to be approximately 11 to 1 (i.e., it would take approximately 11 autos to equal the $PM_{2.5}$ emissions equivalent of 1 HDD vehicle). Since the maximum number of induced autos at the intersection would be 419, the equivalent number of HDD vehicle would be 39.

When this result is combined with the actual number of induced HDD vehicles (i.e., 20 buses and 12 trucks), the total number of equivalent HDD vehicles would be 71, and thus would surpass the 39 HDD vehicle screening limit calculated for $PM_{2.5}$. As a result, a detailed mobile source analysis of $PM_{2.5}$ emissions for both $PM_{2.5}$ and PM_{10} was conducted at the intersection of 126th Street and Second Avenue.

$PM_{2.5}$ – Detailed Mobile Source Air Quality Intersection Analysis

An analysis was conducted to analyze potential $PM_{2.5}$ air quality impacts resulting from the implementation of the proposed development. Per the NYC DEP $PM_{2.5}$ interim guidance, mobile source microscale analyses were conducted for the 24-hour averaging period. A neighborhood scale analysis was also conducted for the annual averaging period. Specific methodology and background information are discussed below.

Dispersion Model – The EPA's CAL3QHCR dispersion model was used to predict 24-hour and annual concentrations of mobile source $PM_{2.5}$. CAL3QHCR, which is a refinement to CAL3QHC, allows for the incorporation of hourly meteorological data into the model as oppose to using worst case assumptions regarding meteorological conditions. Accordingly, five years worth of meteorological data for which includes hourly wind speeds, directions and atmospheric stability was used.

Intersection Selection - A microscale or local analysis was conducted for mobile sources at only one analysis location. The location was selected because in the future build condition, it was the only location that demonstrated that it would have to accommodate more than the calculated NYC DEP's screening threshold criteria of 39 project-generated HDDV's per hour. The analysis site is located at the intersection of 126th street and 2nd Avenue.

Receptors - Following the $PM_{2.5}$ interim guidelines established by the NYC DEP, receptors were located where the maximum projected incremental concentrations were likely to occur and where the general public is likely to have access such as sidewalks.

Meteorological Conditions – For the most recent five year period (2001 to 2006) available, representative hourly meteorological data from La Guardia Airport with upper air data from Brookhaven were used in the analysis.

Traffic Data - Traffic data were derived from traffic counts and other information developed as part of the study's traffic analysis, using methodologies acceptable to the New York City Department of Transportation (NYCDOT). Project-induced auto, truck and bus trips were provided for peak period traffic conditions. However, the peak periods for each vehicle type did not coincide. For autos, the peak PM traffic period was used and for trucks the peak AM traffic period was used. For buses, a late night (8-9PM) peak traffic condition based on bus accumulation data for the surrounding bus garages was used. All volumes were representative of induced trips for the 2012 build year. The peak periods were selected because they produced the maximum anticipated project-generated traffic and therefore would have the greatest potential for significant air quality impacts.

Vehicular Emissions - $PM_{2.5}$ exhaust emission factors were estimated using EPA's recommended MOBILE 6.2 emission model. Exhaust, brake, and tire wear emissions from moving vehicles along with vehicular idle emissions were estimated for HDD trucks, buses and autos for the project Build year 2012. Emissions of fugitive dust were estimated using EPA's latest - Air Pollutant Emission Factor (AP-42) equation for paved roads. The equation incorporates empirical data for fugitive dust and has recently been adjusted by the EPA to discount the contribution from exhaust and brake and tire wear emissions already accounted for in Mobile 6.2. Emissions from fugitive dust are dependent upon vehicle weight and the surface silt loading. In accordance with the latest NYCDEP guidelines:

- a silt loading factor of 0.1 for collector roadways with more than 5,000 vehicles per day was used.
- An average vehicle fleet weight of 6000 lbs was calculated for project-induced vehicles.

Vehicle Classification Data – Mobile 6.2 HDDV (Heavy Duty Diesel vehicles), Light Duty Gas Vehicles (LDGV) and city bus vehicle class were used in the prediction of emissions.

3.17.3.3 Mobile Source $PM_{2.5}$ Results

For the $PM_{2.5}$ incremental impact analysis, maximum impacts were calculated for nearby sensitive uses for comparison with the NYCDEP interim guidance. The predicted 24-hour and annual maximum neighborhood mobile source concentrations from project vehicles are presented in Table 3.17-10

Table 3.17-10

Predicted $PM_{2.5}$ Concentrations at 126th Street and 2nd Avenue

Pollutant	Maximum Total Predicted Incremental Concentration ($\mu g/m^3$)	Interim Guidance Criteria ($\mu g/m^3$)
$PM_{2.5}$ 24-Hour Microscale	0.76	See Below*
$PM_{2.5}$ Annual Neighborhood Scale	0.04	0.3

** EPA has lowered the NAAQS to 35 µg/m3, effective December 18, 2006. As a result, the PM2.5 24-hour average – interim guidance criteria is presented as a range(more than or equal to 2 µg/m³ with a not to exceed value of 5 µg/m³).This range is based on frequency, duration and location of the predicted concentrations.*

Based on the above, $PM_{2.5}$ incremental concentrations from mobile sources related to the operation of the proposed development were predicted to be below the interim guidance criteria. Therefore, significant adverse impacts to nearby sensitive receptors from project related mobile source emissions of $PM_{2.5}$ are not expected.

Parking Facilities Analysis

<u>Auto Parking</u>

Pollutant concentrations could be affected near the two new underground parking facilities that would be built as part of the proposed development. To estimate the potential impacts from the emissions of these facilities, a detailed analysis was performed. One of the parking facilities would be a 200 space parking garage located underneath Parcel A; the other would be a 400 space car parking garage located underneath Parcel B.

Because the proposed garages would be used almost exclusively by gasoline-powered automobiles and not diesel-fueled trucks, CO was the only pollutant considered for this analysis. PM_{10} and $PM_{2.5}$ concentrations would not be materially affected by emissions from these facilities.

CO concentrations near the two facilities were estimated following the *CEQR Technical Manual* guidelines for mechanically ventilated, enclosed garages. Pollutant concentrations were estimated at receptors (representative of a near and far sidewalk locations) located at 5 and 90 feet from the exhaust vents for each garage. The height of the vent was assumed to be a minimum of 10 feet above street level. An additional elevated receptor located above the vent on the near side of the street was studied to determine potential impacts on future residents at the proposed development site. The study assumed that the garages would use only one exhaust vent located along Third Avenue for both the Parcel A and Parcel B garages. These are conservative assumptions since 1) more than 1 vent would dilute pollutant emissions at a specific location, 2) the Third Avenue side would experience more traffic volume than 126th Street, and 3) contributions from emissions generated by Third Avenue traffic under peak hour Build conditions could be added to these estimated concentrations to estimate the cumulative impacts of the garages and their corresponding street contributions.

This analysis was conducted for the 2012 analysis year, for the weekday PM peak period. According to the traffic auto accumulation data, garage emissions during the weekday PM peak period would be greatest because it is conservatively assumed that all of the exiting vehicles would initially idle then leave in the higher-polluting, cold-start mode. As a result the PM peak period was used for the analysis.

The resulting maximum total 8-hour CO concentration (i.e., including background levels and street traffic contributions) predicted for any of the receptor sites were not estimated to cause or exacerbate the NAAQS of 9.0 ppm.

<u>Proposed MTA Underground Bus Parking Garage</u>

In addition to the proposed automobile garages, Parcel A of the proposed development under the proposed action would include an underground bus parking facility for the storage of MTA buses. As the majority of the MTA fleet presently uses diesel fuel, an analysis was conducted to determine whether bus activities (including entering, existing and idling) within the facility would result in any air quality impacts at nearby sensitive receptors.

It was assumed that the diesel exhaust from buses in the garage would be self contained within the parking facility as the garage roof would be made from concrete, which would represent an impermeable barrier to the exhaust fumes. Exhaust would be mechanically vented to the roof of the development site and would be located on the southern end of Parcel A's east tower to limit the exposure of the public to pollutant emissions. Traffic bus accumulation data indicate that the maximum number of vehicles entering and exiting would occur during the 6-7AM traffic hour.

Although this traffic period is not one of the peak traffic periods studied, it was conservatively used in the analysis.

Detailed plans regarding the venting of exhaust emissions do not yet exist. Therefore, based on the mechanical requirements of similar MTA facilities and typical parameters used by mechanical engineers for parking garages, the analysis assumed the following:

- The total area of the garage would be 100,000 square feet.
- The height of the underground garage would be 20 feet
- All buses would use diesel fuel
- Required air movement would be 200,000 cubic feet per minute(cfm) (based on 6 air exchanges per hour)
- Air speed exiting the rooftop vent would be 1000 feet per minute (fpm)
- Exhaust would be vented through one vent shaft.
- Required area of the rooftop vent would be 200 square feet.
- Vented air temperature would be assumed to be room temperature (291 Kelvin).
- An ASHRAE designated - Minimum Efficiency Report Value (MERV) 12 particulate air filter with an efficiency of 80% for $PM_{2.5}$ would be used to limit emissions from the vent.

Once a project developer is selected, the final venting parameters will be determined and may differ from those described above (in particular, final plans may incorporate several venting shafts instead of one, resulting in numerous rooftop vent locations). However, the assumptions provided herein facilitate a conservative estimate of pollutant emissions.

Since the bus garage is part of the proposed development and would emit pollutants from roof top vents, concentrations of $PM_{2.5}$ and PM_{10} were estimated cumulatively as part of the stationary source analysis conducted for the HVAC systems of the proposed development. Therefore, results of the analysis are shown below under the heading “Analysis for Project-Generated Heating Systems Emissions”.

3.17.4 ANALYSIS OF PROJECT-GENERATED HEATING SYSTEM EMISSIONS

Introduction

The primary issues with regard to fuel combustion sources associated with HVAC systems include; 1) the impact of HVAC systems from the proposed development on existing and future buildings in addition to other sensitive receptor locations within the project area; and, 2) the impact of existing large-scale commercial, institutional, or residential developments on the development site.

With regard to the impact of HVAC systems from the proposed development on existing and future buildings, the proposed development would be a very large complex that would include ten building towers. For the purposes of assessing air quality impacts, it is assumed that each tower would include one stack for HVAC emissions. As a result, stationary source screening procedures described in the *CEQR Technical Manual* would not be appropriate. In addition, while the existing building stock adjacent to the development would be shorter than the proposed development towers, other planned developments along the south side of 125th Street between Second and First Avenues may be as tall, if not taller. Parking for MTA buses would also be included as part of the proposed development. The proposed action would locate the MTA bus garage underground on Parcel A of the development site. Pollutant emissions from bus exhaust would be mechanically vented to the rooftop, on the south side of the east tower. Therefore, due to the geometric complexities of the proposed development and the various pollutant sources involved, a detailed stationary source analysis of project development related emissions was conducted using the USEPA's AERMOD model. The analysis is presented below.

With regard to potential impacts of existing large-scale developments on the proposed project, a field examination determined that two large apartment complexes are located to the south of the proposed development. Consequently, an evaluation of the potential impacts that these sources could have on the proposed development site is also presented below.

Methodology

Emissions from the heating (and hot water) systems of the proposed development may affect air quality levels at other nearby buildings. Potential impacts would be a function of fuel type, stack height, size of development, and location of the emission sources relative to the nearby buildings. Fuel uses may include oil or natural gas for space heating and hot water, and natural gas for cooking. For the purposes of this analysis, the fuel type that would supply heat and hot water to the new development is conservatively assumed to be No. 2 fuel oil. As part of the HVAC analysis, vehicle exhaust emissions from the proposed bus garage is included. Therefore, final results will include emission from all project-related stationary sources. Pollutants of concern include SO_2, PM_{10} and $PM_{2.5}$.

<u>Analysis Parameters</u>

Detailed dispersion modeling analyses using USEPA's AERMOD model were conducted for the proposed development site. AERMOD is a versatile model capable of predicting pollutant concentrations from continuous point, area, and volume sources. AERMOD uses enhanced plume and wake dispersion algorithms that are capable of estimating pollutant concentrations in a building's cavity and wake regions. The AERMOD model was used to estimate pollutant concentrations with and without downwash effects on plume dispersion.

Three pollutants emitted from project stack locations-- SO_2, PM_{10} and $PM_{2.5}$ -- were considered. Short-term (3hr & 24 hr) and long-term (i.e., annual average) concentrations were estimated.

Regarding HVAC emissions, the following dispersion modeling options and assumptions were applied:

- Emissions would be released through a single stack located at the center of each of the ten development towers; and
- A conservative set of default values (stack exhaust temperature of 293^{O}K, velocity of 0.001 m/s and a stack diameter of 0.0 m) were used, as recommended by the *CEQR Technical Manual.*

Emission Rates

Emission rates were estimated as follows:

- A fuel consumption rate for each proposed or projected residential / commercial building was estimated using fuel consumption tables supplied in the *CEQR Technical Manual*. These factors were then multiplied by the square footage of each building tower to estimate total gallons of fuel consumed annually. The square footage of each building tower was estimated based on parameters in the project concept plant.
- When available, daily values were divided by 24 to obtain hourly values for use in the short-term dispersion analysis, and
- Average annual pollutant emission rates were estimated, as recommended in *CEQR Technical Manual*, by dividing the total amount of pollution estimated to be emitted in a year by the number of hours in one year (8,760 hours).

Emission factors were obtained from USEPA's "Compilation of Air Pollutant Emission Factors" (AP-42), assuming fuel oil Nos. 2 with a sulfur content of 0.2 percent, would be used to heat the new development.

Coordinate System and Receptors

A GIS coordinate system was utilized that included the location of each stack on the roof of an affected building and nearby elevated receptors. Because highest impacts would occur along the level of the plume centerline at approximately the height of the stack, elevated receptors were placed at varying elevations. It was assumed that all nearby taller buildings would have operable windows at these levels and were therefore considered as potential sensitive receptor sites.

Meteorology

The latest five years of meteorological data from La Guardia Airport was used for the years 2000 through 2004.

Background Values

Background concentrations (i.e., pollutant levels from other sources in the study area) for the pollutants of concern were obtained from NYCDEP and based on the latest monitoring data collected by the NYSDEC. These values, which are provided in Table 3.17-4 above, were added to estimate project impacts, and the resulting total concentrations were compared with appropriate NAAQS for SO_2 and PM_{10} and the DEC/DEP interim incremental criteria for $PM_{2.5}$.

Stationary Source Analysis

Impacts from the Proposed Development on Sensitive Receptors

SO_2

With respect to the impact the proposed development would have on sensitive receptors, the results of the analysis indicated that when using No. 2 fuel oil, emissions from the proposed development would not result in any air quality impacts related to SO_2. The results are shown in Table 3.17-11.

Table 3.17-11: Air Quality Impacts - Summary of Maximum Predicted SO_2 Concentrations

Averaging Period	Background Concentration (µg/m3)	Maximum Predicted Concentration (µg/m3)	Maximum Predicted Total Concentration (µg/m3)	NAAQS (µg/m3)
3 Hour	233	319.3	552.3	1300
24 Hour	136	66.8	202.8	365
Annual	34	5.4	39.4	80

The result of this analysis is that the proposed development would cause no violations of the NAAQS, and would have no significant adverse environmental impacts on air quality.

PM_{10}

The results of the analysis indicated that when using No. 2 fuel oil for HVAC systems, emissions from the proposed action for the East 125th Street Development on Blocks 1789, 1790 and 1791 would not result in any air quality impacts related to PM_{10}. The results, which include contribution from the proposed underground bus garage, are shown in Table 3.17-12.

Table 3.17-12: Air Quality Impacts -
Summary of Maximum Predicted PM_{10} Concentrations

Averaging Period	Background Concentration (µg/m3)	Maximum Predicted Concentration (µg/m3)	Maximum Predicted Total Concentration (µg/m3)	NAAQS (µg/m3)
24 Hour	91	2.3	93.3	150

The result of this analysis show that the proposed development would cause no violations of the NAAQS, and would have no significant adverse environmental impacts on air quality.

$PM_{2.5}$

For the $PM_{2.5}$ incremental impact analysis, maximum impacts were calculated at nearby sensitive receptors for comparison with the NYC DEP interim guidance. The predicted results maximum receptor concentration from emission sources related to the proposed development are presented in Table 3.17-13 below. These results include the contribution from the proposed underground bus garage.

Table 3.17-13: Air Quality Impacts –
Summary of Maximum Predicted $PM_{2.5}$ Concentrations

Pollutant	Maximum Total Predicted Incremental Concentration (µg/m^3)	Interim Guidance Criteria (µg/m^3)
$PM_{2.5}$ 24-Hour	0.8	See Below*
$PM_{2.5}$ Annual (Discrete)	0.05	0.3
$PM_{2.5}$ Annual (Neighborhood)	0.001	0.1

** EPA has lowered the NAAQS to 35 µg/m3, effective December 18, 2006. As a result, the PM2.5 24 hour average – interim guidance criteria is presented as a range(more than or equal to 2 µg/m^3 with a not to exceed value of 5 µg/m^3). This range is based on frequency, duration and location of the predicted concentrations.*

The result of this analysis is that the model-predicted concentrations are below the interim guidance criteria levels. Therefore, the proposed development would not result in any significant adverse environmental impacts on air quality.

Potentially Significant Existing Emission Sources

Field examinations determined that two large scale residential developments -- the 35-story Taino Towers building complex, and the 16-story Wagner Houses building complex -- are located to the south of the proposed development. However, both sites are located beyond 400 feet of the proposed development. An additional field examination also confirmed that there were no large industrial emission sources (e.g., power plant, co-generation facility, etc.) located within 1,000 feet of the proposed development. As a result, impacts from significant emission sources on the proposed development are not anticipated.

Stationary Source Analysis of the Existing MTA Bus Maintenance Depot

Emissions from the existing MTA Bus Depot located at 126th Street and Second Avenue could potentially impact the proposed development project. Based on emissions data obtained from the New York City Transit Authority, a detailed analysis using USEPA's AERMOD was conducted to determine the potential impact that the Bus Depot could have on the proposed development. According to the MTA, pollutant emissions would result from bus exhaust within the Depot and space heating. No other emissions-related processes, including spray booths or other painting activities were identified as being present at these sites by the MTA. Natural gas is used for the space heating and the overwhelming majority of buses would be using diesel fuel. Consequently, a detailed analysis was conducted for PM_{10} (resulting from mechanically vented bus exhaust) and NO_2 (resulting from space heating) for the garage. MTA estimates of yearly pollutant emissions for NO_2 and PM_{10} would be 13,328 and 703 lbs, respectively. Default stack parameters from the *CEQR Technical Manual* were used in the analysis. The results of the modeling analysis (shown in Table 3.17-14) indicate that there would be no exceedances of the NAAQS for NO_2 or PM_{10} near any of the proposed development's sensitive receptor sites. Therefore, there would be no significant adverse impact from the pollutant emissions of the existing 126th Street MTA Bus Depot.

Table 3.17-14: Air Quality Impacts -
Summary of Maximum Predicted Concentrations

Pollutant	Averaging Period	Background Concentration (µg/m3)	Maximum Predicted Concentration (µg/m3)	Maximum Predicted Total Concentration (µg/m3)	NAAQS (µg/m3)
NO_2	Annual	60	1.2	61.2	100
PM_{10}	24 hour	91	1.7	92.7	150

3.17.5 ANALYSIS OF AIR TOXICS

Introduction

This section addresses potential impacts from existing toxic emission sources on the proposed development. These emissions are of concern because a large portion of the proposed development includes residential uses. As a result, emissions of toxic pollutants from the operation of any identified facilities may result in pollutant concentrations that could affect these residential uses.

The following procedures were used to estimate the potential air quality impacts of these toxic emissions:

- To ensure that the toxics analysis included existing sources with the most potential to affect the proposed action, an analysis zone within approximately 400 feet of the proposed development was selected as per the *CEQR Technical Manual*;

- Air permits for all facilities within the analysis zone were acquired from NYSDEC and NYCDEP. The USEPA Envirofacts Warehouse databases were also checked. A review of these permits, along with a separate field review of potential existing sites not included in any database, was conducted.

Permit Information

Information on emission data for the manufacturing and industrial facilities with air toxics within the study area were developed as follows:

- NYSDEC's Air Guide-1 (AG-1), which includes a database with information on all facilities in the state that have an air quality permit (as of 1996), was searched to identify facilities located within the area that had received state air quality permits.
- The NYC DEP Bureau of Environmental Compliance (BEC) files of current air quality permits for all facilities operating within the air toxics study area were examined.

Searches using NYSDEC's Air Guide-1 program did not identify any properties. An additional search using the USEPA Envirofacts Warehouse database did result in one property being identified, However, this property currently exists on the footprint of the proposed development and thus would not exits in the future. A search of the NYCDEP Bureau of Environmental Compliance (BEC) files identified two properties. One was the same property identified in the Envirofacts database while the other was a property that no longer existed.

Therefore, since searches of three databases did not identify any air toxics facilities, no further analysis of air toxics is required since air quality impacts from air toxics on the proposed development would not occur.

3.17.6 CONCLUSION

The Proposed Action (which includes an underground bus garage) would not cause or exacerbate any exceedances of air quality standards or impact criteria. Therefore, the proposed action would not result in significant adverse impacts related to stationary or mobile sources.