

15. Greenhouse Gases

This chapter addresses the Proposed Project’s potential effects related to greenhouse gas (GHG) emissions. GHGs trap heat in the atmosphere and include gases such as carbon dioxide (CO₂), methane, nitrous oxide, and fluorinated gases. Most GHG emissions from transportation come from combustion of fossil fuels either directly or through electrical power generation.

15.1 KEY CONCLUSIONS

There would be no adverse impacts to GHGs under the Proposed Project. Key conclusions from this analysis include the following:

- The Proposed Project would reduce auto-related vehicle-miles travelled in the study area.
- The decrease in GHG emissions caused by reducing auto vehicle-miles travelled would be slightly greater than the increase in GHG emissions from producing electrical energy to power the new service.
- Maintenance and operations of vehicles, the proposed stations and the proposed employee welfare facility at New Rochelle Yard would increase net GHG emissions from the Proposed Project.

15.2 METHODOLOGY

To date, no national standards have been established regarding GHGs, nor has EPA established criteria or thresholds for ambient GHG emissions pursuant to its authority to establish motor vehicle emission standards for CO₂ under the Clean Air Act. However, the CEQ released final guidance in 2016 for Federal agencies on how to consider the impacts of their actions on global climate change in their NEPA reviews.¹ In this guidance, CEQ advises agencies to quantify projected GHGs of proposed Federal actions in environmental assessments and environmental impact statements whenever the necessary tools, methodologies, and data inputs are available.

GHGs differ in their respective abilities to trap heat. To compare emissions of different GHGs, a weighting factor called a Global Warming Potential is used. The heat-trapping ability of 1 metric ton of CO₂ is taken as a standard, and emissions of other GHGs are rated relative to it. The impact of emissions of other GHGs is described by their Global Warming Potential and expressed in CO₂ equivalents (CO₂eq) (Table 15-1).

Table 15-1. Global Warming Potential

Greenhouse Gas	Global Warming Potential
Carbon Dioxide	1
Methane	21
Nitrous Oxide	310

Source: U.S. Environmental Protection Agency Greenhouse Gas Inventory, 2013

¹ https://ceq.doe.gov/docs/ceq-regulations-and-guidance/nepa_final_ghg_guidance.pdf



MTA used two methodologies to estimate net GHG emissions from the Proposed Project.

- Vehicle Travel – The U.S. Environmental Protection Agency (EPA) emission model, MOVES, estimated CO₂eq emissions from vehicle travel associated with the No Action Alternative and the Proposed Project.
- GHG Emissions from Electric Trains – The EPA’s Emissions and Generation Resource Integrated Database estimated a CO₂e emission factor for the New York City/Westchester County subregion for GHG emissions from electric trains.²

In addition, the Federal Transit Administration developed a Transit Greenhouse Gas Estimator tool as a resource to estimate GHG emissions from transit projects with limited project data based on national scale assumptions. This tool quantifies emissions from construction, project operation, and project maintenance. MTA included GHG emissions from the Proposed Project (train operations and displaced vehicle exhaust) in the emissions modeling performed as part of the air quality analysis. This methodology was used in place of the assumptions suggested in the Federal Transit Administration tool to present a more refined Proposed Project-specific emissions estimate. MTA used the following methodology described in the Transit Greenhouse Gas Estimator User Guide³ to estimate GHG emissions from other maintenance and operations activities:

- MTA estimated vehicle-maintenance emissions based on the annual mileage traveled by the personal vehicles.
- MTA based emissions from operating the four proposed stations and an employee welfare facility at the expanded New Rochelle Yard on the square footage of each facility, representing typical electricity and heating needs.
- MTA assumed maintenance of the existing track would be unchanged as compared to existing conditions.

Chapter 19, “Construction and Construction Impacts,” assesses the potential adverse effects during construction.

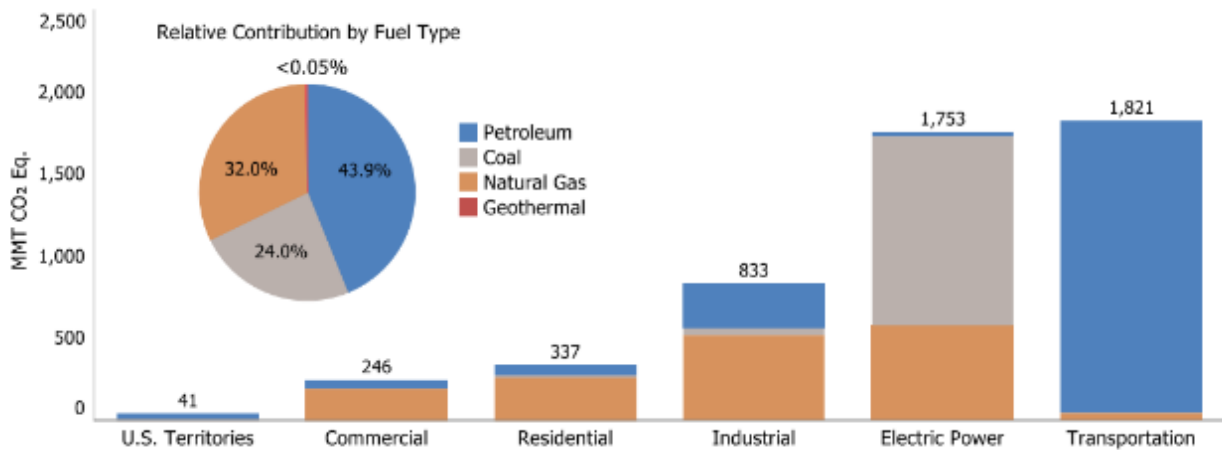
15.3 EXISTING CONDITIONS

According to EPA’s national GHG inventory, as of 2018, the transportation sector was the greatest contributor to GHG emissions in the United States, contributing roughly one-third of the total (Figure 15-1). Power generation and transportation were the biggest sources of GHG, together accounting for over two-thirds of GHG emissions nationwide.

² https://www.epa.gov/sites/production/files/2020-01/documents/egrid2018_summary_tables.pdf

³ https://www.transit.dot.gov/sites/fta.dot.gov/files/docs/FTA_GHG_Emissions_Estimator_User_Guide_0.pdf

Figure 15-1. Carbon Dioxide Emissions from Fossil Combustion by Sector and Fuel Type (2018)



Source: U.S. Environmental Protection Agency Greenhouse Gas Inventory, 2020

15.4 NO ACTION ALTERNATIVE

Although new Metro-North service to Penn Station New York will not be initiated under the No Action Alternative, traffic growth is expected; therefore, GHG emissions will likely increase in the No Action Alternative compared to existing conditions. Table 15-2 shows the GHG emissions for the No Action Alternative.

15.5 PROPOSED PROJECT

The GHG emissions analysis for the vehicle travel and electric trains using EPA’s MOVES and Emissions and Generation Resource Integrated Database indicates that the Proposed Project would decrease GHG emissions compared to the No Action Alternative (Table 15-2).⁴

Table 15-2. Annual Greenhouse Gas Emissions: No Action Alternative and Proposed Project (2025)

Emission Sources	No Action Alternative (metric tons)	Proposed Project (metric tons)	Change (metric tons)
Vehicles	21,481,426	21,469,617	-11,809
Trains	86,470	97,466	10,997
TOTAL	21,567,896	21,567,083	-812

Source: WSP, 2020

Using the Federal Transit Administration Transit Greenhouse Gas Estimator, MTA estimated additional annual GHG maintenance and operations emissions. Table 15-3 shows the emission factors and assumptions for the maintenance and operation activities.

⁴ Table 13-4 in Chapter 13, “Air Quality,” presents the VMT for the No Action Alternative and the Proposed Project for each region considered in this study. Table 14-2 in Chapter 14, “Energy,” presents the rail car miles under the No Action Alternative and the Proposed Project.

**Table 15-3. Annual Greenhouse Gas Emissions: Proposed Project Maintenance and Operations**

Phase	Source	Emission Factor (metric tons CO ₂ e)	Project Assumption	GHG Emissions (metric tons CO ₂ e)
Maintenance	Vehicles	0.0010 miles/year	907,200 miles	907
Operations	Stations (4)	0.0117 square feet/year	52,200 square feet	611
Operations	Maintenance/Storage Facility (electricity)	0.0121 square feet/year	2,400 square feet	29
Operations	Maintenance/Storage Facility (heat)	0.0018 square feet/year	2,400 square feet	4
TOTAL				1,551

Source: WSP, 2020

15.6 CONCLUSION

Considering the emissions from vehicles and trains, the Proposed Project would decrease GHG emissions compared with the No Action Alternative. GHG emissions due to the introduction of electric trains would be offset by emission reductions from reduced vehicular trips. The GHG emissions from maintenance and operations of vehicles, the proposed new stations, and the proposed new employee welfare facility would increase net emissions from the Proposed Project by 739 metric tons of CO₂e per year.