

**10.1 INTRODUCTION**

This chapter addresses the Modified Design's potential effects related to greenhouse gas (GHG) emissions. GHGs trap heat in the atmosphere and include gases such as carbon dioxide (CO<sub>2</sub>), methane (CH<sub>4</sub>), nitrous oxide (N<sub>2</sub>O), and fluorinated gases. GHGs can result from construction activities, as well as from exhaust from vehicles (including trains). However, trains are typically a more efficient form of transportation than private automobiles (i.e., they are able to move larger numbers of passengers with less overall fuel consumption) and usually provide a benefit with respect to GHG emissions. The 2004 FEIS did not include an analysis of GHG, since such an analysis was not typically included in NEPA documentation at that time.

**10.2 FEIS FINDINGS**

The 2004 FEIS did not address GHG because a GHG analysis was not required or typically performed at that time. The 2004 FEIS did note (in FEIS Chapter 2, page 2-6) that the Second Avenue Subway will comply with the Environmental Management System (EMS) established by NYCT, which establishes protocols to achieve energy efficiency, enhanced indoor environmental quality, conservation of materials and resources, and water conservation and site management. The EMS conforms with the ISO 14001 Standard, an internationally recognized system that provides a disciplined framework under which NYCT can demonstrate control over key issues related to raw materials consumption, energy usage, emissions, wastes, products, transport, distribution, and services. The EMS requires not only a continuing compliance with relevant legislation but also that NYCT remain committed to achieving improvements in these key issues. A key aspect of this system involves the adoption of Design for the Environment Guidelines for use during the Project's design phase.

**10.3 UPDATE OF BACKGROUND CONDITIONS**

Since the publication of the 2004 FEIS, environmental documents now typically include an assessment of a project's GHG emissions. The analysis also evaluates opportunities for projects or actions to reduce energy consumption and GHG emissions.

**10.4 PHASE 2 MODIFIED DESIGN—CHANGES IN IMPACTS****10.4.1 CONSTRUCTION IMPACTS**

As with any construction project, for the construction of Phase 2, there would be GHG emissions associated with the extraction, production, and transport of materials used for construction such as cement and steel, as well as emissions from fuels consumed for transport of materials and personnel to and from the sites, and energy use on-site (electricity and fuel) for non-road engines.

Similar to the 2004 FEIS Design, the Modified Design would comply with sustainability guidelines established by MTA and NYCT, in order to achieve energy efficiency, enhanced indoor

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environmental quality, conservation of materials and resources, and water conservation and site management. Opportunities to reduce construction emissions are associated with the use of lower-carbon and renewable alternatives to the materials used, shorter distances for the disposal and/or reuse of excavated materials, and the use of biodiesel or renewable energy for construction. The use of biodiesel blends (B20) will be recommended for future Project contractors. Materials with recycled content, such as slag and flyash used in cement mixes, may be used during construction.

### **10.4.2 PERMANENT IMPACTS**

Since the Project is a transit project, the change in GHG emissions associated with Phase 2's operations would largely be a net benefit. There would be some emissions associated with power supply for vehicle operations, and increases in energy use would occur for system lighting, ventilation, cooling, and other equipment. However, the 2004 FEIS air quality analysis demonstrated a regional reduction in criteria pollutant emissions based on a shift of on-road trips to transit; a similar benefit would be achieved for GHG emissions. Furthermore, MTA has studied the net effect of the New York City transit system,<sup>1</sup> and found that in addition to the direct GHG emissions reduction, the transit system results in reduced congestion and benefits that have developed over the years in the efficiency of New York City's land use patterns as a result of the transit system—people living nearer to their destinations and more efficient homes and buildings. The study demonstrates that the New York City transit system has more than an eight-fold net benefit, meaning that the system reduces more than eight times the emissions it creates. The subway system is by far the most efficient of the MTA transit modes. Therefore, the net change associated with Phase 2 operations would be a net reduction in energy use and GHG emissions.

In terms of the inclusion of further energy saving opportunities in the design, MTA does incorporate enhanced energy efficiency in its building and systems design, as well as vehicle operations such as regenerative braking (braking produces electric power rather than being dissipated as heat and mechanical wear).

### **10.5 CONCLUSIONS**

Like any construction project, construction of Phase 2 of the Second Avenue Subway would involve some GHG emissions associated with the extraction, production, and transport of materials used for construction. Given the high projected usage of the system and the potential energy and GHG benefits of shifting trips to efficient transit, and the extended benefit that the transit system effects on the efficiency of New York City land use in general, the operational benefits of the Second Avenue Subway likely far exceed the construction-related GHG emissions. The findings in this chapter are consistent with FTA's Programmatic Assessment of GHG emissions from transit projects (FTA report #0097), which was published on January 18, 2017. Heavy rail projects result in a net decrease in GHG, and FTA and MTA NYCT hereby incorporate the Programmatic Assessment by reference into this Supplemental EA. \*

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<sup>1</sup> MTA. *Impact of Public Transportation on GHG in the MTA Area*. 2009; MTA. *An Average MTA Trip Saves Over 10 Pounds of Greenhouse Gas Emissions*. 2012.