Chapter 12: Air Quality

A. INTRODUCTION

The potential for air quality impacts from operations of the Proposed Action is examined in this chapter. As described in Chapter 1, "Project Description," the Proposed Action consists of: 1) the adoption of zoning to establish a Medical Oriented District (MOD) in the area surrounding the existing New York Presbyterian Hospital (NYPH) facility (the "Proposed Zoning Action"); and 2) site plan approval for the MOD Development Plan proposed by Gyrodyne, LLC and VS Construction to develop a mix of medical, residential, and commercial uses within the proposed MOD (the "Proposed Project"). This chapter describes the existing conditions within the Study Area and assesses future conditions with and without the Proposed Action to identify potential impacts associated with emissions generated by stationary sources and with off-site emissions from on-road vehicle trips generated by each phase.

Air quality impacts can result from emissions generated by direct stationary sources, such as emissions from on-site fuel combustion for heat and hot water systems, or indirect sources, such as off-site emissions from on-road vehicle trips generated by the project or other changes to future traffic conditions due to the project. The Proposed Action would generate vehicle trips; therefore the potential for indirect mobile source impacts from the on-street vehicles generated by the Proposed Action, as well as mobile source impacts from the surface lot parking facilities on multiple parcels within the MOD, were evaluated. The MOD Development Plan would also include fossil fuel-fired heat and hot water systems. Therefore, stationary source impacts were evaluated as well.

PRINCIPAL CONCLUSIONS

As discussed below, the additional vehicle trips generated by the Proposed Action and the MOD Development Plan's stationary sources are not expected to cause any exceedance of ambient air quality standards. Therefore, there would be no potential significant adverse air quality impacts from the Proposed Action. With the Proposed Zoning Action, the NYPH facility as a nearby source is not expected to cause any significant adverse air quality impacts on sensitive receptor locations introduced by the Proposed Project, however, as this is a Generic Environmental Impact Statement (GEIS), as more information becomes available, additional detailed analysis could be required.

B. POLLUTANTS FOR EVALUATION

Ambient air quality is affected by air pollutants produced by both motor vehicles and stationary sources. Emissions from motor vehicles are referred to as mobile source emissions, while emissions from fixed facilities are referred to as stationary source emissions. Ambient concentrations of carbon monoxide (CO) are predominantly influenced by mobile source emissions. Particulate matter (PM), volatile organic compounds (VOCs), and nitrogen oxides (nitric oxide (NO) and nitrogen dioxide (NO_2), collectively referred to as NO_x) are emitted from both mobile and stationary sources. Fine PM is also formed when emissions of NO_x, sulfur oxides (SO_x), ammonia, organic compounds, and other gases react or condense in the atmosphere.

Emissions of sulfur dioxide (SO_2) are associated mainly with stationary sources, and some sources utilizing non-road diesel such as large international marine engines. On-road diesel vehicles currently contribute very little to SO_2 emissions since the sulfur content of on-road diesel fuel, which is federally regulated, is extremely low. Ozone is formed in the atmosphere by complex photochemical processes that include NO_x and VOCs. Ambient concentrations of CO, PM, NO_2, SO_2, ozone, and lead are regulated by the U.S. Environmental Protection Agency (EPA) under the Clean Air Act (CAA), and are referred to as 'criteria pollutants'; emissions of VOCs, NO_x, and other precursors to criteria pollutants are also regulated by EPA.

CARBON MONOXIDE

CO, a colorless and odorless gas, is produced in the urban environment primarily by the incomplete combustion of gasoline and other fossil fuels. In urban areas, approximately 80 to 90 percent of CO emissions are from motor vehicles. CO concentrations can diminish rapidly over relatively short distances; elevated concentrations are usually limited to locations near crowded intersections, heavily traveled and congested roadways, parking lots, and garages. Consequently, CO concentrations must be analyzed on a local (microscale) basis. Potential impacts on local CO concentrations from the Proposed Action were evaluated.

NITROGEN OXIDES, VOCS, AND OZONE

NO_x are of principal concern because of their role, together with VOCs, as precursors in the formation of ozone. Ozone is formed through a series of reactions that take place in the atmosphere in the presence of sunlight. Because the reactions are slow and occur as the pollutants are advected downwind, elevated ozone levels are often found many miles from sources of the precursor pollutants. The effects of NO_x and VOC emissions from all sources are therefore generally examined on a regional basis. The contribution of any action or project to regional emissions of these pollutants would include any added stationary or mobile source emissions.

The Proposed Action would not have a significant effect on the overall volume of vehicular travel in the region; therefore, no measurable impact on regional NO_x emissions or on ozone levels is predicted. An analysis of the emissions of these pollutants from mobile sources was therefore not warranted for the Proposed Action.

In addition to being a precursor to the formation of ozone, NO_2 (one component of NO_x) is also a regulated pollutant. Since NO_2 is mostly formed from the transformation of NO in the atmosphere, it has mostly been of concern further downwind from large stationary point sources, and not a local concern from mobile sources. (NO_x emissions from fuel combustion consist of approximately 90 percent NO and 10 percent NO_2 at the source.) However, with the promulgation of the 2010 1-hour average standard for NO_2, local sources such as vehicular emissions may become of greater concern for this pollutant in the future. The increases in NO_2 concentrations associated with the mobile sources have not been evaluated explicitly due to limitations in guidance and modeling tools. However, any increase in NO_2 associated with the mobile sources would be relatively small, as demonstrated below for CO and PM, due to the very small increases in the number of vehicles. This increase would not be expected to significantly affect levels of NO_2 experienced near roadways.

Potential impacts on local NO_2 concentrations from the MOD Development Plan's heat and hot water systems were evaluated.

LEAD

Airborne lead emissions are currently associated principally with industrial sources. Lead in gasoline has been banned under the CAA and would not be emitted from any other component of Proposed Action. Therefore, analysis of this pollutant was not warranted.

RESPIRABLE PARTICULATE MATTER—PM_{10} AND $PM_{2.5}$

PM is a broad class of air pollutants that includes discrete particles of a wide range of sizes and chemical compositions, as either liquid droplets (aerosols) or solids suspended in the atmosphere. The constituents of PM are both numerous and varied, and they are emitted from a wide variety of sources (both natural and anthropogenic). Natural sources include the condensed and reacted forms of naturally occurring VOC; salt particles resulting from the evaporation of sea spray; wind-borne pollen, fungi, molds, algae, yeasts, rusts, bacteria, and material from live and decaying plant and animal life; particles eroded from beaches, soil, and rock; and particles emitted from volcanic and geothermal eruptions and from forest fires. Naturally occurring PM is generally greater than 2.5 micrometers in diameter. Major anthropogenic sources include the combustion of fossil fuels (e.g., vehicular exhaust, power generation, boilers, engines, and home heating), chemical and manufacturing processes, all types of construction, agricultural activities, as well as wood-burning stoves and fireplaces. PM also acts as a substrate for the adsorption (accumulation of gases, liquids, or solutes on the surface of a solid or liquid) of other pollutants, often toxic, and some likely carcinogenic compounds.

As described below, PM is regulated in two size categories: particles with an aerodynamic diameter of less than or equal to 2.5 micrometers ($PM_{2.5}$), and particles with an aerodynamic diameter of less than or equal to 10 micrometers (PM_{10}, which includes $PM_{2.5}$). $PM_{2.5}$ has the ability to reach the lower regions of the respiratory tract, delivering with it other compounds that adsorb to the surfaces of the particles, and is also extremely persistent in the atmosphere. $PM_{2.5}$ is mainly derived from combustion material that has volatilized and then condensed to form primary PM (often soon after the release from a source) or from precursor gases reacting in the atmosphere to form secondary PM.

All gasoline-powered and diesel-powered vehicles, especially heavy duty trucks and buses operating on diesel fuel, are a significant source of respirable PM, most of which is $PM_{2.5}$; PM concentrations may, consequently, be locally elevated near roadways. Potential impacts on PM concentrations from the sources associated with the Proposed Action were evaluated.

SULFUR DIOXIDE

SO_2 emissions are primarily associated with the combustion of sulfur-containing fuels (oil and coal). SO_2 is also of concern as a precursor to $PM_{2.5}$ and is regulated as a $PM_{2.5}$ precursor under the New Source Review permitting program for large sources. Due to the federal restrictions on the sulfur content in diesel fuel for on-road and non-road vehicles, no significant quantities are emitted from vehicular sources. Vehicular sources of SO_2 are not significant; therefore, no evaluation of SO_2 from mobile sources is required.

As part of the MOD Development Plan, fuel oil was assumed to be a possible fuel for the heat and hot water systems for the buildings since detailed design is not yet available. Therefore, an evaluation of SO_2 with the MOD Development Plan's stationary sources was conducted at potential sensitive receptors.

C. AIR QUALITY REGULATIONS, STANDARDS, AND BENCHMARKS

NATIONAL AND STATE AIR QUALITY STANDARDS

As required by the CAA, primary and secondary National Ambient Air Quality Standards (NAAQS) have been established for six major air pollutants: CO, NO_2, ozone, respirable PM (both $PM_{2.5}$ and PM_{10}), SO_2, and lead. The primary standards represent levels that are requisite to protect the public health, allowing an adequate margin of safety. The secondary standards are intended to protect the nation's welfare, and account for air pollutant effects on soil, water, visibility, materials, vegetation, and other aspects of the environment. The primary standards are generally either the same as the secondary standards or more restrictive. The NAAQS are presented in **Table 12-1**. The NAAQS for CO, annual NO_2, and 3-hour SO_2 have also been adopted as the ambient air quality standards for New York State, but are defined on a running 12-month basis rather than for calendar years only. New York State also has standards for total suspended particles, settleable particles, non-methane hydrocarbons, 24-hour and annual SO_2, and ozone which correspond to federal standards that have since been revoked or replaced, and for the noncriteria pollutants beryllium, fluoride, and hydrogen sulfide.

Table 12-1
National Ambient Air Quality Standards (NAAQS)

Pollutant	Primary		Secondary	
	ppm	µg/m^3	ppm	µg/m^3
Carbon Monoxide (CO)				
8-Hour Average [1]	9	10,000	None	
1-Hour Average [1]	35	40,000		
Lead				
Rolling 3-Month Average	NA	0.15	NA	0.15
Nitrogen Dioxide (NO_2)				
1-Hour Average [2]	0.100	188	None	
Annual Average	0.053	100	0.053	100
Ozone (O3)				
8-Hour Average [3,4]	0.070	150	0.070	150
Respirable Particulate Matter (PM_{10})				
24-Hour Average [1]	NA	150	NA	150
Fine Respirable Particulate Matter ($PM_{2.5}$)				
Annual Mean [5]	NA	12	NA	15
24-Hour Average [6]	NA	35	NA	35
Sulfur Dioxide (SO_2)				
1-Hour Average[7]	0.075	196	NA	NA
Maximum 3-Hour Average [1]	NA	NA	0.50	1,300

Notes:
ppm – parts per million (unit of measure for gases only)
µg/m^3 – micrograms per cubic meter (unit of measure for gases and particles, including lead)
NA – not applicable
All annual periods refer to calendar year.
Standards are defined in ppm. Approximately equivalent concentrations in µg/m^3 are presented.
(1) Not to be exceeded more than once a year.
(2) 3-year average of the annual 98th percentile daily maximum 1-hr average concentration.
(3) 3-year average of the annual fourth highest daily maximum 8-hr average concentration.
(4) USEPA has lowered the NAAQS down from 0.075, effective December, 2015.
(5) 3-year average of annual mean.
(6) Not to be exceeded by the annual 98th percentile when averaged over 3 years.
(7) 3-year average of the annual 99th percentile daily maximum 1-hr average concentration.
Source: 40 CFR Part 50: National Primary and Secondary Ambient Air Quality Standards.

Effective December 2015, USEPA reduced the 2008 ozone NAAQS, lowering the primary and secondary NAAQS from the current 0.075 ppm to 0.070. USEPA issued final area designations for the revised on April 30, 2018.

Federal ambient air quality standards do not exist for noncriteria pollutants; however, the New York State Department of Environmental Conservation (NYSDEC) has issued standards for certain noncriteria compounds, including beryllium, gaseous fluorides, and hydrogen sulfide. NYSDEC has also developed guideline concentrations for numerous noncriteria pollutants. The NYSDEC Division of Air Resources (DAR) guidance document DAR-1[1] contains a compilation of annual and short term (1-hour) guideline concentrations for these compounds. The NYSDEC guidance thresholds represent ambient levels that are considered safe for public exposure. USEPA has also developed guidelines for assessing exposure to noncriteria pollutants. These exposure guidelines are used in health risk assessments to determine the potential effects to the public.

NAAQS ATTAINMENT STATUS AND STATE IMPLEMENTATION PLANS

The CAA, as amended in 1990, defines non-attainment areas (NAA) as geographic regions that have been designated as not meeting one or more of the NAAQS. When an area is designated as non-attainment by EPA, the state is required to develop and implement a State Implementation Plan (SIP), which delineates how a state plans to achieve air quality that meets the NAAQS under the deadlines established by the CAA, followed by a plan for maintaining attainment status once the area is in attainment.

The five New York City counties and Nassau, Suffolk, Rockland, Westchester, and Orange Counties, which had been designated as a $PM_{2.5}$ non-attainment area since 2004 under the CAA due to exceedance of the 1997 annual average standard, and which was also nonattainment with the 2006 24-hour $PM_{2.5}$ NAAQS since November 2009, were redesignated as in attainment for these standards on April 18, 2014, and are now under a maintenance plan. USEPA lowered the annual average primary standard to 12 $\mu g/m^3$ effective March 2013. USEPA designated the area as in attainment for the 12 $\mu g/m^3$ NAAQS effective January 15, 2015.

Westchester County is currently in attainment for the 24-hour average PM_{10} standard.

Effective June 15, 2004, USEPA designated Nassau, Rockland, Suffolk, Westchester, and the five New York City counties (NY portion of the New York–Northern New Jersey–Long Island, NY-NJ-CT, NAA as a "moderate" non-attainment area for the 1997 8-hour average ozone standard. In March 2008, USEPA strengthened the 8-hour ozone standards. USEPA designated the New York–Northern New Jersey–Long Island, NY-NJ-CT NAA as a "marginal" NAA for the 2008 ozone NAAQS, effective July 20, 2012. On April 11, 2016, as requested by New York State, USEPA reclassified the area as a "moderate" NAA. New York State began submitting SIP documents in December 2014. On July 19, 2017 NYSDEC announced that the NYMA is not projected to meet the July 20, 2018 attainment deadline and NYSDEC is therefore requesting that USEPA reclassify the NYMA to "serious" nonattainment, which would impose a new attainment deadline of July 20, 2021 (based on 2018-2020 monitored data). On November 18, 2018, USEPA proposed reclassifying the NYMA from moderate to serious nonattainment. On April 30, 2018, USEPA designated the same area as a moderate NAA for the revised 2015 ozone standard.

EPA has designated the entire state of New York as "unclassifiable/attainment" of the 1-hour NO_2 standard effective February 29, 2012. Since additional monitoring is required for the 1-hour standard, areas will be reclassified once three years of monitoring data are available (likely 2017).

[1] NYSDEC. *DAR-1: Guidelines for the Evaluation and Control of Ambient Air Contaminants Under Part 212*. August 2016.

EPA has established a 1-hour SO_2 standard, replacing the former 24-hour and annual standards, effective August 23, 2010. . In December 2017, USEPA designate the entire State of New York as in attainment for this standard, with the exception of Monroe County which was designated 'unclassifiable'.

DETERMINING THE SIGNIFICANCE OF AIR QUALITY IMPACTS

The State Environmental Quality Review Act (SEQRA) regulations state that the significance of a predicted consequence of a project (i.e., whether it is material, substantial, large or important) should be assessed in connection with its setting (e.g., urban or rural), its probability of occurrence, its duration, its irreversibility, its geographic scope, its magnitude, and the number of people affected.[1] In terms of the magnitude of air quality impacts, any action predicted to increase the concentration of a criteria air pollutant to a level that would exceed the concentrations defined by the NAAQS (see **Table 12-1**) would be deemed to have a potential significant adverse impact.

D. METHODOLOGY

MOBILE SOURCE SCREENING ANALYSIS

Screening analyses were undertaken to evaluate the potential effect of the Proposed Action on CO and PM concentrations using the results of the traffic analysis, and includes all components and growth in background traffic. The analyses were based on procedures and recommendations from the latest New York State Department of Transportation (NYSDOT) guidance found in *The Environmental Manual (TEM),* and traffic data (i.e., volume diagrams, HCS outputs, etc.) from the Traffic Impact Study (TIS).

CARBON MONOXIDE

Screening criteria described in NYDOT's *TEM* were employed to determine whether the Proposed Action requires a detailed air quality analysis at the intersections in the Study Area. The screening criteria determine whether the Proposed Action would increase traffic volumes or implement any other changes (*e.g.*, changes in speed, roadway width, sidewalk locations, or traffic signals) to the extent that significant increases in air pollutant concentrations could be expected, requiring further detailed analysis.

According to the screening procedures, if the With Action condition LOS is A, B, or C, no air quality analysis is required. For each intersections or corridor operating at LOS D or worse, the following Capture Criteria are applied to determine if an air quality analysis may be warranted:

- a 10 percent or more reduction in the distance between source and receptor (*e.g.*, street or highway widening); or
- a 10 percent or more increase in traffic volume on affected roadways for the build year; or
- a 10 percent or more increase in vehicle emissions for the build year using speed-based emission factor; or
- any increase in the number of queued lanes for the build year (this applies to intersections); it is not expected that intersections in the build condition controlled by stop signs would require an air quality analysis; or
- a 20 percent reduction in speed when build average speeds are below 30 miles per hour (mph).

[1] New York State Environmental Quality Review Regulations, 6 NYCRR § 617.7

If the Proposed Action does not meet any of the above criteria, a microscale analysis is not required.

Should any one of the above Capture Criteria be met, a Volume Threshold Screening is performed, using traffic volume and emission factor data to compare with specific volume thresholds established in NYSDOT's *TEM*. The volume thresholds establish traffic volumes in which a violation of the NAAQs for CO is extremely unlikely. This approach uses region-specific emissions data to determine corresponding vehicle thresholds.

Both the Capture Criteria and Volume Threshold Screening were developed by NYSDOT to be conservative air quality estimates based on worst-case assumptions. NYSDOT's *TEM* states that if the project-related traffic volumes are below the Volume Threshold criteria, then a microscale air quality analysis is unnecessary even if the other Capture Criteria are met for a location with LOS D or worse, since a violation of the NAAQS would be extremely unlikely.

PARTICULATE MATTER

In order to evaluate whether a detailed microscale analysis of PM is required, NYSDOT's *TEM* states that PM microscale screening and analysis should be based on the USEPA guidance *Transportation Conformity Guidance to Quantitative Hot-spot Analyses in $PM_{2.5}$ and PM_{10} Nonattainment and Maintenance Areas*. The USEPA guidance lists the types of projects that could be of concern for PM. These projects include those that have a substantial number or would substantially increase the number of diesel vehicles. Considerations of the vehicle mix expected under the Proposed Action as well as travel speed and sensitive receptors were used to determine whether a refined microscale modeling analysis would be warranted for PM.

STATIONARY SOURCE SCREENING ANALYSIS

PROPOSED PROJECT

The stationary sources of air pollutants associated with the Proposed Project would not be a major source of stationary source emissions. However, since there would be potential green space on the roof of the medical office building on the Gyrodyne Project Site, a screening analysis was performed using the USEPA AERSCREEN model to assess potential 1-hour average NO_2 and 24-hour and annual average $PM_{2.5}$ impacts from the heat and hot water system's sources introduced by the MOD Development Plan.

Model Selection

Potential pollutant concentrations from the Proposed Project's heat and hot water systems were evaluated using the latest version of EPA's AERSCREEN model (version 16216). The AERSCREEN model projects worst-case 1-hour average concentrations downwind from a point, area, or volume source, and longer-period averages are estimated by multiplying the 1-hour results by persistence factors established by USEPA. AERSCREEN generates application-specific worst-case meteorology using representative minimum and maximum ambient air temperatures, and site-specific surface characteristics such as albedo, Bowen ratio, and surface roughness length.[1] The

[1]. Albedo is the fraction of the total incident solar radiation reflected by the ground surface. The Bowen ratio is the ratio of the sensible heat flux to the latent (evaporative) heat flux. The surface roughness length is related to the height of obstacles to the wind flow and represents the height at which the mean horizontal wind speed is zero based on a logarithmic profile.

AERSCREEN model was used to calculate worst-case ambient concentrations of NO_2 and $PM_{2.5}$ from the Proposed Project downwind of the stack.

The model incorporates the Plume Rise Model Enhancements (PRIME) downwash algorithm, which is designed to predict concentrations in the "cavity region" (i.e., the area around a structure which under certain conditions may affect an exhaust plume, causing a portion of the plume to become entrained in a recirculation region). AERSCREEN uses the Building Profile Input Program for PRIME (BPIPPRM) to provide a detailed analysis of downwash influences on a direction-specific basis. AERSCREEN also incorporates AERMOD's complex terrain algorithms and utilizes the AERMAP terrain processor to account for the actual terrain in the vicinity of the source on a direction-specific basis.

The AERSCREEN model was run with the influence of building downwash, using urban diffusion coefficients that were based on a review of land-use maps of the area. Other model options were selected based on USEPA guidance.

Emission Rates and Stack Parameters

The nearest proposed buildings that were lower in height than the green space on the roof of the medical building on the Gyrodyne Project Site were considered. This includes a one-story building with 1,000 gross-square feet (gsf) restaurant space and a two-story building with 30,000 gsf of mixed retail and medical uses. Emission rates for the heating and hot water systems for these buildings were calculated based on fuel consumption estimates using energy intensity estimates based on type of development and size of the buildings, and applying federal emission factors for boilers utilizing fuel oil as a worst-case assumption.[1] In order to account for peak emission rates for short-term averages, emission rates were further scaled to account for a 100-day heating season. The exhaust from the heat and hot water systems was assumed to be vented through a single stack located three feet above the roof of the nearest building at a height of approximately 18 feet above grade and a distance of approximately 215 feet.

To calculate the exhaust flow rate, the estimated fuel consumption of the Proposed Project's heating and hot water systems was multiplied by USEPA's fuel factor for fuel oil[2] providing the exhaust flow rate at standard temperature; the flow rate was then corrected for the exhaust temperature. The exhaust velocity was then calculated based on the estimated stack diameter and calculated exhaust flow rate. Assumptions for stack diameter and exhaust temperature for the proposed systems were obtained from a survey of boiler exhaust data prepared and provided by New York City Department of Environmental Protection (DEP),[3] and were used to calculate the exhaust velocity.

The emission rates and exhaust stack parameters used in the AERSCREEN analyses are presented in **Table 12-2.**

Maximum 1-hour average NO_2 concentrations were estimated using an NO_2 to NO_x ratio of 0.8—the recommended default ambient ratio per USEPA guidance.[4]

Modeled concentrations were added to representative background concentrations in the area and compared with the NAAQS.

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1. USEPA. *Compilation of Air Pollutant Emission Factors AP-42*. 5th Ed., V. I, Ch. 1.3. May 2010.
2. USEPA. *Standards of Performance for New Stationary Sources.* 40 CFR Chapter I Subchapter C Part 60. Appendix A-7, Table 19-2. 2013.
3. DEP. *Boiler Database*. E-mail communication from Mitchell Wimbish on August 11, 2017.
4. EPA. *Memorandum: Clarification on the use of AERMOD Dispersion Modeling for Demonstrating Compliance with the NO_2 National Ambient Air Quality Standard*. September 30, 2014.

Table 12-2
Exhaust Stack Parameters and Emission Rates - Proposed Project

Stack Parameter	Value
Stack Height (feet)	18
Stack Diameter (feet)(1)	2
Estimated Fuel Consumption (MMBtu/year)	1,398
Exhaust Flow Rate (acfm)(2)	150
Exhaust Temperature (degrees Fahrenheit)(1)	300
Emission Rate (grams/second)	
NO_2 (short-term)	0.011
$PM_{2.5}$ (short-term)	0.0015
SO_2 (short-term)	0.0001

Note:
1. Stack parameter assumptions are based on boiler specifications for similar sized systems from boiler permit data provided by DEP.
2. The stack exhaust flow rate was estimated based on the type of fuel and heat input rates.

EXISTING SOURCES

Since the existing NYPH facility is located directly across Route 202/35 from the existing medical office building on the Gyrodyne Project Site that would include potential sensitive receptors on the roof, an AERSCREEN analysis was also performed to assess potential 1-hour average NO_2 and 24-hour and annual average $PM_{2.5}$ impacts from the equipment at NYPH on the proposed green space.

Emissions were calculated based on boiler sizes described in permit information obtained for the facility, which includes two stack locations, one located on the Main Building of the facility, assumed to be located at a minimum distance of 575 feet from the proposed green space, and one located on the more recently developed South Building, assumed to be located at a minimum distance of 493 feet from the proposed green space.

The emission rates and exhaust stack parameters used in the AERSCREEN analysis are presented in **Table 12-3.**

Table 12-3
Exhaust Stack Parameters and Emission Rates – NYPH Facility

Stack Parameter	NYPH – Main Building	NYPH – South Buildng
Stack Height (feet) (1)	30	64
Fuel Type(1)	Fuel Oil	Natural Gas
Stack Diameter (feet) (1)	3	1.5
Exhaust Flow Rate (acfm) (2)	4,851	3,985
Exhaust Temperature (degrees Fahrenheit)(2)	300	300
Emission Rate (grams/second)		
NO_2 (short-term)	0.3391	0.2017
$PM_{2.5}$ (short-term)	0.0480	0.0153
SO_2 (short-term)	0.0036	0.0012

Notes:
1. Stack parameter assumptions are based on boiler specifications described in the State Facility Permit for the NYPH facility.
2. The stack exhaust flow rate was estimated based on the type of fuel and heat input rates.

Modeled concentrations from the Main Building and the South Building were conservatively added together, and the total concentrations were then added to representative background concentrations in the area and compared with the NAAQS. .

PARKING FACILITIES

The Proposed Project would include parking spaces in surface lots for both the Evergreen Manor Project Site and the Gyrodyne Project Site. Emissions from vehicles using the parking areas could potentially affect ambient levels of pollutants at receptors adjacent to the parking lot. An analysis was performed using the methodology delineated in the 2014 *CEQR Technical Manual* to calculate pollutant levels. Since the parking lot would be used by automobiles, the primary pollutants of concern are CO and PM.

Potential impacts from each of the parking lots on CO and PM concentrations at receptor locations were assessed. The CO concentrations were determined for the weekday AM and PM peak periods, when overall lot usage would be the greatest, considering the hours when the greatest number of vehicles would exit the facility. PM concentrations were determined for peak daily (24-hour) use. Emissions from vehicles entering, parking, and exiting the parking lots were estimated using the USEPA MOVES mobile source emission model based on county-specific hourly temperature and relative humidity data obtained from NYSDEC. All arriving and departing vehicles were conservatively assumed to travel at an average speed of 5 miles per hour within the parking facility. In addition, all departing vehicles were assumed to idle for 1 minute before exiting. Since the surface lots include several areas of separate lots, total usage for each site was conservatively used to assess the potential impacts that would be associated with the site.

A "near" and "far" receptor was placed on the sidewalk closest to the parking lot, and on the sidewalk across Route 202/35, respectively. To determine compliance with the NAAQS, CO concentrations were determined for the maximum 1- and 8-hour average periods. A persistence factor of 0.7 was used to convert the calculated 1-hour average maximum concentrations to 8-hour averages, and factors of 0.6 and 0.1 to convert maximum 1-hour $PM_{2.5}$ concentrations to 24-hour and annual averages, respectively, per USEPA guidance, accounting for meteorological variability over the longer averaging periods. Background and on-street concentrations were added to the modeling results to obtain the total ambient levels. The on-street concentrations were determined using the methodology in the Air Quality Appendix of the *CEQR Technical Manual*, utilizing traffic volumes projected for the Study Area.

E. EXISTING CONDITIONS

The Study Area does not have many large sources of pollution, however it includes parcels previously developed for the NYPH. The existing air quality can be characterized based on pollutant concentrations measured by the NYSDEC at air quality monitoring stations in the region. Representative concentrations are presented in **Table 12-4**. These values presented are consistent with the NAAQS format. For example, the 8-hour ozone concentration shown is the 3-year average of the 4th highest daily maximum 8-hour average concentrations. The concentrations were obtained from the 2017 New York State Ambient Air Quality Report, the most recent report available. As shown in Table 12-2, the recently monitored levels did not exceed the NAAQS.

Table 12-4
Representative Monitored Ambient Air Quality Data

Pollutant	Location	Units	Averaging Period	Concentrations	NAAQS
CO	Botanical Gardens	ppm	8-hour	0.30	9
			1-hour	0.35	35
SO_2	Botanical Gardens[1]	ppb	1-hour	7.67	196
PM_{10}	IS 52	$\mu g/m^3$	24-hour	27	150
$PM_{2.5}$	Botanical Gardens[2]	$\mu g/m^3$	Annual	8	15
			24-hour	22.5	35
NO_2	Botanical Gardens[3]	$\mu g/m^3$	1-hour	57.5	188
			Annual	14.91	100
Lead	IS 52	$\mu g/m^3$	3-month	0.0041	0.15
O_3	White Plains[4]	ppm	8-hour	0.073	0.075

Notes:
(1) The 1-hour value is based on a three-year average (2015-2017) of the 99th percentile of daily maximum 1-hour average concentrations. USEPA replaced the 24-hr and the annual standards with the 1-hour standard.
(2) The 24-hour value is based on a three-year average (2015-2017) of the 98th percentile of daily maximum 24-hour average concentrations.
(3) The 1-hour value is based on a three-year average (2015-2017) of the 98th percentile of daily maximum 1-hour average concentrations.
(4) The three-year average (2010-2012) of the annual fourth-highest daily maximum 8-hr average concentration for Region 3 White Plains, NYSDEC 2017.
Source: Annual New York State Air Quality Reports, NYSDEC 2017.

F. FUTURE WITHOUT THE PROPOSED ACTION (NO ACTION CONDITION)

In the future without the Proposed Action, air quality in the area would generally continue to improve due to federal and state efforts at reducing emissions from all sources. Traffic conditions in the No Action Condition are considered in the mobile source screening procedures.

G. PROBABLE IMPACTS OF THE PROPOSED ACTION (WITH ACTION CONDITION)

2021 MOD DEVELOPMENT PLAN

The Proposed Project would introduce relatively small stationary sources at sufficiently large distances from the nearest sensitive locations, and the traffic increments associated with the Proposed Project would not exceed screening levels, as described below. Overall the Proposed Project would not cause significant adverse air quality impacts.

MOBILE SOURCES

Traffic data was reviewed based on NYSDOT's *TEM* methodology. As described below, the results of the screening analysis show that none of the intersections affected by the Proposed Project would require a detailed microscale air quality analysis.

Carbon Monoxide

Area roadway intersections from the TIS were reviewed based on NYSDOT's *EPM* criteria for determining locations that may warrant a CO microscale air quality analysis. The screening analysis examined the LOS and projected volume increases by intersection approach.

LOS Screening Analysis

Results of the traffic capacity analysis performed for the 2021 With Action condition for the Weekday AM and Weekday PM peak hours were reviewed at each of the signalized intersections in the study area to determine the potential need for a microscale air quality analysis.

The LOS screening criteria were first applied to identify those intersections with LOS D or worse in the With Action condition. Based on the review of the intersections analyzed, the following five intersections were projected to operate at a LOS D or worse on approaches during any of the peak traffic periods analyzed:

- Lexington Avenue and Main Street / Route 6
- Lafayette Avenue / NY Presbyterian Driveway and Route 202/35
- Route 202/35 and Bear Mountain Parkway
- Croton Avenue / Maple Row and Route 202/35
- Route 202/35 and Lexington Avenue

Capture Criteria Screening Analysis

Further screening on the intersections identified in the LOS Screening Analysis was conducted using the Capture Criteria outlined above. This screening analysis indicated that for all five of the above intersections, either an increase in traffic volume or a reduction in speed to the levels described in the listed Capture Criteria would be met. Therefore, a volume threshold screening analysis was conducted for the five intersections.

Volume Threshold Screening

The volume thresholds establish traffic volumes in which a violation of the NAAQS for CO is extremely unlikely. This approach uses emissions data based on the travel speed and vehicle mix in the Study Area to determine corresponding volume thresholds. For intersections where approach volumes are equal to or less than the applicable thresholds, microscale air quality analysis is not required.

The intersection with the highest peak-hour volume projected for the 2021 build year would be at Croton Avenue / Maple Row and Route 202/35 with 3,267 vehicles, below the Volume Threshold criteria of 4,000 vehicles per hour for each approach. Applying the emission factors obtained from the USEPA MOVES2014b model for the corresponding location to the volume threshold, conservatively accounting for the new signals at signalized intersections, volume thresholds would not be exceeded at any of the evaluated intersections in the build year.

Therefore, a CO microscale air quality analysis is not necessary and the Proposed Project would not cause significant adverse air quality impacts from mobile sources on CO since this project would not increase traffic volumes, reduce source-receptor distances, or change other existing conditions to such a degree as to jeopardize continued attainment of the NAAQS.

Particulate Matter

The PM microscale screening analysis was based on the USEPA guidance *Transportation Conformity Guidance to Quantitative Hot-spot Analyses in $PM_{2.5}$ and PM_{10} Nonattainment and Maintenance Areas*. The current heavy vehicle percentages are generally 2 percent on local streets and 4 to 6 percent on major arterials in the Study Area, and the vehicle mix is not expected to change as a result of the MOD Development Plan. Since the percentage of diesel vehicles traveling

to the area would not increase, a microscale analysis for PM is not warranted and the Proposed Project would not cause significant adverse air quality impacts from mobile sources on PM.

STATIONARY SOURCES

Proposed Project

The maximum predicted 1-hour average NO_2 and 24-hour and annual average $PM_{2.5}$ AERSCREEN concentrations from the heat and hot water systems sources introduced by the MOD Development Plan on the nearest sensitive receptor location are presented in **Table 12-5**. Any off-site receptors would be further away from this sensitive receptor location and are expected to experience lower concentrations. As shown in the table, when added to the existing background concentrations, there were no predicted exceedances of the NAAQS.

Table 12-5
Maximum Modeled Pollutant Concentrations (µg/m^3)

Pollutant	Averaging Period	Maximum Modeled Concentration	Background Concentration	Total Concentration	NAAQS
NO_2	1-hour	17 (1)	108.2	125.1	188
	Annual	1.7	29.9	31.6	100
$PM_{2.5}$	24-hour	1.8	22.5	24.3	35
	Annual	0.3	8.9	9.2	12
SO_2	1-hour	0.2	20.1	20.3	196

Notes:
N/A – Not Applicable
1. The 1-hour average NO_2 concentration is estimated using NO_2 to NO_x ratio of 0.8 as per USEPA guidance.

Existing Sources

The maximum predicted 1-hour NO_2 and 24-hour and annual average $PM_{2.5}$ concentrations from the NYPH facility on sensitive receptor locations introduced by the MOD Development Plan are presented in Error! Reference source not found..

Table 12-6
Maximum Modeled Pollutant Concentrations (µg/m^3)

Pollutant	Averaging Period	Maximum Modeled Impact	Background	Total Concentration	NAAQS
NO_2	1-hour	78.1(1)	108.2	186.2	188
	Annual	7.8	29.9	37.7	100
$PM_{2.5}$	24-hour	6.9	22.5	29.4	35
	Annual	1.1	8.9	10.0	12
SO_2	1-hour	0.9	20.1	21	196

Notes:
N/A – Not Applicable
1. The 1-hour average NO_2 concentration is estimated using NO_2 to NO_x ratio of 0.8 as per USEPA guidance.

As shown in the table, when added to the existing background concentrations, there were no predicted exceedance of the NAAQS. These results are based on a screening level analysis conservatively adding the maximum predicted concentrations from each exhaust stack without the consideration of receptor-specific locations and meteorological variations and assumes the exhaust stack located on the Main Building of the facility is at a minimum distance of 575 feet from the

proposed green space, and the exhaust stack on the South Building of the facility is at a minimum distance of 493 feet from the proposed green space.

PARKING

Potential impacts from the parking lots for both the Gyrodyne and Evergreen Project Sites on CO and PM concentrations at receptor locations were evaluated. The maximum predicted eight-hour average CO concentration for any site is 1.8 ppm. This value includes a predicted concentration of 1.5 ppm from the proposed parking lot and a background level of 0.3 ppm. The maximum predicted concentration is substantially below the applicable NAAQS of 9 ppm.

The maximum predicted 24-hour and annual average $PM_{2.5}$ concentrations are 29.7 $\mu g/m^3$ and 9.4 $\mu g/m^3$, respectively. These values include the background concentrations of 22.5 $\mu g/m^3$ and 8.9 $\mu g/m^3$, respectively, and are below the respective applicable NAAQS of 35$\mu g/m^3$ for the 24-hour average concentration and 12 $\mu g/m^3$ for the annual concentration. Therefore, the proposed parking lots would not result in any significant adverse air quality impacts.

2021 PROPOSED ZONING ACTION

MOBILE SOURCES

Similar to the screening analyses undertaken to evaluate the potential effect of the MOD Development Plan on CO and PM concentrations, the potential effect of the Proposed Zoning Action on CO and PM concentrations were conducted.

Carbon Monoxide

As described below, the results of the screening analysis show that none of the intersections studied would require a detailed microscale air quality analysis.

LOS Screening Analysis

Results of the traffic capacity analysis performed for the 2021 With Action condition, for the Weekday AM and Weekday PM peak hours were reviewed at each of the signalized intersections in the study area to determine the potential need for a microscale air quality analysis.

The LOS screening criteria were first applied to identify those intersections with LOS D or worse in the With Action condition. Based on the review of the intersections analyzed, the following six intersections were projected to operate at a LOS D or worse on approaches during any of the peak traffic periods analyzed under the Proposed Zoning Action:

- Lexington Avenue and Main Street / Route 6
- Lafayette Avenue / NY Presbyterian Driveway and Route 202/35
- Route 202/35 and Conklin Avenue
- Route 202/35 and Bear Mountain Parkway
- Croton Avenue / Maple Row and Route 202/35
- Route 202/35 and Lexington Avenue

Capture Criteria Screening Analysis

Further screening on the intersections identified in the LOS Screening Analysis was conducted using the Capture Criteria outlined above. This screening indicated that for all six of the above intersections, one of the listed Capture Criteria would be met. For the segments where speed data were not available, it was conservatively assumed that the criterion was met for reduction of speed. Therefore, a volume threshold screening analysis was conducted for the five intersections.

Volume Threshold Screening

The volume thresholds establish traffic volumes in which a violation of the NAAQs for CO is extremely unlikely. This approach uses emissions data based on the travel speed and vehicle mix in the Study Area to determine corresponding volume thresholds. For intersections where approach volumes are equal to or less than the applicable thresholds, microscale air quality analysis is not required.

The intersection with the highest peak-hour volume projected for 2021 would be at Croton Avenue/Maple Row and Route 202/35 with 3,441 vehicles below the Volume Threshold criteria of 4,000 vehicles per hour for each approach. Applying the emission factors obtained from the USEPA MOVES2014b model for the corresponding location to the volume threshold, conservatively accounting for the new signals at signalized intersections, volume thresholds would not be exceeded at any of the evaluated locations in the build year.

Therefore, a CO microscale air quality analysis is not necessary and the Proposed Zoning Action would not cause significant adverse air quality impacts from mobile sources on CO since this project would not increase traffic volumes, reduce source-receptor distances, or change other existing conditions to such a degree as to jeopardize continued attainment of the NAAQS.

Particulate Matter

Similar to patterns expected for the Proposed Project, vehicle mix is not expected to change as a result of the Proposed Zoning Action. Since the percentage of diesel vehicles traveling to the area would not meaningfully increase, a microscale analysis for PM is not warranted and the Proposed Zoning Action would not cause significant adverse air quality impacts from mobile sources on PM.

STATIONARY SOURCES

The Proposed Zoning Action would allow for additional medical use at the NYPH facility beyond the MOD Development Plan; however, it is expected that the existing boiler capacity would be sufficient to cover this expanded usage. If the additional medical use requires the need for additional boiler capacity to support increased heating and hot water loads, the exhaust stack(s) would need to be located at a sufficient distance away from the green space on the Gyrodyne Project Site to preclude any potential significant adverse air quality impacts. Any additional equipment that may be required for this expansion would also need to be permitted with NYSDEC and would need to be in compliance with all federal, state, and local regulations. As this is a GEIS, additional assessment may be required once the program is finalized.

PARKING ANALYSIS

The parking demand for the Proposed Zoning Action was reviewed. The use at each site is projected to experience similar or slightly less than the overall demand projected for the MOD Development Plan. Therefore similar levels of emissions from vehicles entering and exiting the surface lots would be expected. Therefore, the proposed parking lots would not result in any significant adverse air quality impacts.

H. MITIGATION

Emissions from vehicles generated by the Proposed Action would be unavoidable, but are not considered impacts as none of the screening locations for mobile source emissions exceed the volume threshold criteria for either carbon monoxide or particulate matter established by NYSDOT. Emissions from stationary sources (heat and hot water systems) are also considered unavoidable, but are not considered impacts as none of the stationary sources individually or

collectively are large enough to require any air quality permits, they would be located a large distance from any sensitive receptor, and because ambient pollutant concentrations are substantially lower than NAAQS. Since the Proposed Action would not result in any significant adverse air quality impacts based on current assumptions, no mitigation is required. ✷