Appendix F: Greenhouse Gas Emissions[1]

A. INTRODUCTION

There is general consensus in the scientific community that the global climate is changing as a result of increased concentrations of Greenhouse Gas (GHG) in the atmosphere. As a consequence, government policies have begun to address GHG emissions at global, national, and local levels, including New York City's GHG reduction goals outlined in PlaNYC 2030.

Subsequent to the publication of the DEIS, the City released a revised *City Environmental Quality Review (CEQR) Technical Manual* (May 17, 2010), which updates the methodologies and criteria set forth in the 2001 *CEQR Technical Manual* that was the basis for the analyses contained in this FEIS. The 2010 *CEQR Technical Manual* provides guidance for an assessment of the potential GHG emissions associated with a project such as the proposed Flushing Commons and the Macedonia Plaza projects ("Proposed Project"). In anticipation of, and prior to, the issuance of the revised *CEQR Technical Manual* guidance for a GHG emissions assessment, the proposed project's GHG emissions were assessed based on preliminary methodologies previously utilized in some earlier environmental reviews. To the extent necessary, those methodologies have been revised to reflect the new guidance. While the methodologies used in this section differ slightly from those methodologies provided in the revised *CEQR Technical Manual*, they appear to be as conservative as the recommended methodologies provided in the revised guidance and to provide sufficient information to conduct an adequate and appropriate GHG assessment.

The proximity of the proposed development to public transportation, its mixed-use, and dense design are all factors that contribute to the energy efficiency of the proposed Flushing Commons and the Macedonia Plaza projects, resulting in lower GHG emissions. In addition, the project sponsors are committed to implementing a number of voluntary measures that would further improve the energy efficiency of the Proposed Project and reduce potential GHG emissions.

B. ANALYSIS APPROACH

Although the contribution of any single project to climate change is infinitesimal, the combined GHG emissions from all human activity have a severe adverse impact on global climate. While the increments of criteria pollutants and toxic air emissions are assessed in the context of health-based standards and local impacts, there are no established thresholds for assessing the significance of a project's contribution to climate change. Nonetheless, prudent planning dictates that all sectors address GHG emissions by identifying GHG sources and practicable means to reduce them.

[1] This appendix is new to the FEIS.

Therefore, this section does not identify the relative increment in GHG emissions due to the proposed Flushing Commons and the Macedonia Plaza projects as compared with a No Build scenario, but rather presents an estimate of the total GHG emissions associated with the Proposed Project and identifies the measures incorporated into the projects to limit those emissions. Note that much of these emissions would be associated with similar activity regardless of the Proposed Project. For example, if buildings were to be constructed elsewhere to accommodate the same number of people as the Proposed Project, the emissions from the use of electricity, energy for heating and hot water, vehicle use, and construction materials could equal or exceed those of the Proposed Project, depending on their location, access to transit, building type, construction materials, and energy efficiency measures.

The GHG emissions generated by various activities (steam and fuel use for heat and hot water, electricity use, and vehicle use) are presented for the proposed Flushing Commons and the Macedonia Plaza projects. A summary of annual operational GHG emissions are presented for a reasonable worst-case scenario. The estimates for building energy use were performed for two development scenarios for the Flushing Commons project. Construction emissions are discussed as well.

C. POLLUTANTS OF CONCERN

GHGs are those gaseous constituents of the atmosphere, from both natural and anthropogenic (i.e., resulting from the influence of human beings) emission sources, that absorb infrared radiation (heat) emitted from the earth's surface, the atmosphere, and clouds. This property causes the general warming of the earth's atmosphere, or the "greenhouse effect." Water vapor, carbon dioxide (CO_2), nitrous oxide, methane, and ozone are the primary greenhouse gases in the earth's atmosphere.

Moreover, there are a number of entirely human-made GHGs in the atmosphere, such as halocarbons and other chlorine- and bromine-containing substances, which are also responsible for damaging the stratospheric ozone layer (creating the "ozone hole"). Since these compounds are being replaced and phased out from use due to the 1987 Montreal Protocol, there is generally no need to address these chemicals in GHG assessments of residential and commercial uses, which are not sources of those gases. Ozone itself is also a substantial GHG; however, long-term project-level impacts on ozone emissions as a GHG do not need to be analyzed, since ozone is a rapidly reacting chemical, and since efforts are ongoing to reduce the production of ozone as a criteria pollutant.

Although water vapor is of great importance to global climate change, it is not directly of concern as an emitted pollutant, since the miniscule quantities of anthropogenic emissions are of no consequence. However, an increase in global temperature can increase evaporation and thereby, indirectly, cause further atmospheric warming.

CO_2 is the primary pollutant of concern from anthropogenic emission sources. CO_2 is by far the most abundant and has the greatest overall impact on global average atmospheric temperature. CO_2 is emitted as a product of combustion (both natural and anthropogenic), from some industrial processes such as the manufacture of cement, mineral production, metal production, and the use of petroleum-based products, from volcanic eruptions, and from the decay of organic matter. CO_2 is removed ("sequestered") from the lower atmosphere by natural processes such as photosynthesis and uptake[2] by the oceans. CO_2 is included in any analysis of GHG emissions.

[2] Biological and chemical processes by which CO_2 is removed from the atmosphere and stored in the oceans.

Methane and nitrous oxide also play an important role in global climate change, since they have longer atmospheric lifetimes and a greater ability to absorb infrared radiation than an equal quantity of CO_2. Methane is emitted from agriculture, natural gas distribution, and decomposition of organic materials in landfills and wastewater treatment plants. Methane is also released from natural processes that include the decay of organic matter lacking sufficient oxygen, for example, in wetlands. Nitrous oxide is emitted from fertilizer use and fossil fuel burning. Natural processes in soils and the oceans also release nitrous oxide. Therefore, emissions of these compounds are included in GHG emissions analyses as appropriate.

Other GHGs—including certain hydrofluorocarbons (HFCs), used as refrigerants and foam blowers and released as byproducts from the production of other HFCs; some perfluorocarbons (PFCs), produced as byproducts of traditional aluminum production, among other activities; and sulfur hexafluoride (SF_6), used as an electrical insulating fluid in power distribution equipment—are sometimes included in GHG emissions analyses where relevant (e.g., analysis of manufacturing facilities), but are not included in the analysis of the Proposed Project, since the Proposed Project would not result in significant emissions of these GHGs.

D. POLICY, REGULATIONS, STANDARDS, AND BENCHMARKS

As a result of the growing consensus that human activity resulting in GHG emissions has the potential to profoundly impact the earth's climate, countries around the world have undertaken efforts to reduce emissions by implementing both global and local measures addressing energy consumption and production, land use, and other sectors. Although the U.S. has not ratified the international agreements which set emissions targets for GHGs, in a step toward the development of national climate change regulation, in June 2009 the U.S. House of Representatives passed the American Clean Energy and Security Act (ACES, "cap and trade bill"). The proposed legislation would place a national cap on GHG emissions, resulting in the gradual reduction of emission from large sources (accounting for approximately 85 percent of the U.S. GHG emissions) to 17 percent lower than 2005 levels by 2020 and to 83 percent lower than 2005 levels by 2050. ACES calls for the long-term investment of billions of dollars in energy efficiency and renewable energy, carbon capture and storage, electric and other advanced technology vehicles, and basic scientific research and development in related fields. Although this legislative activity is still in progress, without such legislation EPA would be required to regulate greenhouse gases under the Clean Air Act, and has already begun preparing regulations.

EPA has established various voluntary programs to reduce emissions and increase energy efficiency and has recently embarked on a few regulatory initiatives related to GHG emissions, including regulation of geological sequestration of CO_2, and a GHG reporting rule to collect information on GHG emissions as pollutants.

The Energy Independence and Security Act of 2007 includes provisions for increasing the production of clean renewable fuels, increasing the efficiency of products, buildings, and vehicles, and for promoting research on greenhouse gas capture and storage options. The most recent renewable fuel standards regulations (February 2010) require 12.95 billion gallons of renewable fuels to be produced in 2010, increasing annually up to 36.0 billion gallons in 2022. The renewable fuel standards regulations also set volume standards for specific categories of renewable fuels including cellulosic, biomass-based diesel, and total advanced renewable fuels, and specify lifecycle GHG reduction thresholds ranging from 20 percent for renewable fuel to 60 percent for cellulosic biofuel (as compared to the baseline gasoline or diesel replaced).

The American Recovery and Reinvestment Act of 2009 (ARRA, "economic stimulus package") funds actions and research that can lead to reduced GHG emissions. Renewable energy tax credits have also been extended. Funds from ARRA are currently being disbursed.

In March 2009, the U.S. Department of Transportation (USDOT) set combined corporate average fuel economy (CAFE) standards for light duty vehicles for the 2011 model year (MY). In June 2009, EPA granted California a previously denied waiver to regulate vehicular GHG emissions, allowing 19 other states (representing 40 percent of the light-duty vehicle market, including New York) to adopt the California mobile source GHG emissions standards. In April 2010, EPA and USDOT established the first GHG emission standards and more stringent CAFE standards for MY 2012 through 2016 light-duty vehicles. These regulations will all serve to reduce vehicular GHG emissions over time.

There are also regional, state, and local efforts to reduce GHG emissions. In 2009, Governor Paterson issued Executive Order No. 24, establishing a goal of reducing GHG emissions in New York by 80 percent, compared to 1990 levels, by 2050, and creating a Climate Action Council tasked with preparing a climate action plan outlining the policies required to attain the GHG reduction goal (that effort is currently under way[3]). The 2009 New York State Energy Plan,[4] outlines the state's energy goals and provides strategies and recommendations for meeting those goals. The state's goals include:

- Implementing programs to reduce electricity use by 15 percent below 2015 forecasts;
- Updating the energy code and enacting product efficiency standards;
- Reducing vehicle miles traveled by expanding alternative transportation options; and
- Implementing programs to increase the proportion of electricity generated from renewable resources to 30 percent of electricity demand by 2015.

New York State has also developed regulations to cap and reduce CO_2 emissions from power plants in order to meet its commitment to the Regional Greenhouse Gas Initiative (RGGI). Under the RGGI agreement, the governors of 10 northeastern and mid-Atlantic states have committed to regulate the amount of CO_2 that power plants are allowed to emit. The regional emissions from power plants will be held constant through 2014, and then gradually reduced to 10 percent below the initial cap through 2018. Each power source with a generating capacity of 25 megawatts or more would need to purchase a tradable CO_2 emission allowance for each ton of CO_2 it emits. The 10 RGGI states and Pennsylvania have also announced plans to reduce GHG emissions from transportation, through the use of biofuel, alternative fuel, and efficient vehicles.

Many local governments worldwide, including New York City, are participating in the Cities for Climate Protection™ (CCP) campaign and have committed to adopting policies and implementing quantifiable measures to reduce local GHG emissions, improve air quality, and enhance urban livability and sustainability.

New York City has a long-term sustainability program, PlaNYC 2030, which sets a citywide GHG emissions reduction goal of 30 percent below 2005 levels by 2030 (the "GHG reduction goal"). PlaNYC includes specific initiatives that can result in emission reductions and initiatives targeted at adaptation to climate change impacts. The New York City Climate Protection Act (enacted in 2007)

[3] http://www.nyclimatechange.us/

[4] New York State, *2009 New York State Energy Plan*, December 2009.

codified PlaNYC's GHG reduction goal in the Administrative Code of the City of New York. The law also requires the city to reduce GHG emissions from municipal operations to 30 percent less than fiscal year 2006 emissions by 2017. In December 2009, the New York City Council enacted four laws addressing energy efficiency in new and existing buildings, in accordance with PlaNYC. The laws require owners of existing buildings larger than 50,000 square feet to conduct energy efficiency audits every 10 years, to optimize building energy efficiency, and to "benchmark" the building energy and water consumption annually, using an EPA online tool. By 2025, commercial buildings over 50,000 square feet will also require lighting upgrades, including the installation of sensors and controls, more efficient light fixtures, and the installation of submeters, so that tenants can be provided with information on their electricity consumption. The legislation also creates a local New York City Energy Code, which requires equipment installed during a renovation to meet current efficiency standards.

A number of benchmarks for energy efficiency and green building design have also been developed. For example, the United States Green Building Council's (USGBC) Leadership in Energy and Environmental Design (LEED) system is a benchmark for the design, construction, and operation of high performance green buildings that includes energy efficiency components. EPA's Energy Star is a voluntary labeling program designed to identify and promote the construction of new energy efficient buildings, facilities, and homes and the purchase of energy efficient appliances, heating and cooling systems, office equipment, lighting, home electronics, and building envelopes.

Currently, there are no specific benchmarks or regulations applicable to GHG emission levels or impacts from actions subject to environmental review in New York State or New York City. Accordingly, the potential effects of the Proposed Project have been evaluated in the context of their consistency with the PlaNYC GHG reduction goal. Potential GHG emissions from the Proposed Project are assessed and disclosed, and the feasibility and practicability of various measures available for reducing GHG emissions are discussed. Commitments to implement such measures are noted, where applicable.

E. METHODOLOGY

To some extent, calculations in this analysis are based on the methodology provided in the revised *CEQR Technical Manual* (May 2010). Emissions of GHGs that would be associated with the Proposed Project have been quantified, including off-site emissions associated with use of electricity and steam for heat and hot water on-site, on-site emissions from heat and hot water systems, and emissions from vehicle use attributable to the Proposed Project. GHG emissions that would result from construction of the development are discussed as well.

GHG emissions for gases other than CO_2 are included where practicable or in cases where they comprise a substantial portion of overall emissions. The various GHG emissions are added together and presented as carbon dioxide equivalent (CO_2e) emissions—a sum which includes the quantity of each GHG weighted by a factor of its effectiveness as a GHG using CO_2 as a reference. This is achieved by multiplying the quantity of each GHG emitted by a factor called global warming potential (GWP). The GWP accounts for the lifetime and the radiative forcing of each gas over a

period of 100 years (e.g., CO_2 has a much shorter atmospheric lifetime than SF_6, and therefore has a much lower GWP). The GWPs for the main GHGs discussed are presented in Table 1.[5]

Table 1
Global Warming Potential (GWP) for Major GHGs

Compound	100-year Horizon GWP
Carbon Dioxide (CO_2)	1
Methane (CH_4)	21
Nitrous Oxide (N_2O)	310
Hydrofluorocarbons (HFCs)	140 to 11,700
Perfluorocarbons (PFCs)	6,500 to 9,200
Sulfur Hexafluoride (SF_6)	23,900
Sources: IPCC, Climate Change 1995—The Science of Climate Change: Contribution of Working Group I to the Second Assessment of the Intergovernmental Panel on Climate Change, 1996.	

EPA estimates that the well-to-pump GHG emissions of gasoline and diesel are approximately 22 percent of the tailpipe emissions.[6] Although upstream emissions (emissions associated with production, processing, and transportation) of all fuels can be substantial and are important to consider when comparing the emissions associated with the consumption of different fuels, they are not considered in the analysis for the Proposed Project, in accordance with the methodology used in developing the New York City GHG inventory. The GHG emissions are presented as metric tons of CO_2e per year, consistent with the New York City annual inventory.[7]

The Flushing Commons project is pursuing five separate LEED certifications for New Construction and Core and Shell under V2.2. For Macedonia Plaza, New York City Department of Housing Preservation and Development (HPD) requires all new construction projects to achieve Green Communities certification.[8] Under this program, the proposed buildings would be 15 percent more energy efficient than buildings constructed to current code. Although the project may ultimately achieve higher levels of efficiency, the calculations assume the minimum energy reduction required for LEED certification (10 percent) for Flushing Commons and for HPD's New Construction Program (15 percent), reflecting the incorporation of such measures into the Proposed Project.

All factors and procedures are based on the *2010 CEQR Technical Manual*, other than the energy consumption and associated emissions for the parking garage (Energy Calculations are presented in Chapter 13, "Energy." The energy consumption for the parking garage (in British thermal units, Btu) presented in Chapter 13, "Energy," was multiplied by the emission factors from the 2010 *CEQR Technical Manual* (kilograms of CO_2e per million Btu) to calculate the total emissions associated with the parking garage. As described in Chapter 13, "Energy,"

[5] Following standard protocol for greenhouse gas inventories, and consistent with New York City's GHG inventory, the GWP factors from IPCC's Second Assessment Report (1996) are used. These GWP factors are specified for use for national GHG inventories under the Kyoto Protocol.

[6] Environmental Protection Agency, *MOVES2004 Energy and Emission Inputs*, Draft Report, EPA420-P-05-003, March 2005.

[7] *Inventory of New York City Greenhouse Gas Emissions*, Mayor's Office of Long-Term Planning and Sustainability, PlaNYC2030, September 2009.

[8] Enterprise Community Partners, Green Communities Criteria, 2008.

emissions were estimated based on building square footage and the emissions intensity by use provided in the manual. This methodology was determined to be a reasonably conservative estimate of the proposed project's operational GHG emissions due to the fact that the default rates for city-wide energy consumption by existing buildings, as provided in the revised *CEQR Technical Manual*, were used; the new buildings associated with the Proposed Project would likely have lower energy demand.

The vehicle trips generated by the Proposed Project are discussed in Chapter 14, "Traffic and Parking." The annual number of car, taxi, and truck trips that could be attributed to the Proposed Project was calculated from average daily weekday and weekend person trips for each use group, percentage of trips by car and taxi, and average vehicle occupancy.

A simplified emissions procedure was used for calculating emission factors for on-road emissions. This analysis is expected to be a reasonably conservative estimate of on-road emissions. Total vehicle miles traveled (VMT) were calculated based on the 2010 *CEQR Technical Manual* procedures. The average car and truck fuel efficiencies of 21.2 miles per gallon (mpg) and 6.1 mpg, respectively, projected for the 2011 analysis year, were employed in estimating the annual fuel consumed by vehicle use connected with the proposed project.[9] It was assumed that all trucks would be diesel-fueled and that all cars would be gasoline-fueled. The GHG emission factors were based on the gasoline and diesel fuel carbon content,[10] assuming that all carbon is transformed to CO_2, resulting in emission factors of 8,877 grams (g) CO_2 per gallon of gasoline and 10,186 g CO_2 per gallon of diesel. Emissions are then calculated by dividing the distances (VMT) by the fuel efficiency (mpg) to obtain gallons of fuel, and then multiplying by the emission factor (g/gallon) to calculate the total emissions.

F. PROJECTED EMISSIONS FROM THE PROPOSED PROJECT

A summary of GHG emissions by emission source type, along with total annual emissions from the Proposed Project, is presented in Table 2. Overall, approximately half of the emissions are associated with building energy, and half with transportation.

According to EIA data, consumption of electricity and heating fuels for residential use in U.S. cities is approximately 20 percent lower than the equivalent use per household in suburban areas. Moreover, the per capita annual electricity consumed in New York City is almost 50 percent lower than the per capita annual electricity consumed nationwide.[11]

Table 2
Summary of Annual GHG Emissions

Sector	GHG Emissions (metric tons CO_2e)	
	Office Scenario	Hotel Scenario
Building Energy	11,067	10,786
Vehicle Use	13,963	14,764
TOTAL	*25,030*	*25,550*

[9] Energy Information Administration, An Updated Annual Energy Outlook 2009 Reference Case Reflecting Provisions of the American Recovery and Reinvestment Act and Recent Changes in the Economic Outlook, 2009. Table 7 Transportation Sector Key Indicators and Delivered Energy Consumption.

[10] The Code of Federal Regulations (40 CFR 600.113).

[11] *Inventory of New York City Greenhouse Gas Emission*, Mayor's Office of Long-Term Planning and Sustainability, PlaNYC2030, September 2009.

As presented above, energy-related emissions are conservatively high since default rates for city-wide energy consumption by existing buildings from the *CEQR Technical Manual* were applied; new buildings would likely have much lower energy demand.

Emissions associated with construction have not been estimated explicitly, but other similar analyses have shown that construction emissions (both direct and emissions embedded in the production of materials, including on-site construction equipment, delivery trucks, and upstream emissions from the production of steel, rebar, aluminum, and cement used for construction) are equivalent to the total emissions from the operation of the project over approximately 5 to 10 years. Most construction projects use some fraction of replacements for cement (such as slag or flyash) and recycled steel is commonly used as well, even when not specifically selected for environmental reasons. As described below, the project sponsor is investigating measures to further reduce the energy embedded in construction materials, including the use of recycled and/or local materials.

Overall, per capita GHG emissions in New York City are less than one-third of the nationwide average.[12] This is largely due to reduced vehicle use, denser development, and cleaner energy sources. Beyond that, the Proposed Project would reduce the emissions associated with electricity consumption and heating through energy-efficient design, and reduce emissions associated with transportation because of the available transit options.

G. PROJECT ELEMENTS THAT WOULD REDUCE GHG EMISSIONS

As mentioned above, the project will achieve higher energy efficiency due to the green building certification programs. The Flushing Commons project is pursuing five separate LEED certifications for New Construction and Core and Shell under V2.2. For Macedonia Plaza, HPD would require compliance with the New York State Energy Research and Development Authority's (NYSERDA's) Green Affordable Housing Component and Enterprise Community Partners' Green Communities ("Green Communities"). Green Communities is a subset of NYSERDA's Multifamily Performance Program, which is designed to improve the energy efficiency, health, safety, and security of new, affordable, multi-family residential buildings. This program serves new construction projects that contain five or more residential units where 25 percent of the households in the building maintain an income level at or below 80 percent of the New York State Median Income. For rental projects, Green Communities requires at least 25 apartments to be occupied by households at or below 60 percent of area median income. Projects participating in the Green Communities are required to attain the Energy Star label for mid- and high-rise buildings, receive incentives for the installation of green building features, and are required to attain LEED Silver certification.

Green Communities criteria promote smart growth, public health, energy conservation, operational savings, and sustainable building practices in affordable housing design, and the criteria contain detailed information addressing aspects of design, development, and operations, including: integrated design; site location and neighborhood fabric; site improvements; water conservation; energy efficiency; materials beneficial to the environment; healthy living

[12] *Inventory of New York City Greenhouse Gas Emission*, Mayor's Office of Long-Term Planning and Sustainability, PlaNYC2030, September 2009.

environment; and operations and maintenance. The Green Communities Criteria are aligned with the LEED for Homes rating system.

As described above, the minimum energy efficiency criteria for LEED (10 percent) and Green Communities (15 percent) were included in the calculations above.

In addition to the energy efficient design, the Proposed Project would include a number of measures aimed at reducing energy consumption and GHG emissions:

- **Site Selection:** The Proposed Project's mixed-use development would be situated in a downtown center with exceptional subway, rail, and bus access. The Project site would also be within walking distance of existing and proposed shopping, restaurants, and open spaces. The presence of dense development at this location would take advantage of the urban mass transit services and decrease the need for personal vehicle ownership.
- **Design and Uses:** The Proposed Project's mixed use development and dense design would result in a community that would be less automobile dependent. The project site is located in an area that is already developed and serviced by transit and existing infrastructure, and would therefore not result in GHG emissions associated with urban sprawl.

The development associated with the Proposed Project would be subject to any changes in the New York City Building Code that would require greater energy efficiency and further the goals of PlaNYC. These could include energy efficiency requirements, specifications regarding cement, and other issues influencing GHG emissions.

In addition to the energy and design features mentioned above, the measures listed below, which could result in further reduction in GHG emissions, are currently under consideration by the project sponsor. Implementing any of these measures would further reduce the GHG emissions from the Proposed Project and would be consistent with the GHG reduction goal:

1. BUILDING DESIGN AND OPERATION MEASURES TO REDUCE A BUILDING'S CARBON INTENSITY

    1.1. Construct green roofs.

    1.2. Eliminate or reduce use of refrigerants in HVAC systems.

    1.3. Use high-albedo roofing materials.

    1.4. Maximize interior daylighting.

    1.5. Incorporate motion sensors and lighting and climate control.

    1.6. Use water conserving fixtures that exceed building code requirements.

    1.7. Use building materials with recycled content.

    1.8. Use building materials that are extracted and/or manufactured within the region.

    1.9. Use rapidly renewable building materials.

    1.10. Use wood that is locally produced and/or certified in accordance with the Sustainable Forestry Initiative or the Forestry Stewardship Council's Principles and Criteria.

    1.11. Conduct 3rd party building commissioning to ensure energy performance.

    1.12. Provide construction and design guidelines to facilitate sustainable design for build-out by tenants.

2. SITE SELECTION AND DESIGN MEASURES

   2.1. Design project to support alternative transportation (walking and bicycling).

   2.2. Design water efficient landscaping.

3. TRANSPORTATION MEASURES

   3.1. Incorporate TOD principles in employee and customer activity patterns.

   3.2. Provide new transit service or support extension/expansion of existing transit (buses, trains, shuttles, water transportation).

   3.3. Develop or support multi-use paths to and through site.

   3.4. Size parking capacity to meet, but not exceed, parking required by zoning and, where possible, seek reductions in parking supply through special permits or waivers.

   3.5. Pursue opportunities to minimize parking supply through shared or banked parking.

   3.6. Provide bicycle storage and showers/changing rooms.

H. CONCLUSION

The potential GHG emissions associated with the Proposed Project have been calculated and are presented above. Measures for reducing GHG emissions included in the Proposed Project and additional relevant measures under consideration have been identified.

The maximum annual GHG emissions from the Proposed Project are predicted to be 25,550 metric tons of CO_2e. This does not represent a net increment in GHG emissions, since similar GHG emissions would occur if residential units and associated uses were to be constructed elsewhere, and could be higher if constructed with less energy efficiency, as lower density residential, further from employment and commercial uses, and/or with less access to transit service.

As described above, the project would incorporate energy efficient design and siting, and its sponsor is considering additional measures that would reduce the buildings' carbon intensity and/or encourage use of alternative transportation. Furthermore, the heating systems would utilize natural gas, which results in lower GHG emissions per unit of energy. The project is located near subway and bus service, resulting in lower usage of personal vehicles.

In addition to the site location and the dense, mixed-use design, the Proposed Project includes a commitment to achieve greater energy efficiency that would result in lower GHG emissions than would otherwise be achieved by comparable residential and commercial uses. Furthermore, other measures to further reduce the project's total GHG emissions are being considered. Taking into account all these measures, the Proposed Project is considered consistent with New York City's GHG reduction goals. ✷