PARK AVENUE BROOKLYN REZONING
Chapter 10: Greenhouse Gas Emissions and Climate Change

A. INTRODUCTION

This chapter considers the potential for the Proposed Actions to result in effects on greenhouse gas (GHG) emissions and climate change. As noted in the 2025 *City Environmental Quality Review (CEQR) Technical Manual*, increased concentrations of greenhouse gases (GHGs) are changing the global climate, resulting in wide-ranging effects on the environment, including rising sea levels, increases in temperature, and changes in precipitation levels. Although the contribution of a 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, certain projects' contribution of GHG emissions still should be analyzed to determine their consistency with the City's Citywide 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 that may result in inconsistencies with the GHG reduction goal to a degree considered significant. The 2025 *CEQR Technical Manual* recommends that a GHG consistency assessment be conducted for any project involving 350,000 square feet (sf) or more of development, and other energy-intense projects.

As described in **Chapter 1, "Project Description,"** the Proposed Actions would facilitate the redevelopment of nine Applicant-controlled Projected Development Sites and three non-Applicant-controlled Projected Development Sites. For CEQR analysis purposes, the Applicant's nine development sites and three non-Applicant sites are considered collectively and referred to as the total RWCDS for the Proposed Actions. Overall, the RWCDS for the Proposed Actions would result in a total of 483 dwelling units (DUs), including 124 affordable units pursuant to the Applicant's proposed Mandatory Inclusionary Housing (MIH) Option 1, 244,088 gross square feet (gsf) of private school space, 80,155 gsf of local retail space, 11,590 gsf of medical office space, and 151 accessory parking spaces (the With-Action condition) on the 12 Projected Development Sites.[1] Therefore, a GHG consistency assessment is warranted, and the GHG emissions that would be generated by the Proposed Actions are presented in this chapter, along with an assessment of the Proposed Actions' consistency with the Citywide GHG reduction goal.

Based on the Federal Emergency Management Agency (FEMA) Preliminary Flood Insurance Rate Maps (FIRMs) issued in January 2015, the Project Area is not currently located within the 100-year or 500-year flood zone, however, it is located within the 2050s and 2080s 100- and 500-year projections. Therefore, a qualitative discussion of the potential effects of climate change on future development in the Project Area is provided in accordance with 2025 *CEQR Technical Manual* guidance.

[1] Pursuant to CEQR guidance, the GHG assessment is based on the total GHG emissions associated with a project, rather than the relative increment of a project's GHG emissions as compared to a No-Action condition.

B. PRINCIPAL CONCLUSIONS

The Proposed Actions would not result in significant adverse impacts related to GHG emissions and climate change as they would be consistent with the City's GHG emissions reduction goals and laws, as defined in the 2025 *CEQR Technical Manual*.

It is estimated that the RWCDS associated with the Proposed Actions would result in approximately 7,200 metric tons of carbon dioxide equivalent (CO_2e) of annual emissions from building operations and approximately 4,512 metric tons of CO_2e emissions from mobile sources annually, for an annual total of approximately 11,712 metric tons of CO_2e emissions. This represents approximately 0.02 percent of New York City's 2023 annual total GHG emissions of 51.22 million metric tons. It should be noted that the estimated GHG emissions for the RWCDS under the Proposed Actions conservatively do not account for any energy efficiency measures that may be implemented and that go beyond the minimum requirements.

The Proposed Actions would advance New York City's GHG reduction goals by virtue of their nature and location. The new buildings facilitated by the Proposed Actions, which would replace existing structures or vacant lots, would be subject to the New York City Energy Conservation Code (NYCECC), which governs performance requirements of heating, ventilation, and air conditioning systems, as well as the exterior building envelope of new buildings. In compliance with this code, new development resulting from the Proposed Actions must meet standards for energy efficiency. Additionally, the Project Area is in an area supported by many transit options. By facilitating the development of new mixed-income housing alongside new private schools and local retail space in a transit and pedestrian oriented urban area, the Proposed Actions are consistent with the City's goal of reducing GHG emissions through transit-oriented development. Therefore, the Proposed Actions would be consistent with the City's applicable emissions reduction goals of transit-oriented development and construction of new resource- and energy-efficient buildings.

The Project Area is not located within the currently applicable 100-year and 500-year floodplains, although a small portion of the Project Area is anticipated to fall within the future projected 500-year floodplain (but not within the future projected 100-year floodplain) by the 2050s, and a small portion of the Project Area is anticipated to fall within the future projected 100-year flood zone by the 2080s. None of the Projected Development Sites would be located on a waterfront site (the Project Area is located more than 0.7 mile away from the nearest water body, Wallabout Bay/Channel), and are therefore not susceptible to flooding risk from storm surge and coastal flooding, and would continue to be so in the future according to projections by the New York City Panel on Climate Change (NPCC). As noted above, future developments in the Project Area would be constructed to meet the codes and any related resiliency requirements in effect at the time of construction.

C. RECOGNIZED GREENHOUSE GASES

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. The general warming of the Earth's atmosphere caused by this phenomenon is known as the "greenhouse effect." The 2025 *CEQR Technical Manual* lists six internationally recognized GHGs regulated under the Kyoto Protocol that could potentially be included in the scope of a GHG analysis for an Environmental Impact Statement (EIS): carbon dioxide (CO_2), nitrous oxide (N_2O), methane (CH_4), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulfur hexafluoride (SF_6). This analysis focuses primarily

on CO_2, N_2O, and methane. There are no significant direct or indirect sources of HFCs, PFCs, or SF_6 associated with the Proposed Actions.

CO_2 is the primary pollutant of concern from anthropogenic sources. Although not the GHG with the strongest effect per molecule, CO_2 is by far the most abundant and, therefore, the most influential GHG. CO_2 is emitted from any combustion process (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 (or "sequestered") from the lower atmosphere by natural processes such as photosynthesis and uptake by the oceans. CO_2 is included in any analysis of GHG emissions, consistent with 2025 *CEQR Technical Manual* guidance. Methane (CH_4) and Nitrous oxide (N_2O) also play an important role since the removal processes for these compounds are limited and because they have a relatively high impact on global climate change as compared with an equal quantity of CO_2. Emissions of these compounds are therefore included in GHG emissions analyses when the potential for substantial emission of these gases exists.

GHGs differ in their ability to trap heat in the atmosphere. To present a complete inventory of all GHGs, component emissions are added together and presented as carbon dioxide equivalent (CO_2e) emissions — a unit representing the quantity of each GHG weighted by its effect 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). GWPs account for the lifetime and the radiative forcing of each chemical 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). Consistent with the 2025 *CEQR Technical Manual*, CO_2e emissions are estimated using the GWP over a 100-year horizon (GWP-100). While New York State GHG emission reduction goals use a 20-year horizon (GWP-20), the emissions of GHGs other than CO_2 represent a very minor component of the emissions associated with the Proposed Actions and the difference between the two GWPs would be negligible. The GWPs for the main GHGs discussed above are presented in **Table 10-1**.

TABLE 10-1
Global Warming Potential (GWP) for Primary Greenhouse Gases

Greenhouse Gas	Common sources	100-year Horizon GWP[1]	20-year Horizon GWP[2]
CO_2 – Carbon Dioxide	Fossil fuel combustion, forest clearing, cement production	1	1
CH_4 – Methane	Landfills, production and distribution of natural gas and petroleum, anaerobic digestion, rice cultivation, fossil fuel combustion	21	84
N_2O – Nitrous Oxide	Fossil fuel combustion, fertilizers, nylon production, manure	310	264
HFCs – Hydrofluorocarbons	Refrigeration gases, aluminum smelting, semiconductor manufacturing	140 to 11,700*	427-10,800*
PFCs – Perfluorocarbons	Aluminum production, semiconductor manufacturing	6,500 to 9,200*	4,800-8,210*
SF_6 – Sulfur Hexafluoride	Electrical transmissions and distribution systems, circuit breakers, magnesium production	23,900	17,500

Source: 2025 *CEQR Technical Manual*
Notes:
[1] The 100-year GWPs presented above are based on the Intergovernmental Panel on Climate Change's (IPCC) Second Assessment Report (SAR) to maintain consistency in GHG reporting. The IPCC has since published updated GWP values that reflect new information on atmospheric lifetimes of GHGs and an improved calculation of the radiative forcing of CO 2. In some instances, if combined emission factors were used from updated modeling tools, some slightly different GWP may have been used for this study. Since the emissions of GHGs other than CO2 represent a very minor component of the emissions, these differences are negligible.
[2] The 20-year GWPs presented above are consistent with New York State's approach to GHG emission estimates as described in the Climate Leadership and Community Protection Act.
* The GWPs of HFCs and PFCs vary depending on the specific compound emitted. A full list of these GWPs is available in Table ES-1 of the U.S. Environmental Protection Agency's Inventory of Greenhouse Gas Emissions and Sinks: 1990-2008, available at: https://www.epa.gov/ghgemissions/inventory-us-greenhouse-gas-emissions-and-sinks-1990-2008 (for 100-year horizon) and in Table 2 of the DEC 2023 Statewide GHG Emissions Report available at: https://www.dec.ny.gov/energy/99223.html#Report (for 20-year horizon).

D. POLICY, REGULATIONS, STANDARDS, AND BENCHMARKS FOR REDUCING GHG EMISSIONS

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 GHG emissions by implementing both global and local measures addressing energy consumption and production, land use, and other sectors. There are also regional and local efforts to reduce GHG emissions.

Federal Policies

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 that pledged deep cuts in GHG emissions, with a stated goal of reducing annual GHG emissions to levels that would be between 26 and 28 percent lower than 2005 levels by 2025. On January 20, 2025, President Biden signed an executive order to bring the U.S. back into the Paris Agreement after the U.S. officially withdrew from the agreement in November 2020. On January 20, 2025, President Trump signed an executive order directing U.S. withdrawal from the Paris Agreement again; this second withdrawal is in process and is anticipated to take effect in one year.

Regardless of the Paris Agreement, the United States 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 (RFS) program, which phased in requirements for the inclusion of renewable fuels that increased annually up to a total of 36.0 billion gallons by 2022. On December 1, 2022, EPA announced a proposed rule to establish the required fuel volumes and percentage standards for 2023, 2024, and 2025, as well as important modifications to strengthen and expand the RFS program. EPA issued the Affordable Clean Energy rule on June 19, 2019; the rule establishes GHG emissions reduction measures accepted as best technology for power plants and focuses on energy efficiency improvements in place of direct GHG emissions reduction measures.

New York State Climate Leadership and Community Protection Act

In 2019, New York State enacted the Climate Leadership and Community Protection Act (CLCPA), which became effective January 1, 2020. Among other requirements, the CLCPA Section 7(2) directs State agencies to determine if the decisions they make are consistent with the Statewide GHG emission reduction goals established by the CLCPA (ECL Article 75). Pursuant to ECL Article 75, the CLCPA requires a Statewide reduction in GHG emissions from 1990 levels of 40 percent by 2030 and 85 percent by 2050 (6 NYCRR Part 496). 6 NYCRR 494.4(b) establishes emission limits of 245.87 million metric tons of carbon dioxide equivalents (MT CO_2e) by 2030, and 61.47 million MT CO_2e by 2050. Furthermore, the CLCPA requires that the energy generation sector be zero-emissions by 2040. The legislation also charges the New York State Climate Action Council (CAC) with making recommendations to establish agency regulations to reduce GHG emissions and increase investments in renewable energy sources. The State must also ensure that significant portions of such investments are made in Disadvantaged Communities. To address Section 7(3) of the CLCPA, the State is required to prioritize the reduction of GHG emissions and co-pollutants in Disadvantaged Communities. As shown in **Figure 15-1**, the Project Area is located within and surrounded by census tracts that are designated as Disadvantaged Communities (refer to **Chapter 15** for assessment of effects on Disadvantaged Communities).

On December 19, 2022, the CAC approved a Scoping Plan for the CLCPA. The New York State fiscal year 2023-2024 budget focuses on, among other things, investment in energy affordability, sustainable buildings, and clean, renewable energy, consistent with the CLCPA cap-and-invest program to accelerate climate action and support the State's renewable targets. On December 29, 2022, New York State also announced the adoption of California's GHG vehicle standards, the Advanced Clean Cars II Rule, which are at least as strict as the federal standards and would require all new passenger cars and trucks sold in New York State to be zero-emissions by 2035.

New York City Initiatives

In 2019, the New York City Council enacted a legislative package targeting GHG emissions associated with building energy consumption — the Climate Mobilization Act (Local Law 97). For most buildings that exceed 25,000 gsf (excluding electricity/steam generation facilities, rent-regulated accommodations, places of public worship, and City-owned properties), the City has established annual building emission limits beginning in 2024 and would require the owner of a covered building to submit annual reports demonstrating the building is in compliance with the current GHG emission limits to reduce greenhouse gas emissions from buildings by 40% by 2030 and 80% by 2050. For buildings not covered under the GHG emissions limits, owners may either demonstrate compliance with the current limits or implement specified energy conservation measures where applicable.

In March 2020, the City enacted Local Law 48 of 2020, to bring the New York City Energy Conservation Code up to date with the 2020 Energy Conservation Construction Code of New York State (2020 ECCCNYS), which is based on the 2018 edition of the International Energy Conversation Code and ASHRAE Standard 90.1-2016 and aligns with the New York State Energy Research and Development Authority (NYSERDA) NYStretch Energy Code-2020. This new version of the Energy Conservation Code adopts the provisions of the 2020 ECCCNYS, aligns it with administrative provisions of the NYC Construction Codes, aligns with the provisions of the NYSERDA NYStretch Energy Code-2020, and adopts additional requirements. It is intended to ensure that the construction of new buildings, additions and alterations will meet the 80 percent greenhouse gas reduction by 2050.

In December 2025, the New York City Council enacted Local Law 154, intended to limit the use of fossil fuels in future building construction. This law requires expansion of electric alternatives for cooking, heating, and service hot water in replacement of those powered by natural gas and fuel oil. The law takes effect in phases; the first phase for smaller buildings (less than seven stories in height) took effect in January of 2024.

Other Benchmarks

Several benchmarks for energy efficiency and green building design have also been developed (green building design considerations include factors such as material selection, which affects GHG emissions associated with materials extraction, production, delivery, and disposal). For example, the LEED system is a benchmark for the design, construction, and operation of high-performance green buildings that includes energy efficiency components. Similarly, ENVISION is a voluntary system for benchmarking performance and resiliency of physical infrastructure projects. 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. The Waterfront Alliance has also developed Waterfront Edge Design Guidelines (WEDG®), a voluntary rating system and set of guidelines intended to create resilient, ecological, and accessible waterfronts**.**

E. METHODOLOGY

The 2025 *CEQR Technical Manual* recommends that a GHG consistency assessment be conducted for any project involving 350,000 sf or more of development, or other energy-intense projects. As described in **Chapter 1, "Project Description,"** approval of the Proposed Actions would facilitate the redevelopment of nine Applicant-controlled Projected Development Sites and three non-Applicant-controlled Projected Development Sites within the Project Area. Overall, the RWCDS for the Proposed Actions would result in a total of 483 DUs, including 124 affordable units pursuant to the Applicant's proposed MIH Option 1, 244,088 gsf of private school space, 80,155 gsf of local retail space, 11,590 gsf of medical office space, and 151 accessory parking spaces (the With-Action condition) on the 12 Projected Development Sites.

For RWCDS purposes, the Proposed Actions are also assumed to have the potential to result in development at two other non-Applicant-controlled sites (Block 1736, Lot 68 [Potential Development Site A] and Block 1735, portion of (p/o) Lot 59 [Potential Development Site B]), which are less likely to occur by the analysis year of 2030. In accordance with *CEQR Technical Manual* guidance, an analysis of GHG is not provided for the Potential Development Sites.

A project's GHG emissions can generally be assessed in two steps: the first would be to estimate the GHG emissions resulting from the Proposed Actions and the second would be to examine the Proposed Actions in terms of the qualitative goals for reducing GHG emissions, as defined in the *CEQR Technical Manual*. According to the *CEQR Technical Manual*, for projects where the proposed project would result in construction on sites that are not under the control of the applicant (such as a rezoning of multiple sites), a GHG emissions assessment of emissions associated with sites not controlled by the applicant is unlikely to be meaningful because promotion of the GHG reduction goal through improved efficiency of site-specific building systems and similar measures cannot be achieved within the scope of the project. Rather, *CEQR Technical Manual* guidance indicates that, in quantifying, disclosing, and discussing the GHG emissions resulting from this type of project, the lead agency should qualitatively discuss the benefits or drawbacks of the project in relation to the achievement of the City's GHG reduction goal through encouragement of mixed-use, sustainable transportation-oriented development and/or GHG emissions avoided in the City as a result of the project.

A project's GHG emissions are estimated with respect to the following main GHG 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. After these emissions sources are estimated, the sources of GHG emissions are examined in terms of goals for reducing GHG emissions using qualitative considerations. As defined in the 2025 *CEQR Technical Manual*, the qualitative goals that should be assessed, as relevant to the project are: (1) pursuing transit-oriented development; (2) generating clean, renewable power; (3) constructing new resource- and energy-efficient buildings and/or improving the efficiency of existing buildings; and (4) encouraging sustainable transportation.

Operational emissions and mobile source emissions were considered for this analysis. Pursuant to 2025 *CEQR Technical Manual* methodology, the assessment is based on the total GHG emissions associated with the RWCDS, rather than the relative increment of the RWCDS's GHG emissions as compared to the No-Action condition. As such, and given a substantial amount of the vehicle miles traveled by project-generated vehicles would still be traveled in the No-Action condition, this methodology substantially overstates the net incremental mobile source emissions generated by the Proposed Actions.

Given the lack of specific construction sequences and data for the Projected Development Sites, and as the construction phase under the Proposed Actions is unlikely to represent a significant part of total emissions resulting from the Proposed Actions, emissions associated with the construction phase under the Proposed Actions have been described qualitatively based on other similar analyses for building construction. Similarly, because the Proposed Actions would not fundamentally change the City's solid waste management system, an estimate of emissions from solid waste management is not warranted for the Proposed Actions.

Building Operational Emissions

According to the 2025 *CEQR Technical Manual*, for projects such as a proposed rezoning action, where the action would result in construction on sites that are not under the control of an applicant and where details such as the specific fuel type to be used are unknown, annual GHG emissions should be estimated based on a project's anticipated future floor area. Table 18-4 of the 2025 *CEQR Technical Manual* provides the carbon intensities of New York City building types, which were used to calculate annual operations emissions of the RWCDS associated with the Proposed Actions.

Mobile Source Emissions

The number of annual vehicle trips by mode (cars, taxis, and trucks) that would be generated by the RWCDS associated with the Proposed Actions was calculated using the transportation planning factors and assumptions developed for the traffic analysis and presented in **Chapter 10, "Transportation."** The factors and assumptions used in the calculation include average daily weekday and Saturday person trips and delivery trips by proposed land use, the percentage of vehicle trips by mode, and the average vehicle occupancy. To calculate annual totals, the number of trips on Sundays was assumed to be the same as on Saturdays. Average one-way trip distances as shown in Tables 18-5 and 18-6 of the 2025 *CEQR Technical Manual* were used in the calculations of annual vehicle miles traveled by cars and taxis. The average truck trip was assumed to be 38 miles as per the 2025 *CEQR Technical Manual*. Table 18-7 of the 2025 *CEQR Technical Manual* was used to determine the percentage of vehicle miles traveled by road type, and the mobile GHG emissions calculator provided in the 2025 *CEQR Technical Manual* was used to estimate GHG emissions from all trips attributable to the RWCDS. Since the mobile GHG emissions calculator does not assume an increased percentage of electric vehicles in the regional vehicle fleet, the GHG vehicle emissions would be less than shown herein as New York State implements new zero emission vehicle sale and lease requirements beginning in 2035.

The projected total annual vehicle miles traveled under the RWCDS for the Proposed Actions, forming the basis for the GHG emissions calculations from mobile sources, are summarized in **Table 10-2**. The mobile GHG emissions calculator was used to obtain an estimate of car, taxi, and truck GHG emissions attributable to the Proposed Actions.

TABLE 10-2
Proposed Actions' (RWCDS) Annual Vehicle Miles Traveled (miles per year)

Use	Passenger Vehicles	Taxis	Trucks	Total
Residential	1,583,273	0	327,142	1,910,415
Local Retail	3,617,429	0	289,561	3,906,990
Private Schools	204,624	248,859	1,120,734	1,574,217
Medical Office	158,796	56,318	41,610	256,724
Total Increase in VMT	**5,564,122**	**305,177**	**1,779,047**	**7,648,346**

Construction Emissions

Consistent with common CEQR practice, emissions associated with construction under the RWCDS have not been estimated explicitly for the Proposed Actions, but analyses prepared for development projects in New York City 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) would be equivalent to the total operational emissions from the operation of the buildings over approximately five to 10 years.[2]

Emissions from Solid Waste Management

The Proposed Actions would not change the City's solid waste management system. Therefore, pursuant to 2025 *CEQR Technical Manual* guidance, GHG emissions from solid waste

[2] Examples include GHG analyses prepared for the EISs for Riverside Center, the Domino Sugar Rezoning, and the Western Rail Yard.

generation, transportation, treatment, and disposal are not quantified herein and no further assessment is warranted for the Proposed Actions.

F. PROJECTED GHG EMISSIONS FROM THE PROPOSED ACTIONS

Building Operational Emissions

Table 10-3 displays the estimated GHG emissions associated with the operation emissions of the RWCDS for the Proposed Actions. As shown in **Table 10-3**, operational GHG emissions are estimated to be approximately 7,200 metric tons of CO_2e. This represents approximately 0.02 percent of New York City's 2023 annual total GHG emissions from stationary energy of 36.67 million metric tons.[3] It should be noted that the estimated GHG emissions for the RWCDS under the Proposed Actions conservatively do not account for any energy efficiency measures that may be implemented.

TABLE 10-3
Annual Building Operational Emissions – RWCDS

Building Type	CTM Carbon Intensity Rates [kg CO_2e/sf]	RWCDS Floor Area (sf)	GHG Emissions (kg)	GHG Emissions (metric tons)
Commercial	9.43	136,696	1,289,043	1,289
Industrial	23.18	0	0	0
Institutional	11.42	255,678	2,919,843	2,920
Large Residential (> 4 family)	6.59	453,813	2,990,628	2,991
Small Residential (1-4 family)	4.52	0	0	0
Total Operational GHG Emissions		**846,187**	**7,199,514**	**7,200**

Notes:
Commercial = Retail, Accessory Parking
Institutional = Private Schools, Medical Office
1 metric ton = 1,000 kg
See *CEQR Table 18-4*

Mobile Source Emissions

The number of annual motorized vehicle trips by mode (cars, taxis and trucks) that would be generated by the RWCDS under the Proposed Actions was calculated using the transportation planning factors and assumptions developed for the traffic analysis and presented in **Chapter 13, "Transportation."** The factors and assumptions used in the calculation include average daily weekday and Saturday person trips and delivery trips by proposed land use, the percentage of vehicle trips by mode, and the average vehicle occupancy. To calculate annual totals, the number of trips on Sundays was assumed to be the same as on Saturdays. As stated in Section E, "Methodology," above, annual vehicle miles traveled by cars, taxis, and trucks were calculated in accordance with 2025 *CEQR Technical Manual* guidance, and do not account for reductions in VMT by vehicles redirected from existing travels to travels associated with the RWCDS. As presented in **Table 10-2** above, it is estimated that the vehicle trips generated by the RWCDS under the Proposed Actions would travel a total of 7,648,346 miles annually; annual passenger

[3] City of New York Inventory of New York City Greenhouse Gas Emissions, Mayor's Office of Climate & Environmental Justice (https://climate.cityofnewyork.us/initiatives/nyc-greenhouse-gas-inventories/). Accessed December 2024. Stationary Energy refers to energy used by buildings and other stationary sources, as well as fugitive emissions from natural gas distribution within city limits.

vehicle miles would total 5,564,122, annual taxi vehicle miles would total 305,177, and annual truck trip miles would total 1,779,047.

The mobile GHG emissions calculator was used to obtain an estimate of car, taxi, and truck GHG emissions attributable to the Proposed Actions. As shown **Table 10-4**, annual mobile source emissions related to the RWCDS under the Proposed Actions would result in approximately 4,511.47 metric tons of CO_2e. This represents approximately 0.04 percent of New York City's 2023 annual total GHG emissions from transportation of 12.59 million metric tons.[4] As noted above, because the mobile GHG emissions calculator does not assume an increased percentage of electric vehicles in the regional vehicle fleet, the GHG vehicle emissions would be less than shown herein as New York State implements new zero emission vehicle sale and lease requirements beginning in 2035.

TABLE 10-4
Annual Mobile Source Emissions for 2031 – RWCDS

Carbon Dioxide Equivalent (CO_2e) Emissions (metric tons/year)				
Road Type	**Passenger Vehicles**	**Taxis**	**Trucks**	**Total**
Local	428.77	21.12	668.02	1,117.91
Arterial	835.50	41.01	1,169.99	2,046.51
Interstate/Expressway	561.28	27.08	758.69	1,347.05
Total	***1,825.55***	***89.21***	***2,596.70***	***4,511.47***

Summary

The total projected GHG emissions from the RWCDS under the Proposed Actions are shown in **Table 10-5**. As shown in **Table 10-5**, operational building energy emissions represent approximately 61 percent of total emissions; conversely, emissions associated with mobile sources represent approximately 39 percent of the total emissions.

TABLE 10-5
Summary of Total Annual GHG Emissions Under the Proposed Actions – RWCDS

Emissions Source	CO_2e Emissions (metric tons)
Operations	7,200
Mobile Sources	4,512
Total	***11,712***

The estimated total of 11,712 metric tons of GHG emissions shown in **Table 10-5** is approximately 0.02 percent of New York City's 2023 annual total GHG emissions of 51.22 million metric tons. As noted above, the estimated GHG emissions for the RWCDS under the Proposed Actions conservatively do not account for any energy efficiency measures that may be implemented, nor cleaner vehicle fleets in the future. As described in Section E, "Methodology," above, construction emissions were not modeled explicitly but are estimated to be equivalent to approximately five to 10 years of operational emissions, including both direct energy and emissions embedded in materials (extraction, production, and transport). The Proposed Actions would not change the City's solid waste management system, and therefore emissions associated with solid waste are not presented.

[4] City of New York Inventory of New York City Greenhouse Gas Emissions, Mayor's Office of Climate & Environmental Justice (https://climate.cityofnewyork.us/initiatives/nyc-greenhouse-gas-inventories/). Accessed December 2024. Transportation sources include on-road transportation, railways, marine navigation, and aviation within City limits.

Consistency with the GHG Reduction Goal

According to the 2025 *CEQR Technical Manual*, the assessment of consistency with the City's GHG reduction goal should answer the following question: "Is the project consistent with the goal of reducing GHG emissions, specifically the attainment of the City's established GHG reduction goal of reducing citywide GHG emissions by 30 percent below 2005 levels by 2030?" To determine consistency with the City's overall GHG reduction goal, the following assesses consistency with the four major goals as cited in the 2025 *CEQR Technical Manual*, as relevant to the project:

- Pursue transit-oriented development;
- Generate clean renewable power through replacement of inefficient power plants with state-of-the-art technology and expanding the use of clean distributed generation (not applicable in the case of the Proposed Actions);
- 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.

Elements of the RWCDS That Would Reduce GHG Emissions

In general, dense, mixed-use development with access to transit and existing roadways is consistent with sustainable land use planning and smart growth strategies to reduce the carbon footprint of new development. These features are discussed in this section, addressing the OneNYC 2050 goals as outlined in the 2025 *CEQR Technical Manual*. Following the approach defined in the 2025 *CEQR Technical Manual*, the Proposed Actions would result in development that is consistent with the City's emissions reduction goal as implemented to date, based on the City's commitments to energy efficiency and by virtue of the Project Area's location and nature.

Build Efficient Buildings

The Proposed Actions would facilitate the development of residential, schools, and mixed-use residential and retail development on previously developed urban land, thereby minimizing vegetation/forest loss. Furthermore, the Proposed Actions would facilitate the development on Projected Development Sites within the Project Area with existing urban infrastructure, including public sidewalks, transit, sewers, and water mains, thereby minimizing the need for extensive infrastructure development. The RWCDS facilitated under the Proposed Actions would be required at a minimum to achieve the energy efficiency requirements of New York City's 2020 ECCCNYS, discussed above, which is designed to ensure meeting the City's 80 percent by 2050 GHG reduction goal. Therefore, the Proposed Actions would support the goal identified in the 2025 *CEQR Technical Manual* of building efficient buildings.

Use Clean Power

The RWCDS facilitated under the Proposed Actions is likely to use electricity for the normal operation of the heat and hot water systems, thereby avoiding the on-site combustion of fossil fuel for building operations.

Transit-Oriented Development and Sustainable Transportation

The Project Area is located within a Transit Zone and is in an area supported by many transit options. The closet subway stations to the Project Area are the Flushing Avenue and Myrtle-Willoughby Avenues Stations which are served by the G train. These stations are approximately 0.5-mile from Projected Development Sites in the Project Area. The B44 and B44 SBS buses run northbound on Bedford Avenue and southbound on Nostrand Avenue and connect the neighborhood to Sheepshead Bay. The B54 bus runs east and west along Myrtle Avenue between Downtown Brooklyn and Ridgewood just south of the Project Area. The RWCDS facilitated under the Proposed Actions would also encourage sustainable transportation by providing bicycle parking in accordance with zoning requirements.

By facilitating the development of new mixed-income housing alongside new schools, local retail and community facility space in a transit and pedestrian oriented urban area, the Proposed Actions would substantially reduce carbon emissions as compared to development in car-dependent areas, where such development may occur. Research indicates that low-density suburban development is more energy and GHG intensive by a factor of 2.0–2.5 than high-density urban core development on a per capita basis.[5] Likewise, while approximately 17.6 percent of trips by residents as a result of the RWCDS would be made via auto or taxi (as indicated by Census data cited in **Chapter 13, "Transportation"**), approximately 68 percent of workers nationally commute to work by driving alone.[6] In contrast, the RWCDS facilitated by the Proposed Actions would generate significantly fewer private vehicle trips and VMT.

Reduce Construction Operation Emissions

Construction activities resulting from the Proposed Actions would comply with the New York City Air Pollution Control Code, which includes use of ultra-low sulfur diesel (ULSD) fuel and best available technology (BAT) as described in **Chapter 19, "Construction."** These measures would reduce particulate matter emissions; while particulate matter is not included in the list of standard GHGs ("Kyoto gases"), recent studies have shown that black carbon — a constituent of particulate matter — may play an important role in climate change.

Use Building Materials with Low Carbon Intensity

The Proposed Actions are an area-wide rezoning and none of the buildings expected to be constructed on the 12 Projected Development Sites have been fully designed yet. However, based on standard construction practices for buildings of similar size as those projected in the RWCDS, the building structures comprising the RWCDS developments on the Projected Development Sites would most likely be predominantly concrete, with some steel supports (rebar). Recycled steel would most likely be used for most structural steel rebar, since the steel available in the region is mostly recycled. The RWCDS developments would likely use some recycled materials for interiors, and may consider materials produced regionally, rapidly renewable materials, and materials that contain recycled content where appropriate. Construction waste would be diverted from landfills to the extent practicable by separating out materials for reuse and recycling.

[5] Norman, J.; Maclean, H.; & Kennedy, C. (2006). "Comparing High and Low Residential Density: Life-Cycle Analysis of Energy Use and Greenhouse Gas Emissions." Journal of Urban Planning and Development-asce - J URBAN PLAN DEV-ASCE.

[6] <https://www2.census.gov/programs-surveys/commuting/guidance/acs-1yr/Mean-drove-alone.pdf>

G. RESILIENCE TO CLIMATE CHANGE

The City is studying and preparing for the likely consequences of climate change Citywide. Federal, state, and local standards are still evolving to address and account for changing environmental conditions and it is anticipated that the City's infrastructure design criteria, building codes, and other laws and regulations will be further updated to incorporate measures related to a project's resilience to climate change. According to the 2025 *CEQR Technical Manual*, although significant climate change impacts are unlikely to occur in the analysis year for most projects, depending on a project's sensitivity, location, and useful life, it may be appropriate to provide a qualitative discussion of the potential effects of climate change on a proposed project in environmental review.

Although the typical lifespan of residential buildings is 80 years or more, the RWCDS buildings (comprised of mixed-use residential and commercial, mixed-use residential, commercial, and community facility, and community facility buildings) would be assumed to have a lifespan of 70 years. While mechanical, electrical, and plumbing equipment located within such buildings typically have a lifespan of 50 years, the location of equipment and connections does not generally change over time. The New York City Panel on Climate Change (NPCC) projected that sea levels are likely to increase by up to 30 inches by the 2050s, up to 58 inches by the 2080s, and up to 75 inches by 2100 under the "High Scenario."[7] As discussed in **Chapter 2, "Land Use, Zoning, and Public Policy,"** the Project Area is not located within the currently applicable one percent or 0.2 percent annual-chance (a.k.a. 100-year and 500-year, respectively) floodplains; however, a small portion of the Project Area is anticipated to fall within the future projected 500-year floodplain by the 2050s, and a small portion of the Project Area is anticipated to fall within the future projected 100-year flood zone by the 2080s. (Note that these flood areas and elevations are likely conservatively high, and may be revised in the future.) Therefore, as portions of the Project Area would be partly located within the projected potential future 100-year and 500-year floodplains within the lifetime of the RWCDS buildings, the potential effects of global climate change on the Projected Development Sites are considered qualitatively.

As stated in the 2025 *CEQR Technical Manual*, an analysis of consistency with Policy 6.2 of the WRP may provide sufficient information to assess the potential effects of sea level rise, storm surge, and coastal sea flooding. Policy 6.2 of the WRP states that consideration of the latest New York City projections of climate change and sea level rise (as published by the NPCC, or any successor thereof) should be integrated into the planning and design of projects in the City's Coastal Zone.

As detailed in **Chapter 2, "Land Use, Zoning, and Public Policy,"** the Proposed Actions and resultant RWCDS would support Policy 6.2 of the WRP and there would be no significant adverse impacts associated with the Project Area's location within the 100- and/or 500-year flood zones in the future. In the future, according to NPCC projections, the Project Area would continue to be susceptible to minimal flooding risk. In addition, all new vulnerable, critical, or potentially hazardous features of the RWCDS buildings in the Project Area would be protected through flood damage reduction measures or future adaptive actions, where applicable. Such measures may include elevating critical features (i.e., back of house spaces that would likely contain MEP equipment and telecom rooms) from the building's cellar and ground floor levels to higher levels, the utilization of portable flood barriers at points of ingress and egress, or potential retrofits could be pursued to floodproof, as appropriate, the cellar and ground floor levels.

[7] Note that the decadal projections represent 30-year averages, so the 2050s represents 2040-2070, and 2080s represents 2070-2100.

Furthermore, coastal floodplains are influenced by astronomic tide and meteorological forces (e.g., northeasters and hurricanes) and not by fluvial flooding (e.g., rivers and streams overflowing their banks), and, as such, are not affected by the placement of obstructions (e.g., buildings) within the coastal floodplain. Consequently, construction and operation of the RWCDS buildings within the Project Area would not exacerbate future projected flooding conditions.