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Greenhouse Gas Emissions and Climate Change

This chapter describes the potential impact of the Proposed Actions on greenhouse gas (GHG) emissions and considers whether the Proposed Actions are consistent with the Citywide GHG emissions reduction goals.

Introduction

The Applicant, Innovative Urban Living, LLC, is seeking several discretionary approvals from the City Planning Commission (CPC), including a zoning map amendment, zoning text amendments, and various special permits collectively referred to as the "Proposed Actions."

The Proposed Actions would facilitate the development of a mixed-use, purpose-built community on the campus of the Christian Cultural Center (CCC), which would be comprised of income-based affordable housing; a performing arts center (PAC); local retail; and a variety of community facilities targeted to the civic, economic, educational, and cultural needs of the East New York neighborhood (the Proposed Project). The Proposed Project would be developed in the East New York neighborhood of Brooklyn on Block 4430, Lot 1; and Block 4434, Lots 1 and 10 (the Development Site). The Proposed Actions would result in the development of approximately 1,645,820 gross square feet (gsf) of residential space, approximately 110,570 gsf of commercial uses, 100,904 gsf of community facility uses, public and private open space, and accessory and public parking related to the proposed on-site uses of approximately 343,244 gsf.

A portion of the Project Area is located within the 500-year flood plain (prone to flooding from 0.2 percent annual chance of storm)—as defined by Federal Emergency Management Agency (FEMA). Therefore, a storm surge or coastal flooding assessment was conducted for the Proposed Project.

As discussed in the *2021 CEQR Technical Manual*, increased concentrations of greenhouse gases change the global climate and result in wide-ranging effects on the environment, including rising sea levels, increases in temperature, and changes in precipitation levels. Although this is occurring on a global scale, the environmental effects of climate change are also likely to be felt at the local level. New York City's sustainable development policy, starting with PlaNYC and continued and enhanced in OneNYC, established sustainability initiatives and goals for greatly reducing GHG emissions and for adapting to climate change in the City. In 2014, the City Council passed a bill to reduce citywide greenhouse gas emissions by 80 percent by 2050 (Local Law 66 of 2014). The New York Climate Mobilization Act, Local Law 97 of 2019, the most recent legislation, is the most aggressive climate legislation to date. It requires buildings larger than 25,000 square feet to meet strict GHG emission limits starting in 2024. Buildings are the largest source of greenhouse gas emissions, representing nearly 70 percent of New York City's total emissions. Focusing on the city's largest buildings will promote energy efficiency and renewable energy and discourage reliance on fossil fuels. The GHG emission reduction goal for NYC buildings is 40 percent by 2030 and 80 percent by 2050, compared to 2005.

The contribution of a proposed project's GHG emissions to global GHG emissions is likely to be considered insignificant when measured against the scale and magnitude of global climate change. However, certain projects' contribution of GHG emissions still should be analyzed to determine their consistency with the City's GHG reduction goal, which is currently the most appropriate standard by which to analyze a project under CEQR. The GHG consistency assessment focuses on those projects that have the greatest potential to produce GHG emissions and evaluates their potential to result in significant inconsistencies with the GHG reduction goal.

Principal Conclusions

The Proposed Actions would be consistent with the applicable City GHG emissions reduction and climate change goals, and there would be no significant adverse GHG emission or climate change impacts as a result of the Proposed Actions.

Following the methodology provided in the *CEQR Technical Manual*, it is estimated that the Proposed Actions would result in approximately 7,682 metric tons of carbon dioxide equivalent (CO_2e) emissions from its annual operations and 8,110 metric tons a year of CO_2e emissions from mobile sources. This represents less than 0.03 percent of the City's overall 2019 GHG emissions of 55.1 million metric tons, an insignificant contribution.

The Proposed Project will comply with the 2020 Energy Conservation Construction Code of New York State and 2020 New York City Energy Conservation Code, which govern performance requirements of heating, ventilation, and air conditioning systems, as well as the exterior building envelope of new buildings. As a result, the Proposed Project will generate emissions below the Local Law 97 requirements and will contribute towards the NYC GHG reduction goals.

Since the Development Site is located within the 0.2 percent annual chance floodplain, the potential effects of global climate change have been considered and are presented in **Appendix A: Waterfront Revitalization Program Consistency Assessment**. The assessment considers the effects of climate change on rising sea levels, storm surge, and coastal flooding resulting from the Proposed Actions. As detailed in the Appendix, it was determined that the Proposed Project would be supportive of Policy 6.2 of the New York City Waterfront Revitalization Program (WRP). Therefore, adverse impacts to climate change are not anticipated as a result of the Proposed Actions.

Pollutants of Concern

GHGs are those gaseous constituents of the atmosphere, both natural and anthropogenic, that absorb and emit radiation at specific wavelengths within the spectrum of infrared radiation emitted by the Earth's surface, the atmosphere, and clouds. This property causes the general warming of the Earth's atmosphere, or the "greenhouse effect." Some GHGs, such as carbon dioxide (CO_2), occur both naturally and are emitted into the atmosphere through human activities. The *CEQR Technical Manual* lists six GHGs that could potentially be included in the scope of an environmental impact assessment: CO_2, nitrous oxide (N_2O), methane (CH_4), Hydrofluorocarbons (HFCs), Perfluorocarbons (PFCs), and Sulfur Hexafluoride (SF_6).

GHGs differ in their ability to trap heat. To compare emissions of GHGs, compilers use a weighting factor called a Global Warming Potential (GWP), where the heat-trapping ability of 1 metric ton (1,000 kilograms) of CO_2 is taken as the standard, and emissions are expressed in terms of CO_2 equivalents (CO_2e), but can also be expressed in terms of carbon equivalents. The GHGs which are emitted as a result of human activities and their GWPs are presented in **Table 15-1**.

Table 15-1 Global Warming Potential for Primary Greenhouse Gases

Greenhouse Gas	Common Sources	Global Warming Potential
CO_2 - Carbon Dioxide	Fossil fuel combustion, forest clearing, cement production	1
CH_4 - Methane	Landfills, production and distribution of natural gas and petroleum, anaerobic digestion, rice cultivation, fossil fuel combustion	21
N_2O - Nitrous Oxide	Fossil fuel combustion, fertilizers, nylon production, manure	310
HFCs - Hydrofluorocarbons	Refrigeration gases, aluminum smelting, semiconductor manufacturing	140–11,700
PFCs - Perfluorocarbons	Aluminum production, semiconductor manufacturing	6,500–9,200
SF_6 - Sulfur Hexafluoride	Electrical transmissions and distribution systems, circuit breakers, magnesium production	23,900

- Carbon Dioxide (CO_2). CO_2 enters the atmosphere via the combustion of fossil fuels (oil, natural gas, and coal), solid waste, trees and wood products, and also as a result of other chemical reactions (e.g., manufacture of cement). CO_2 is also removed from the atmosphere (or "sequestered") when it is absorbed by plants as part of the biological carbon cycle. Although not the GHG with the strongest effect per molecule, CO_2 is by far the most abundant and, therefore, the most influential GHG.
- Methane (CH_4). CH_4 is emitted during the production and transport of coal, natural gas, and oil. Methane emissions also result from livestock and other agricultural practices, as well as by the decay of organic waste in municipal solid waste landfills. Methane, in addition to nitrous oxide (noted below), plays an important role in GHG emissions since the removal processes for these compounds are limited and they have a relatively high impact on global climate change as compared to an equal quantity of CO_2 as reflected in their high global warming potential.
- Nitrous Oxide (N_2O). N_2O is emitted during agricultural and industrial activities, as well as during the combustion of fossil fuels and solid waste.
- Fluorinated Gases. Hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride are powerful synthetic greenhouse gases that are emitted from a variety of industrial processes. Fluorinated gases are sometimes used as substitutes for ozone-depleting substances (e.g., chlorofluorocarbons [CFCs], hydrochlorofluorocarbons [HCFCs], and halons). These gases are typically emitted in smaller quantities. However, because they are potent greenhouse gases, they are sometimes referred to as High Global Warming Potential gases (High GWP gases).

This analysis focuses on CO_2, N_2O, and CH_4 (collectively as CO_2e) as there are no significant direct or indirect sources of HFCs, PFCs, or SF_6 associated with the Proposed Actions.

Because of the growing consensus that GHG emissions resulting from human activity have 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 that address energy consumption and production, land use, and other areas. Although the U.S. has not ratified the international agreements that set emissions targets for GHGs, in December 2015, the U.S. signed the international Paris Agreement[1], which pledged deep cuts in emissions and has a stated goal of reducing annual emissions to a level that, by 2025, would be between 26 and 28 percent lower than 2005 emissions.[2]

Regardless of the Paris Agreement, the U.S. Environmental Protection Agency (EPA) is required to regulate GHGs under the Clean Air Act and has begun preparing and implementing regulations. In coordination with the National Highway Traffic Safety Administration (NHTSA), EPA currently regulates GHG emissions from newly manufactured on-road vehicles. In addition, EPA regulates transportation fuels via the Renewable Fuel Standard program, which will phase in a requirement for the inclusion of renewable fuels, increasing annually up to 36.0 billion gallons in 2022. In 2015, EPA also finalized rules to address GHG emissions from both new and existing power plants that would, for the first time, set national limits on the amount of carbon pollution that power plants can emit. The Clean Power Plan sets carbon pollution emissions guidelines and performance standards for existing, new, and modified and reconstructed electric utility generating units. On February 9, 2016, the Supreme Court stayed implementation of the Clean Power Plan pending judicial review. On March 28, 2017, the President of the U.S. signed an executive order directing the EPA to review the Clean Power Plan, and, in May 2019, the EPA administrator announced plans to change the way the EPA calculates health risks of air pollution, known as the Affordable Clean Energy Rule.

There are also regional and local efforts to reduce GHG emissions. In 2009, then New York State Governor David Paterson issued Executive Order No. 24, establishing a goal of reducing GHG emissions in New York State by 80 percent, compared with 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; an interim draft plan has been published.[3] The State is now seeking to achieve some of the emission reduction goals via local and regional planning and projects and though its Cleaner Greener Communities and Climate Smart Communities programs. The State also has adopted California's GHG vehicle standards (which are at least as strict as the federal standards).

The New York State Energy Plan outlines the State's energy goals and provides strategies and recommendations for meeting them. The latest version of the plan was published in June 2015. The new plan outlines a vision for transforming the state's energy sector that would result in increased energy efficiency (both demand and supply), increased carbon-free power production, and cleaner transportation in addition to achieving other goals not related to GHG emissions. The 2015 plan also establishes new targets: (1) reducing GHG emissions in New York State by 40 percent, compared with 1990 levels, by 2030; (2) providing 50 percent of electricity generation in the state from renewable sources by 2030;

[1] Conference of the Parties, 21st Session. *Adoption of The Paris Agreement, decision -/CP.21*. Paris, December 12, 2015.

[2] Unites States of America. *Intended Nationally Determined Contributions (INDCs)* as submitted. March 31, 2015.

[3] New York State Climate Action Council. New York State Climate Action Plan Interim Report. November 2010.

and (3) increasing building energy efficiency gains by 600 trillion British thermal units (Btu) by 2030.

To meet its commitment to the Regional Greenhouse Gas Initiative (RGGI), New York State has also developed regulations to cap and reduce CO_2 emissions from power plants. Under the RGGI agreement, the governors of nine northeastern and Mid-Atlantic states have committed to regulate the amount of CO_2 that power plants are allowed to emit, gradually reducing annual emissions to half the 2009 levels by 2020. The 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™ 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's long-term comprehensive plan for a sustainable and resilient New York City, which began as PlaNYC 2030 in 2007, and continues to evolve today as OneNYC, includes GHG emissions reduction goals, many specific initiatives that can result in emission reductions, and initiatives aimed at adapting to future climate change impacts. The goal to reduce citywide GHG emissions to 30 percent below 2005 levels by 2030 ("30 by 30") was codified by Local Law 22 of 2008, known as the New York City Climate Protection Act (the "GHG reduction goal").[4] The City also has announced a longer-term goal of reducing emissions to 80 percent below 2005 levels by 2050 ("80 by 50"), which was codified by Local Law 66 of 2014, and has published a study evaluating the potential for achieving that goal. More recently, as part of OneNYC, the City has announced a more aggressive goal for reducing emissions from building energy down to 30 percent below 2005 levels by 2025.

In December 2009, the New York City Council enacted four laws addressing energy efficiency in large 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 and retro-commissioning 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 also will 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 Conservation Code, which along with the Energy Conservation Construction Code of New York State (as updated in 2016), requires equipment installed during a renovation to meet current efficiency standards.

To achieve the 80 by 50 goal, the City is convening Technical Working Groups to analyze the GHG reduction pathways from the building, power, transportation, and solid waste sectors to develop action plans for these sectors. The members of the Technical Working Groups will develop and recommend the data analysis, interim metrics and indicators, voluntary actions, and potential mandates to effectively achieve the City's emissions reduction goal. In 2016, the City published the building sector Technical Working Group report, which included

[4] Administrative Code of the City of New York, §24-803.

commitments by the City to change building energy codes and take other measures aimed at substantially reducing GHG emissions.

For certain projects subject to CEQR (e.g., projects with 350,000 gsf or more of development or other energy intense projects), an analysis of the projects' contributions to GHG emissions is required to determine consistency with the City's reduction goal, which is currently the most appropriate standard by which to analyze a project under CEQR and is therefore applied in this chapter.

A number of benchmarks for energy efficiency and green building design have also been developed. For example, the 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.

Climate Change Initiatives

There are also several local initiatives related to assessing the potential local impacts to global climate change and development strategies to make existing and proposed infrastructure and development more resilient to the effects of climate change.

One such initiative is the Climate Change Adaptation Task Force that the City launched in 2008. The Task Force was charged with developing strategies to secure the City's critical infrastructure against the potential threats introduced by the climate changes such as rising sea levels and temperatures and changing precipitation patterns. It is composed of 40 City, State, and federal agencies, public authorities, and private companies that are involved in the operations of maintaining and regulating critical infrastructure in New York City. At least 100 types of infrastructure were identified that would be vulnerable to the impacts of climate chance and this inventory will help the Task Force develop coordinated strategies to increase the resilience of the region's infrastructure.

The City convened the New York City Panel on Climate Change (NPCC) composed of academic, policy advisors, and agencies to develop climate change projections of New York City. The 2009 *Climate Risk Information* report was prepared by the NPCC as part of PlaNYC to advice the Mayor and the Task Force on issue related to potential impacts on infrastructure due to climate change including, temperature, precipitation, rising sea levels, and extreme weather events. The NPCC developed projections using the Intergovernmental Panel on Climate Change (IPCC)-based methods to generate model-based probabilities for temperature, precipitation, sea level rise, and extreme events including coastal flooding in the 1 percent annual chance floodplain for the 2020s to the 2080s. These projections were developed using 16 global climate model (GCM) simulations and three GHGH emission scenarios. The NPCC released *Climate Change Adaptation in New York City: Building a Risk Management Response* in 2010 to serve as a basis for climate change adaptation in the City. In June 2013, the NPCC published *Climate Risk Information 2013: Observations, Climate Change Projections, and Maps* which outlines the most recent NPCC future climate projections. The NPCC regularly assesses climate change projections and updates those

projections regularly. The resulting reports serve as a guide in the City's policymaking process.

The City established an interagency group to work with the Federal Emergency Management Agency (FEMA) to revise the Flood Insurance Rate Maps (FIRMs) for the City, which set the base flood elevations for development on the floodplain and triggers the City's building code flood protection requirements. Currently, the FIRMs are undergoing revision to reflect changes in coastal shorelines and elevation, but the city's Building Code requirements will continue to reflect the 2015 Preliminary FIRMs.

There are also several plans to prepare the City for extreme climate events outlined in the: Natural Hazard Mitigation Plan, Coastal Storm Plan, Heat Emergency Plan, Debris Management Plan, Power Disruption Plan, Winter Weather Emergency Plan, and Flash Flood Emergency Plan. The Natural Hazard Mitigation Plan will be integrated with climate projections and include climate change as a hazard.

The New York City Department of Environmental Protection (DEP) also issued several plans aimed at evaluating and implementing adaptive strategies for infrastructure. These include the New York City Green Infrastructure Plan and Sustainable Stormwater Management Plan. In 2013, DEP released the NYC Wastewater Resiliency Plan that identifies wastewater treatment plants and pumping stations vulnerable to flooding, estimates potential coasts of future damages, and recommends protective measures such as waterproofing or elevation critical equipment out of flood elevations to reduce the risk of damage and loss of services.

The Department of City Planning (DCP) developed the WRP which serves as the City's principal coastal management tool and established the City's policies for development and use on the waterfront. It requires that proposed developments in the 1 percent annual change floodplain meet the goals set forth in the policies outlined in WRP, including Policy 6, where a development would need to assess current and future sea-level rise and flooding scenarios and implement flood resiliency measures.

DCP also published the Zoning for Coastal Flood Resiliency (ZCFR), a series of zoning changes for developments on the floodplain. ZCFR expands the geography where optional zoning rules apply to include the 0.2 percent annual chance floodplain, allows optional flexibility to adjust the building envelope from a reference plane, allows certain exemptions in floor area, introduces flexibility for existing non-compliant and/or non-conforming buildings to be retrofitted or reconstructed to meet or exceed flood-resistant construction standards, and permitted obstruction rules for buildings to elevate mechanical, electrical and plumbing equipment, among other modifications and provisions.

Methodology

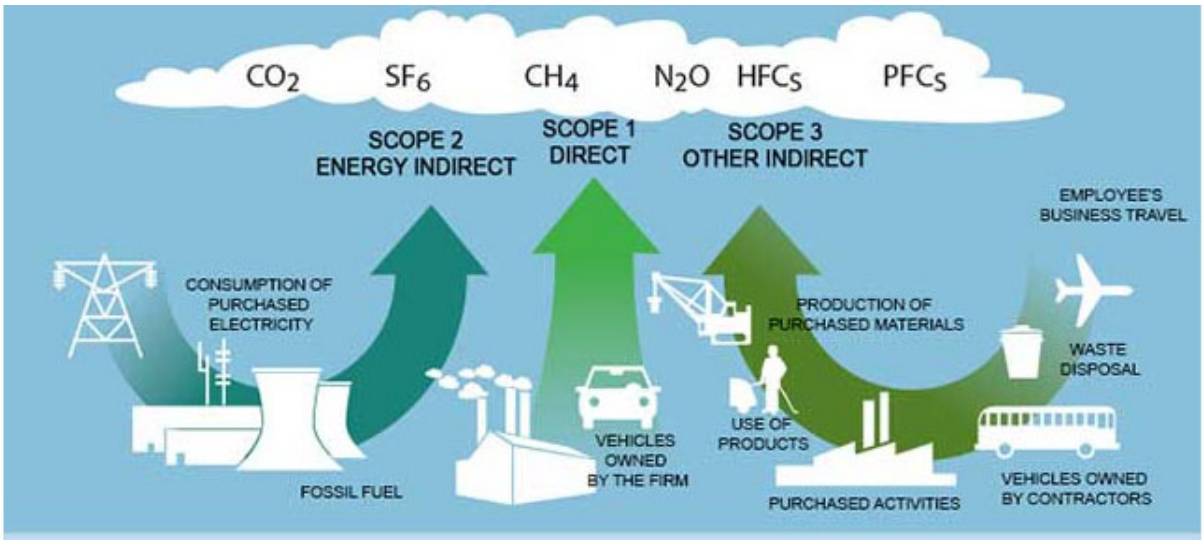
GHG Emissions Assessment

According to the *CEQR Technical Manual*, a GHG emissions assessment is typically conducted for larger projects undergoing an environmental impact statement, especially projects that would result in development of 350,000 square feet or greater. The Proposed Actions would result in the total development of approximately 2,200,538 gsf on the Development Site of which approximately 1,857,294 gsf would include residential,

commercial, and community facility uses. This latter amount was used in the GHG emissions assessment.

GHG emissions are generally divided into three types, three scopes, as illustrated in **Figure 15-1**.

Figure 15-1 Three Scopes of GHG Emissions



Source: http://synergyfiles.com/2017/04/scope-ghg-emissions/

Scope 1, or direct emissions, are emissions resulting from the fossil fuel combustion by the proposed buildings or by vehicles owned or operated by the proposed building management. Emissions from heating, ventilation, and air conditioning (HVAC) systems are the most typical source of GHG emissions for new building projects in New York City. Scope 2, or indirect emissions, are emissions from the generation of purchased electricity used by the buildings. Scope 3 are all other GHG emissions, including emissions from the vehicular trips generated by the proposed building, like employees' commute.

A project's GHG emissions under CEQR are assessed in two steps: first, GHG emissions of the proposed action are estimated, and second, the proposed action is assessed in comparison with the City goals for reducing GHG emissions. The *CEQR Technical Manual* recommends that the project's emissions be estimated with respect to the following main emissions sources: on-site operational emissions (direct and indirect); mobile source emissions (direct and indirect); and, when applicable, construction emissions and emissions from solid waste management. Pursuant to *CEQR Technical Manual* methodology, the assessment is based on the GHG emissions associated with the Proposed Actions.

Operational and mobile source emissions were quantified for this analysis. Emissions associated with construction are described qualitatively. The Proposed Project is not expected to fundamentally change the City's solid waste management system, therefore, no estimate of emissions from solid waste management is warranted.

Climate Change Assessment

According to the *CEQR Technical Manual*, an analysis of consistency with Policy 6.2 of the WRP may provide sufficient information to access the potential effects of sea-level rise, storm surge, and coastal flooding.

Assessment

Direct GHG Emissions

Operational GHG emissions would be generated by the Proposed Project's HVAC systems. The Proposed Project is not planning to own or operate any vehicles. Direct emissions from the operation of the natural gas-fired boilers of HVAC systems in the Proposed Project would result in a total of 4,891 metric ~~ton~~tons of CO_2e annually as shown in **Table 15-2**. However, it should be noted that natural gas-fired boilers are assumed for conservative analysis purposes only as the Applicant intends to utilize non-fossil fuel options for heating and cooling.

Table 15-2 GHG Emissions from Natural Gas-Fired HVAC Systems

		Unit
HVAC Energy Use Intensity	49.5	kBtu/gsf
***2021 CEQR TM* CO_2e Carbon Conversion Factor**	53.196	kg CO_2e/MMBtu
HVAC CO_2e	4,890,630	kg CO_2e
	4,891	MT CO_2e

Indirect GHG Emissions

Indirect GHG emissions would be generated to produce electricity for the Proposed Project. Electricity consumption is consistent with a DOAS HVAC systems. Estimates of the GHG emissions from the electricity are presented in **Table 15-3**. A total of 2,792 metric tons of CO_2e per year would be generated to satisfy the Proposed Project's annual consumption.

Table 15-3 GHG Emissions from Electricity Generation

		Unit
Building Electricity Use Intensity	12.28	kWhr/gsf
***2021 CEQR TM* CO_2e Carbon Conversion Factor**	35.902	kg CO_2e/MMBtu
Electricity CO_2e	2,791,835	kg CO_2e
	2,792	MT CO_2e

Mobile Source Emissions

The number of annual vehicle trips by mode (cars, taxis, and trucks) that would be generated by the Proposed Actions was calculated using the transportation planning assumptions

developed for the traffic analysis and presented in **Chapter 13, Transportation**. The number of project-generated trips by autos, taxis and trucks was obtained from the transportation analysis. Annual VMT was estimated based on the weekday trips and the average one-way distances as shown in Table 18-6 and Table 18-7 of the *CEQR Technical Manual*. The average truck trip was assumed to be 38 miles as per the *CEQR Technical Manual*. Tables 18-6 and 18-7 of the *CEQR Technical Manual* were used to determine the one-way trip distances for personal and taxi trips in Brooklyn and the mobile GHG emissions calculator provided in the *CEQR Technical Manual* was used to obtain an estimate of auto, taxi, and truck CO_2e emissions attributable to the Proposed Actions. The resultant GHG emissions are presented in **Table 15-4**. The total CO_2e emissions from the mobile sources attributable to the Proposed Action would be 8,110 metric tons annually.

Table 15-4 GHG Emissions from Mobile Sources

Vehicle Type	Annual VMT generated	Annual CO_2e [MT]
Auto	12,877,584	4,943
Taxi	172,099	59
Truck	1,913,946	3,108
Total	14,963,629	8,110

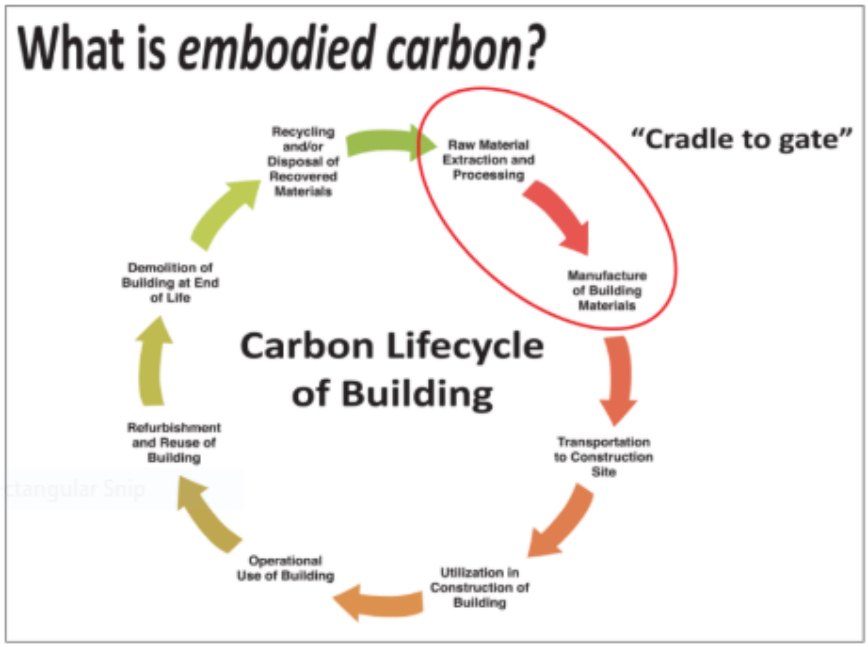
Note: All trips were assumed on arterial roadways in Brooklyn

Construction Emissions

Construction of the Proposed Project would comply with the New York City Air Pollution Control Code, the latest version of which was adopted on May 12, 2020. As per *CEQR Technical Manual* guidance, emissions associated with construction of the Proposed Project have been assessed qualitatively. Typical construction emissions and emissions of embodied carbon (see **Figure 15-2**) can account for about 5 to 10 years of building operational GHG emissions, i.e., approximately from 38,412 to 76,825 MT of CO_2e. The actual amount of CO_2e could change depending on the efficiency of building operations and efficiency and use of sustainable practices during construction.

Construction of the Proposed Project would follow New York City regulations and codes for construction that require the use of recycled materials, reduced diesel emissions, limited idle time for vehicles and equipment on-site, and other measures to reduce carbon emissions. In addition, following these practices would contribute to the overall goal of reducing GHG emissions from construction.

Figure 15-2 Embodied Carbon of a Building



Source: NE Sustainable Energy Association

Thus, construction of the Proposed Project would adhere to the City goals to reduce GHG.

Consistency with the GHG Reduction Goals

According to the *CEQR Technical Manual*, the assessment of consistency with the City GHG reduction goals should answer the following question: Is the project consistent with the goal of reducing GHG emissions, specifically the attainment of the City's established goal of reducing Citywide GHG emissions by 80 percent below 2005 levels by 2050? The other more immediate goal is to meet the requirements of the Local Law 97, Climate Mobilization Act. This Act requires that all newly constructed New York buildings larger than 25,000 square feet become more efficient and reduce their GHG under a certain level depending on the building size. **Table 15-5** presents the Local Law 97 carbon intensity rates by the future year that include the residential and community facility square footages of the largest development – Building 4 – proposed on the Development Site.

Table 15-5 GHG Limits of the Proposed Project's Largest Building

	2030-2034	
Land Use	**Carbon Intensity Rate Kg of CO2e/sq ft**	**Total Operational CO2e Emission Limit in MT**
Residential	4.07	1,035
Institutional	5.98	74
	Total	**1,108**

Building 4: Total Development = 266,530 gsf; Residential = 254,210 gsf; Institutional (community facility) = 12,320 gsf [excludes parking]

The total direct and indirect operational emissions estimated using the *CEQR Technical Manual* CO_2e conversion factors of the largest development would be 1,102 metric tons. This is below the Local Law 97 limit for the years 2030-2034. Operational emissions would be even lower if the more recent CO_2e conversion factors were used for NYC electricity and natural gas. The estimate based on the 2017 NYC GHG Inventory showed that the total operational GHG emissions for the largest building of the Proposed Project could be approximately 164 metric tons lower than emissions calculated from the *2021 CEQR Technical Manual* factors.

The overall GHG emissions from the Proposed Project constitute approximately 0.03 percent of the 2019 NYC annual GHG emissions of 55.1 million metric tons (MMT) of CO_2e.

In addition, the *2021 CEQR Technical Manual* outlines four major goals towards the GHG reduction:

- Construct new resource- and energy-efficient buildings (including the use of sustainable construction materials and practices) and improve the efficiency of existing buildings; and,
- Encourage sustainable transportation through improving public transit, improving the efficiency of private vehicles, and decreasing the carbon intensity of fuels.

The Proposed Project is consistent with some of these goals, as follows:

- The Proposed Actions would allow increases in residential and commercial density in the Development Site and would expand community amenities through the construction of the Performing Arts Center and trade school, while also providing community facilities such as a childcare facility.
- The Proposed Project would be built in accordance with the latest NYS and NYC codes, including the 2020 Energy Conservation Construction Codes of New York State (ECCNYS) and 2020 New York City Energy Conservation Code (NYCECC)—both of which govern building efficiency in the choice of HVAC system and the exterior building envelope.

Accordingly, the Proposed Project would be in compliance with the NYC GHG reduction goals for large buildings and would contribute towards the goal of reducing Citywide GHG emissions by 40 percent by 2030 and 80 percent by 2050 compared to 2005 levels.

Resilience to Climate Change

As discussed in **Appendix A: Waterfront Revitalization Program Consistency Assessment**, the Development Site is located within the City's Coastal Zone, specifically the northern portion of the Development Site boundary abuts the 0.2 percent annual chance minimal flood hazard area also known as the 500-year floodplain. Based on current projections, the Development Site is not projected to enter the 1 percent annual chance floodplain until the 2080s.

Because the Development Site would be constructed in the 0.2 percent annual floodplain, the potential effects of climate change as it relates to current and future sea-level rise scenarios are considered in this assessment. According to the *CEQR Technical Manual*, an analysis of consistency with Policy 6.2 of the WRP may provide sufficient information to access the potential effects of sea-level rise, storm surge, and coastal flooding. Policy 6.2

identifies three basic steps to determine the consistency of a project with this policy: (1) identify vulnerabilities and consequences; (2) identify adaptive strategies; and (3) assess policy consistency.

Building features are defined in one of four categories: (1) vulnerable: project features that have the potential to incur significant damage if flooded; (2) critical: project features that if damaged would have severe impacts on the project and its ability to function as designed; (3) potentially hazardous: project features that if damaged or made unsecure by flooding could potentially adversely affect the health and safety of the public and the environment; and (4) other: project features that are entirely open and unenclosed spaces, except the open storage of potentially hazardous materials, which may be damaged by flooding, but are not likely to present significant consequences and are more easily repaired. These features are assessed against sea level rise and Mean Higher High Water (MHHW) projections ranging from low to high estimates produced by the NPCC. Adaptive strategies to mitigate the impacts of sea-level rise and flooding on vulnerable and critical features and additional measures taken to protect the project from additional coastal hazards such as waves, high winds, or debris are discussed.

As detailed in **Appendix A**, the Proposed Actions would promote Policy 6.2. The Proposed Project would not result in development of any vulnerable, critical, or potentially hazardous features, within areas exposed to 1 percent annual chance flooding or MHHW by the 2050s under the 90th percentile projections.