# HERKIMER-WILLIAMS EIS
# Chapter 15: 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 2021 *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 2021 *CEQR Technical Manual* recommends that a GHG consistency assessment be conducted for any project involving 350,000 square feet (sf) or more of development,[1] and other energy-intense projects.

As described in **Chapter 1, "Project Description,"** approval of the Proposed Actions would facilitate the development of five new buildings and a small retail kiosk on the projected development sites in the Project Area. The new mixed-use development on the projected development sites would either contain a combined total of approximately 1,589,202 gross square feet (gsf) under the Proposed Development, or a combined total of approximately 1,620,348 gsf under the Alternate Community Facility Scenario.[2] Therefore, a GHG consistency assessment is warranted. As further described in **Chapter 12, "Energy"** and **Chapter 13 "Transportation,"** compared to the Proposed Development, the Alternate Community Facility Scenario would generate the greatest demand for energy as well as the greatest amount of vehicle travel. Therefore, GHG emissions that would be generated by the Alternate Community Facility Scenario associated with 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 located beyond the 100- and 500- year flood zones; it is also located beyond the New York City Panel on Climate Change (NPCC) 100- and 500- year flood zone projections for the 2020s and 2050s.[3] As such, the Project Area is not susceptible to storm surge and coastal flooding and, in accordance with 2021 *CEQR Technical Manual* guidance, an assessment of potential effects of climate change is not warranted for the Proposed Actions.

[1] For purposes of CEQR environmental reviews this 350,000 sf threshold is based on building gross square footage only.

[2] 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.

[3] The most recent NPCC assessment (4th assessment) was issued in April 2024.

## 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 2021 *CEQR Technical Manual*.

It is estimated that the Alternate Community Facility Scenario associated with the Proposed Actions would result in approximately 15,093 metric tons of carbon dioxide equivalent ($CO_2e$) of annual emissions from building operations and approximately 12,836 metric tons of $CO_2e$ emissions from mobile sources annually, for an annual total of approximately 27,929 metric tons of $CO_2e$ emissions. This represents approximately 0.05 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 Alternate Community Facility Scenario under the Proposed Actions conservatively do not account for any energy efficiency measures that may be implemented and that go beyond the minimum requirements because of the Proposed Actions under the Alternate Community Facility Scenario at the Project Area. Furthermore, this analysis presents gross mobile source emissions from project-generated vehicles without considering that those vehicles would be the source of emissions in the No Action condition as well. As such, the net mobile source emissions due to the Proposed Actions are likely to be substantially less than the 12,836 metric tons of $CO_2e$ identified herein.

Under the Alternate Community Facility Scenario, the new buildings would be required at a minimum to achieve the energy efficiency requirements of the 2020 Energy Conservation Construction Code of New York State (2020 ECCCNYS), which is designed to ensure meeting the City's 80 percent by 2050 GHG reduction goal. Additionally, the Project Area is in an area supported by many transit options. By facilitating the development of new mixed-income housing alongside new office, retail, light industrial, and community facility 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 located beyond the 100- and 500-year flood zones, and therefore is not susceptible to storm surge and coastal flooding. It is also located beyond the 100- and 500-year flood zone projections developed by the NPCC for the 2020s and 2050s. Accordingly, an assessment of potential effects of climate change is not warranted for the Proposed Actions.

## 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 2021 *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 2021 *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[4] 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 2021 *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 15-1**.

**TABLE 15-1**
**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:** 2021 *CEQR Technical Manual*; DEC *2023 Statewide GHG Emissions Report*.
**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 $CO_2$ 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).

[4] *Radiative forcing* is a measure of the influence a gas has in altering the balance of incoming and outgoing energy in the Earth-atmosphere system and is an index of the importance of the gas as a GHG.

# 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[5] 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.[6] On January 20, 2021, President Biden signed an executive order to bring the United States back into the Paris Agreement after the United States officially withdrew from the agreement in November 2020.

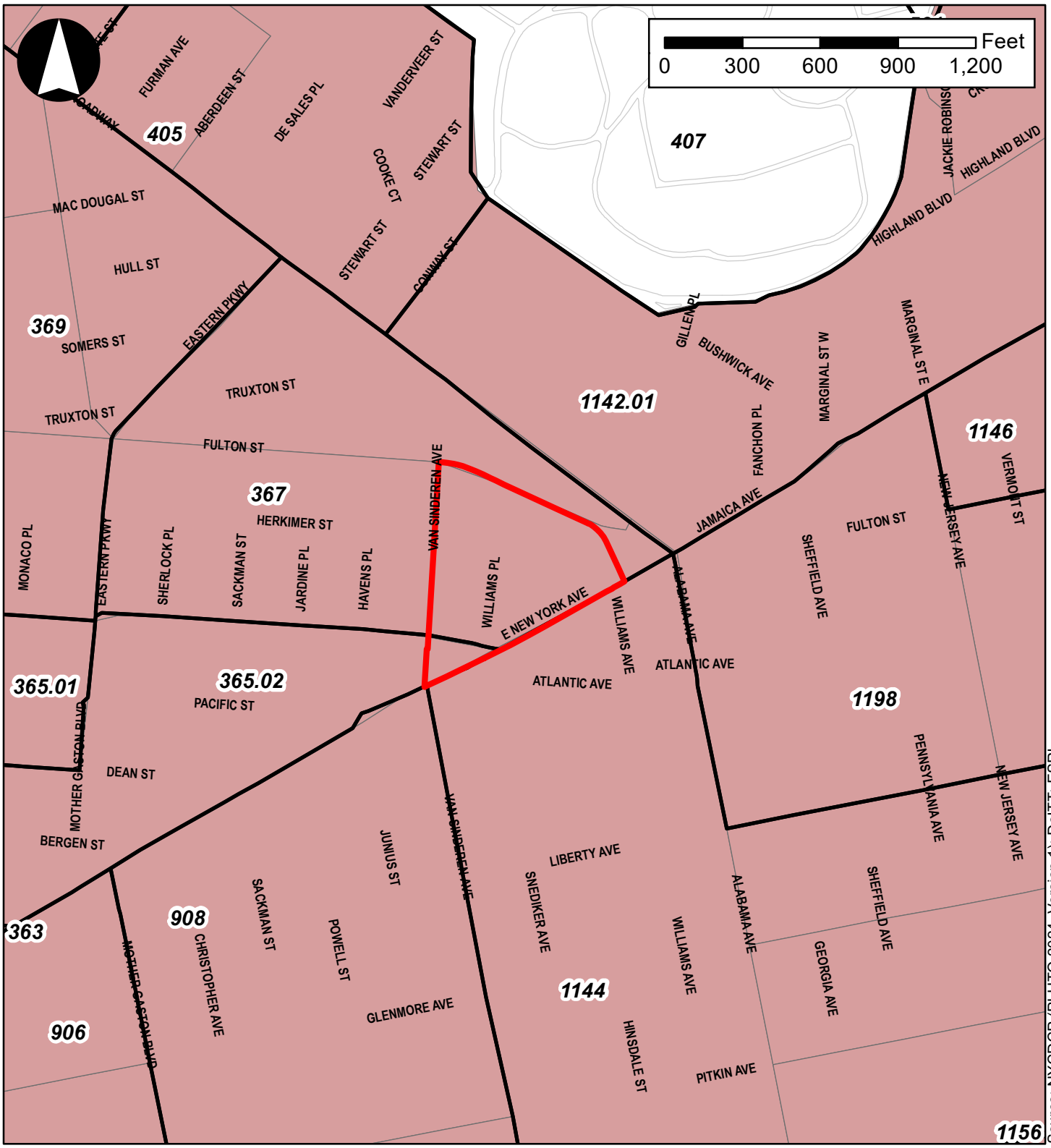
Regardless of the Paris Agreement, the United States Environmental Protection Agency (EPA) is required to regulate GHGs under the Clean Air Act and has begun preparing and implementing regulations. In coordination with the National Highway Traffic Safety Administration (NHTSA), EPA currently regulates 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

[5] Conference of the Parties, 21st Session. Adoption of The Paris Agreement, decision -/CP.21. Paris, December 12, 2015.
[6] United States of America. Intended Nationally Determined Contributions (INDCs) as submitted. March 31, 2015.

**New York State Disadvantaged Communities**




Source: NYCDCP (PLUTO 2024, Version 1); DoITT; ESRI

## Legend

- Project Area
- NYS Disadvantaged Communities (2020 Census Tracts)
- 367 2020 Census Tracts

within and surrounded by census tracts that are designated as Disadvantaged Communities.

On December 19, 2022, the CAC approved a Scoping Plan for the CLCPA.[7] 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. 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 2021, 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 took effect in December of 2023.

## 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

[7] New York Climate Act Scoping Plan; https://climate.ny.gov/resources/scoping-plan/

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 2021 *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 development of five new buildings and a small retail kiosk on the projected development sites in the Project Area. The new mixed-use development on the projected development sites would either contain a combined total of approximately 1,589,202 gsf under the Proposed Development, or a combined total of approximately 1,620,348 gsf under the Alternate Community Facility Scenario. Therefore, a GHG consistency assessment is warranted. As further described in **Chapter 12, "Energy"** and **Chapter 13 "Transportation,"** compared to the Proposed Development, the Alternate Community Facility Scenario would generate the greatest demand for energy as well as the greatest amount of vehicle travel. Therefore, GHG emissions that would be generated by the Alternate Community Facility Scenario associated with the Proposed Actions are presented herein.

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 2021 *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 2021 *CEQR Technical Manual* methodology, the assessment is based on the total GHG emissions associated with the project, rather than the relative increment of the project'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.

As the construction phase under the Proposed Actions is unlikely to represent a significant part of total emissions resulting from the Proposed Actions, a quantitative construction emissions analysis is not required pursuant to 2021 *CEQR Technical Manual* guidance, although emissions associated with the construction phase under the Proposed Actions have been described qualitatively based on other similar analyses for large building construction. Similarly, because the Proposed Actions are not expected to fundamentally change the City's solid waste management system (refer to **Chapter 11, "Solid Waste and Sanitation Services"**), an estimate of emissions from solid waste management is not warranted for the Proposed Actions.

## Building Operational Emissions

According to the 2021 *CEQR Technical Manual*, for projects 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 2021 *CEQR Technical Manual* provides the carbon intensities of New York

City building types, which were used to calculate annual operations emissions of the Alternate Community Facility Scenario 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 Alternate Community Facility Scenario 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. Average one-way trip distances as shown in Tables 18-5 and 18-6 of the 2021 *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 2021 *CEQR Technical Manual*. Table 18-7 of the 2021 *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 2021 *CEQR Technical Manual* was used to estimate GHG emissions from all trips attributable to the Alternate Community Facility Scenario.

Since the mobile GHG emissions calculator does not assume an increased percentage of electric vehicles in the regional vehicle fleet, the GHG vehicle emissions are expected to be less than shown herein as New York State implements new zero emission vehicle sale and lease requirements beginning in 2035. Furthermore, since this assessment of annual vehicle miles traveled does not account for the substantial proportion of vehicle miles that would also be traveled in the No-Action condition, it overstates the net incremental mobile source emissions generated by the Proposed Actions. For example, it can safely be assumed that the 3.6 million miles traveled by vehicles serving the residential population of the Alternate Community Facility Scenario would also be traveled in the No-Action condition, as the residents of the Alternate Community Facility Scenario would live elsewhere and continue to drive to and from their place of residence. In fact, by constructing the Alternate Community Facility Scenario in such close proximity to transit, it is possible that it will result in a net reduction in vehicle miles traveled rather than a net increase.

The projected total annual vehicle miles traveled under the Alternate Community Facility Scenario, forming the basis for the GHG emissions calculations from mobile sources, are summarized in **Table 15-2**. The mobile GHG emissions calculator was used to obtain an estimate of car, taxi, and truck GHG emissions attributable to the Alternate Community Facility Scenario.

**TABLE 15-2**
**Proposed Actions' (Alternate Community Facility Scenario) Annual Vehicle Miles Traveled (miles per year)**

| Land Use | Passenger Vehicles | Taxis | Trucks | Total |
|---|---|---|---|---|
| Residential | 3,610,559 | 85,869 | 616,626 | 4,313,054 |
| Local Retail | 2,580,272 | 0 | 206,265 | 2,786,537 |
| Destination Retail | 1,297,236 | 150,752 | 142,802 | 1,590,790 |
| Supermarket | 2,343,765 | 922,457 | 142,802 | 3,409,024 |
| Office | 10,027,184 | 435,166 | 1,487,624 | 11,949,974 |
| Higher Education Space | 149,000 | 112,235 | 41,610 | 302,845 |
| House of Worship | 19,812 | 9,448 | 97,090 | 126,350 |
| Light Industrial | 1,953,529 | 85,144 | 1,040,251 | 3,078,924 |
| Open Space | 0 | 0 | 0 | 0 |
| ***Total Increase in VMT*** | ***21,981,357*** | ***1,801,071*** | ***3,775,070*** | ***27,557,498*** |

### Construction Emissions

Consistent with common CEQR practice, emissions associated with construction have not been estimated explicitly for the Proposed Actions, but analyses prepared for large 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.[8]

### Emissions from Solid Waste Management

The Proposed Actions would not change the City's solid waste management system. Therefore, pursuant to 2021 *CEQR Technical Manual* guidance, GHG emissions from solid waste 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 15-3** displays the estimated GHG emissions associated with the operation emissions of the Alternate Community Facility Scenario. As shown in **Table 15-3**, operational GHG emissions are estimated to be approximately 15,093 metric tons of $CO_2e$. This represents approximately 0.04 percent of New York City's 2023 annual total GHG emissions from stationary energy of 36.67 million metric tons.[9] It should be noted that the estimated GHG emissions for the Alternate Community Facility Scenario under the Proposed Actions conservatively do not account for any energy efficiency measures that may be implemented.

**TABLE 15-3**
**Annual Building Operational Emissions – Alternate Community Facility Scenario**

| Building Type | CTM Carbon Intensity Rates [kg $CO_2e$/sf] | Reasonable Worst Case Development Scenario (RWCDS) Floor Area (sf) | GHG Emissions (kg) | GHG Emissions (metric tons) |
|---|---|---|---|---|
| Commercial | 9.43 | 705,659 | 6,654,364 | 6,654 |
| Industrial | 23.18 | 111,933 | 2,594,607 | 2,595 |
| Institutional | 11.42 | 114,691 | 1,309,771 | 1,310 |
| Large Residential (> 4 family) | 6.59 | 688,065 | 4,534,348 | 4,534 |
| Small Residential (1-4 family) | 4.52 | 0 | 0 | 0 |
| ***Total Operational GHG Emissions (Alternate Community Facility Scenario)*** | | ***1,620,348*** | ***15,093,091*** | ***15,093*** |

**Source:** 2021 *CEQR Technical Manual*.
**Notes:**
Commercial = Office, Retail, Garage; Industrial = Light Industrial; Institutional = House of Worship, Academic University; 1 metric ton = 1,000 kg

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

[9] 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.

## Mobile Source Emissions

The number of annual motorized vehicle trips by mode (cars, taxis and trucks) that would be generated by the Alternate Community Facility Scenario 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 2021 *CEQR Technical Manual* guidance, and do not account for reductions in VMT by vehicles redirected from existing travels to travels associated with the Alternate Community Facility Scenario. As presented in **Table 15-2** above, it is estimated that the vehicle trips generated by the Alternate Community Facility Scenario under the Proposed Actions would travel a total of 27,557,498 miles annually; annual passenger vehicle miles would total 21,981,357, annual taxi vehicle miles would total 1,801,071, and annual truck trip miles would total 3,775,070.

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 15-4**, annual mobile source emissions related to the Alternate Community Facility Scenario under the Proposed Actions would result in approximately 12,836 metric tons of $CO_2e$. This represents approximately 0.1 percent of New York City's 2023 annual total GHG emissions from transportation of 12.59 million metric tons.[10] 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 are expected to be less than shown herein as New York State implements new zero emission vehicle sale and lease requirements beginning in 2035.

**TABLE 15-4**
**Annual Mobile Source Emissions for 2036 – Alternate Community Facility Scenario**

| Carbon Dioxide Equivalent ($CO_2e$) Emissions (metric tons/year) | | | | |
|---|---|---|---|---|
| **Road Type** | **Passenger Vehicles** | **Taxis** | **Trucks** | **Total** |
| Local | 1,571.01 | 115.60 | 1,392.04 | 3,078.65 |
| Arterial | 3,178.72 | 233.11 | 2,460.27 | 5,872.10 |
| Interstate/Expressway | 2,135.43 | 153.91 | 1,595.37 | 3,884.72 |
| ***Totals*** | ***6,885.16*** | ***502.62*** | ***5,447.68*** | ***12,835.47*** |

## Summary

The total projected GHG emissions from the Alternate Community Facility Scenario under the Proposed Actions are shown in **Table 15-5**. As shown in **Table 15-5**, operational building energy emissions represent approximately 54 percent of total emissions; conversely, emissions associated with mobile sources represent approximately 46 percent of the total emissions.

[10] 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.

**TABLE 15-5**
**Summary of Total Annual GHG Emissions Under the Proposed Actions – Alternate Community Facility Scenario**

| Emissions Source | $CO_2e$ Emissions (metric tons) |
|---|---|
| Operations | 15,093 |
| Mobile Sources | 12,836 |
| ***Total*** | ***27,929*** |

The estimated total of 27,929 metric tons of GHG emissions shown in **Table 15-5** is approximately 0.05 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 Alternate Community Facility Scenario 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 are not expected to change the City's solid waste management system, and therefore emissions associated with solid waste management are not warranted for the Proposed Actions.

## Consistency with the GHG Reduction Goal

According to the 2021 *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 2021 *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 2021 *CEQR Technical Manual*. Following the approach defined in the 2021 *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 five new buildings and a small retail kiosk on previously developed urban land, thereby minimizing vegetation/forest loss that would occur at a greenfield location. Furthermore, the Proposed Actions would facilitate the Alternate Community Facility Scenario on projected development sites with existing urban infrastructure, including public sidewalks, transit, sewers, and water mains, thereby minimizing the need for extensive infrastructure development.

The Alternate Community Facility Scenario 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 2021 *CEQR Technical Manual* of building efficient buildings.

### *Use Clean Power*

The Alternate Community Facility Scenario 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 in an area supported by many transit options. These include the LIRR and multiple subway lines and bus routes with connections to the regional public transportation network (refer to **Chapter 13 "Transportation"** for additional details), as well as a growing bicycle lane network and bicycle share program (i.e., Citi Bike). The Alternate Community Facility Scenario 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 office, retail, light industrial, 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 if the Proposed Actions and other transit-oriented development are not implemented. 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.[11] Likewise, while approximately 19.4 percent of trips by residents as a result of the Alternate Community Facility Scenario 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.[12] In contrast, the Alternate Community Facility Scenario facilitated under 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

[11] 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.

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

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 building structures comprising the Alternate Community Facility Scenario would be predominantly concrete, with some steel supports (rebar). Recycled steel will most likely be used for most structural steel rebar, since the steel available in the region is mostly recycled. Some cement replacements such as fly ash and/or slag may also be used, and concrete content would be optimized to the extent feasible. The Alternate Community Facility Scenario 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.