

## 4.14 Air Quality

### 4.14.1 Introduction

This chapter identifies the air quality conditions for the Meadowlands Railroad and Roadway Project for the existing condition, and discusses the screening analyses performed to determine if detailed analysis is required for the proposed project. The air quality characteristics are identified and discussed within the context of the Clean Air Act (CAA) of 1990 requirements and applicable federal and state air quality standards and regulations.

### 4.14.2 Primary Pollutants

Six pollutants have been identified by the United States Environmental Protection Agency (USEPA) as a national concern: carbon monoxide (CO), nitrogen dioxide (NO<sub>2</sub>), ozone (O<sub>3</sub>), particulate matter (PM), sulfur dioxide (SO<sub>2</sub>) and lead (Pb). The primary pollutant emissions from automobiles are CO, hydrocarbon (HC) and nitrogen oxides (NO<sub>x</sub>). Levels of NO<sub>x</sub> and PM are influenced by both mobile and stationary sources, while levels of SO<sub>2</sub> are directly associated with stationary sources. Pollutant characteristics are as follows:

- *Carbon Monoxide* - Carbon monoxide is a colorless and odorless gas, associated with the incomplete combustion of vehicle fuel. Carbon monoxide (CO) concentrations are limited to short distances near crowded intersections and along slow moving, heavily traveled roadways. Under the CAA, each state is committed to offset any CO emissions resulting from vehicle miles traveled (VMT) growth in a non-attainment or maintenance area. Therefore, it is important to predict CO concentrations on a local or microscale basis. For projects of regional significance, it is also important to predict CO emissions on a regional, or mesoscale basis.
- *Nitrogen Oxides* - Nitrogen oxides are produced when fuels are burned at high temperatures. Only nitric oxide (NO) and nitrogen dioxide (NO<sub>2</sub>) are released by motor vehicles into the atmosphere in appreciable quantities. Together, nitrogen oxides are often referred to as NO<sub>x</sub>. Nitrogen oxides are of particular concern due to their role in the formulation of ozone.
- *Ozone* – Ozone is formed through a series of chemical reactions, which occur in the presence of sunlight and hot weather. Motor vehicle exhaust and industrial emissions, gasoline vapors and chemical solvents are some of the major contributors to the formation of ground-level ozone. Elevated levels of ozone typically occur miles from the source since the series of chemical reactions is slow and pollutants are diffused downwind.

- *Lead* - Lead emissions are associated with industrial uses and motor vehicles that use gasoline containing lead additives. Most U.S. vehicles available since 1975 and all after 1980 are designed to use unleaded fuel. As newer models have replaced these older vehicles, lead emissions have decreased.
- *Inhalable Particulates* – Inhalable particulates are broken down into coarse particulate matter (PM<sub>10</sub>) and fine particulate matter (PM<sub>2.5</sub>). New Jersey has standards for Total Suspended Particulates (TSP), which includes the coarser particulates, as well as the finer particulates identified by USEPA.
  - *Coarse Particulate Matter (PM<sub>10</sub>)* - Particulate matter is emitted into the atmosphere from a variety of sources including industrial facilities, power plants and construction activity. Diesel-powered vehicles, especially heavy trucks and buses, emit particulates. Inhalable particulate concentrations may be locally elevated near roadways with high volumes of heavy diesel-powered vehicles. The primary concern is with particulates that are less than 10 microns (mm, 1 micron equals 0.000001 meter or one one-millionth of a meter) in diameter.
  - *Fine Particulate Matter (PM<sub>2.5</sub>)* - Recent scientific developments have indicated a connection between respiratory problems such as asthma and bronchitis with fine particulate particles that have an aerodynamic diameter of 2.5 microns or smaller. PM<sub>2.5</sub> emissions are primarily from stationary and mobile sources that burn fossil fuels.
- *Sulfur Dioxide* - Sulfur dioxide (SO<sub>2</sub>) emissions are primarily associated with the combustion of sulfur containing fuels such as oil and coal. The major sources of this emission are fossil fuel fired power plants and oil refineries. No significant quantities are emitted from mobile sources.

#### 4.14.3 Air Quality Standards and Ambient Conditions

National Ambient Air Quality Standards (NAAQS) and New Jersey Ambient Air Quality Standards (NJAAQS) have been established for the six major air pollutants identified above. The primary standards are intended to prevent adverse health effects, while the secondary standards are intended to further protect the public welfare by minimizing material damage and maximizing visibility.

The NJDEP operates a network of monitoring stations throughout the State to measure ambient air quality. Table 4.14-1 shows the air quality reported to USEPA for 2003 and the New Jersey and National Ambient Air Quality Standards. As shown in this table, background pollutant concentrations for the project area meet the NAAQS for all pollutants except ozone.

**Table 4.14-1 New Jersey and National Ambient Air Quality**

Pollutant	Averaging Period	New Jersey AAQS <sup>1</sup>		NAAQS <sup>2</sup>		2003 Air Quality Values <sup>3</sup>
		Primary	Secondary	Primary	Secondary	
Carbon Monoxide (CO)	1-hour	35 ppm	35 ppm	35 ppm	----	5.5 ppm (2 <sup>nd</sup> max.)
	8-hour	9 ppm	9 ppm	9 ppm	----	2.0 ppm (2 <sup>nd</sup> max.)
Nitrogen Dioxide	Annual	0.05 ppm	0.05 ppm	0.05 ppm	0.05 ppm	0.02 ppm (annual mean)
Ozone (O <sub>3</sub> )	1-hour <sup>3</sup>	0.12 ppm	0.08 ppm	0.12 ppm	0.12 ppm	0.14 ppm (2 <sup>nd</sup> max.)
	8-hour	----	----	0.08 ppm	0.08 ppm	0.10 ppm (4 <sup>th</sup> max.)
Lead (Pb)*	3-month	1.5µg/m <sup>3</sup>	1.5µg/m <sup>3</sup>	1.5µg/m <sup>3</sup>	1.5µg/m <sup>3</sup>	.02 µg/m <sup>3</sup>
Sulfur Dioxide (SO <sub>2</sub> )	3-hour	----	0.5 ppm	----	0.5 ppm	N/A
	24-hour	0.14 ppm	0.10 ppm	0.14 ppm	----	.02 ppm (2 <sup>nd</sup> max.)
Particulates (PM <sub>10</sub> )	24-hour	----	----	150µg/m <sup>3</sup>	150µg/m <sup>3</sup>	125 µg/m <sup>3</sup> (98 <sup>th</sup> percentile)
	Annual	----	----	50µg/m <sup>3</sup>	50µg/m <sup>3</sup>	24 µg/m <sup>3</sup> (annual mean)
Particulates (PM <sub>2.5</sub> )	24-hour	----	----	65µg/m <sup>3</sup>	65µg/m <sup>3</sup>	45 µg/m <sup>3</sup> (98 <sup>th</sup> percentile)
	Annual	----	----	15µg/m <sup>3</sup>	15µg/m <sup>3</sup>	13.9 µg/m <sup>3</sup> (annual mean)
Total Suspended Particulates	24-hour	260µg/m <sup>3</sup>	150µg/m <sup>3</sup>	----	----	N/A
	Annual	75µg/m <sup>3</sup>	60µg/m <sup>3</sup>	----	----	N/A

<sup>1</sup> New Jersey short-term standards are not to be exceeded more than once in any 12-month period.

<sup>2</sup> National short-term standards are not to be exceeded more than once in a calendar year.

<sup>3</sup> The 2<sup>nd</sup> and 4<sup>th</sup> maximum values are the respective, second and fourth highest air quality pollution levels in the monitoring region.

Source: United States Environmental Protection Agency, 2004 and New Jersey Department of Environmental Protection, 2004.

#### 4.14.4 State Implementation Plan

The federal Clean Air Act of 1990 (CAA) requires each state to submit a State Implementation Plan (SIP) to the USEPA for attainment of NAAQS. The SIP describes how the state will attain and maintain air quality standards in non-attainment areas, and must be approved by USEPA. Projects that do not result in violation of the NAAQS and conform to the attainment plans in the SIP are considered consistent with the SIP.

The entire New York Metropolitan Area, including the Meadowlands Railroad and Roadway Project study area, was designated and classified as an ozone and PM<sub>2.5</sub> nonattainment area. For CO, the New York City portion has since been redesignated as attainment (effective May 20,

2002) due to the execution of the New York State SIP. The New Jersey portion has also been redesignated as attainment for CO (effective October 22, 2002).

#### **4.14.5 Air Quality Screening Analysis**

A screening analysis has been performed for the proposed project, to determine if a refined air quality modeling analysis is necessary.

##### **4.14.5.1 Mobile Source Analysis**

Criteria for screening future mobile source emissions are based on the amount of traffic induced by the project. Intersections within or near the study area that currently experience the highest amount of traffic congestion, or are anticipated to experience significant increases in traffic congestion from the proposed project, are selected for detailed analysis.

An intersection impacted by a project is generally excluded from detailed air quality modeling if it has a LOS A, B or C. Other factors such as proximity to sensitive receptors (schools, hospitals, residences, etc.) are also taken into consideration at intersections with a LOS of A, B, or C. If an intersection has a LOS of D or worse (E or F), then a refined air quality modeling analysis would be required.

Improvements associated with the proposed project would guarantee that no conflicts between Murray Hill Parkway and the North Connector Road and the proposed rail link exist. In the case of Murray Hill Parkway, it is proposed that the rail alignment would rise above grade and fly over Murray Hill Parkway, which would remain at grade. In the case of the North Connector Road, improvements associated with the proposed Meadowlands Rail Project would keep this road above grade, with the rail running below it. There would be no publicly accessible at-grade intersections with the rail line, and therefore no public grade crossings. There would exist a private grade crossing for Sport Complex operational purpose. As a result, there would be no intersection impacts associated with the proposed project. As indicated in Table 4.13-13, the LOS for the Build Alternative at Paterson Plank Road and Berry's Creek Road would remain the same or improve over the No Build Condition. Further, both intersections are located far away from potential sensitive receptors as identified above. Given the screening criteria, no air quality modeling analysis is warranted.

##### **4.14.5.2 Stationary Source Analysis**

No major stationary source generators exist as part of the proposed project that could emit significant quantities of pollutants. The proposed station building would include elevators and amenities such as lighting, benches, waste receptacles, signage and ticket vending machines. These improvements would not generate any significant amount of stationary source pollutants. There is no parking associated with the proposed station. Some Meadowlands Sports Complex

parking areas would be reorganized in association with the proposed project, but would not increase or reduce the existing parking stock. No stationary source air quality impacts are expected; therefore, further analysis is not warranted.

#### **4.14.5.3        *Mesoscale Analysis***

A mesoscale analysis determines the net regional effects of a proposed Project on the emission of pollutants. This is determined by assessing the change in regional air quality based on the reduction in vehicle-related emissions, as compared to the increase in locomotive-related emissions.

The proposed Project is intended to expand the modal choice currently available to visitors to the Meadowlands Sports Complex, who currently may access the complex either by automobile or bus only. Travel time to the area is unreliable due to extremely congested conditions on area roadways, particularly during weekday peak periods and during events.

The proposed Project would attract significant numbers of existing automobile and bus users to become rail users. The proposed Meadowlands rail station would be a destination station; therefore the project does not include a park-and-ride. No new vehicle trips would be generated by the Project. By removing vehicles from the regional transportation network, a reduction in regional vehicle miles traveled (VMT) would result. While new emissions resulting from the increased locomotive travel would partially negate the benefits of the reduced vehicle emissions, the net effects would still represent a benefit to the regional air quality. Therefore, further analysis is not warranted.