

19.1 INTRODUCTION

This chapter assesses the potential effects on public health from the No Action Alternative and construction and operation of the Preferred Alternative. The determination of impacts is based on the analysis results reported in the other relevant chapters of this Environmental Impact Statement (EIS). As detailed below, the potential effects could be influenced by air quality, water quality, hazardous materials, or noise within the study areas. The associated analyses pertaining to the overall public health conditions of the study areas are summarized below, along with an evaluation of the potential for predicted temporary construction or permanent operational adverse impacts of the Preferred Alternative.

This chapter also discusses the potential for public health impacts resulting from Electric and Magnetic Fields (EMF); as discussed further below, a detailed assessment of EMFs for the construction and operation of the Preferred Alternative is not warranted.

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19.2 PUBLIC HEALTH

19.2.1 ANALYSIS METHODOLOGY

During development of this EIS, the Federal Railroad Administration (FRA) and NJ TRANSIT developed methodologies for evaluating the potential effects of the Hudson Tunnel Project in coordination with the Project's Cooperating and Participating Agencies (i.e., agencies with a permitting or review role for the Project). The methodologies used for analysis of public health effects of the Project are summarized in this chapter.



19.2.1.1 REGULATORY CONTEXT

The FRA's *Procedures for Considering Environmental Impacts*¹ indicate that public health should be considered in environmental reviews of proposed actions. In addition, for projects undergoing environmental review by New York City agencies, the *New York City Environmental Quality Review (CEQR) Technical Manual* states that for most projects, a public health analysis is not necessary. However, if adverse impacts that cannot be mitigated are identified in other analysis areas, such as air quality, water quality, hazardous materials, or noise, an assessment is appropriate.

19.2.1.2 ANALYSIS TECHNIQUES

For this public health impacts assessment, *CEQR Technical Manual* assessment methodologies have been applied to both the New Jersey and New York study areas because this is the most conservative, comprehensive methodology available for projects proposed in the New York City area and provides a consistent corresponding assessment of health impacts for New Jersey. FRA and NJ TRANSIT therefore also used these criteria used for conclusions about public health impacts in accordance with the National Environmental Policy Act (NEPA). Conclusions regarding public health effects of the No Action and Preferred Alternatives are based on the analyses of the following subject areas: air quality, contaminated materials, noise, and water quality (which is included as a component of the Natural Resources evaluation), consistent with the *CEQR Technical Manual* guidance for public health analyses. Other public health impacts are discussed in the relevant analysis chapters. The impact analyses for the resources described in this chapter have been reviewed to determine whether the Preferred Alternative would result in any impacts that cannot be mitigated, indicating a potential impact related to public health.

19.2.1.3 STUDY AREA

The public health impacts and EMFs assessment addresses the overall effects of the Preferred Alternative, and therefore does not have a particular geographic study area.

19.2.2 AFFECTED ENVIRONMENT: EXISTING AND FUTURE CONDITIONS

Following the *CEQR Technical Manual* guidance, the analysis of public health effect, for the purpose of this chapter, is focused solely on the baseline descriptions of air quality, water quality, hazardous materials, or noise in the respective EIS chapters. All other potential impacts to public health are identified and fully described in other chapters of this EIS.

19.2.3 IMPACTS OF NO ACTION ALTERNATIVE

In the No Action Alternative, the existing North River Tunnel will remain in service, with continued maintenance as necessary to address ongoing deterioration to the extent possible. However, without a full rehabilitation of the North River Tunnel, damage to the tunnel caused by Superstorm Sandy would continue to degrade systems in the tunnel. This deterioration combined with the tunnel's age and intensity of use would likely lead to increasing instability of rail operations in the tunnel, the need for increasingly frequent unplanned maintenance and repairs, and may lead to its eventual closure.

As discussed in Chapter 5B, "Transportation Services," the No Action Alternative would result in adverse transportation impacts to trans-Hudson bus service as passenger rail service

¹ 64 Federal Register 28545, May 26, 1999.

disruptions transfer more riders from rail to buses, overburdening a system that is also close to capacity. In addition, under the No Action Alternative, if Northeast Corridor (NEC) North River Tunnel passenger rail service is disrupted for emergency repairs, passengers may also be diverted to trans-Hudson ferry services or into private automobiles. Accordingly, there is the potential for worsening air quality concentrations in the vicinity of the Project site under the No Action Alternative as a result of the mode shift from electrically powered trains, which are less of a concern in terms of air quality emissions, to buses, ferries, and automobiles, which could result in increased emissions from fossil fuel combustion (e.g. diesel or gasoline). As a result of increased emissions, air quality conditions could worsen along roadways connecting New Jersey and New York that would be used by commuters and others that otherwise would have used rail services. Collectively, these shifts from rail to on-road modes would also increase traffic congestion in the area, which in many locations, is already overburdened and at or near capacity, particularly during peak commuting hours. These increases in vehicular traffic would also have corresponding increases in noise levels, which in some locations, could result in additional impacts, especially if new routes are used because more direct or regular routes are experiencing oversaturated conditions as a result of the modal shift from rail to on-road vehicles (e.g., private automobiles and buses).

19.2.4 CONSTRUCTION IMPACTS OF THE PREFERRED ALTERNATIVE

Potential effects on public health could be influenced by air quality, water quality, hazardous materials, or noise within the study areas. The associated analyses pertaining to the overall public health conditions of the study areas during construction of the Preferred Alternative are summarized below.

19.2.4.1 AIR QUALITY

As discussed in Chapter 13, "Air Quality," Section 13.6, construction of the Preferred Alternative would result in a temporary increase in air emissions near construction sites. The sources of these emissions would be construction-related traffic and on-site construction-related mobile and stationary sources. The U.S. Environmental Protection Agency (EPA) has established National Ambient Air Quality Standards (NAAQS) to protect public health and welfare. To demonstrate compliance with these standards, maximum predicted off-site incremental concentrations from estimated emissions during construction of the Preferred Alternative were added to conservative background conditions. With the Preferred Alternative, the maximum predicted total concentrations of carbon monoxide, sulfur dioxide, nitrogen dioxide, PM₁₀, and PM_{2.5} would be below the applicable NAAQS within the New Jersey and New York portions of the study area.

New York and New Jersey do not require permits to control the emissions from construction engines. However, mitigation measures would be implemented during construction of the Preferred Alternative to reduce pollutant emissions in accordance with all applicable laws, regulations, and best management practices (BMPs). For example, a Project-specific emissions reduction program would be developed and implemented to minimize the air quality effects from construction under the Preferred Alternative as described in detail in Chapter 13, "Air Quality," including the following: dust control measures; use of clean fuels; requiring idling restrictions; use of best available tailpipe reduction technologies; utilization of newer equipment; and reduction of use of diesel equipment. With the implementation of these measures to reduce pollutant emissions identified in the air quality analysis, there would be no adverse impacts to air quality from construction of the Preferred Alternative.

Therefore, no public health impacts would occur related to changes to air quality during construction of the Preferred Alternative.



19.2.4.2 WATER QUALITY

As described in Chapter 11, “Natural Resources,” Section 11.6, the Preferred Alternative would not result in any adverse impacts to water quality in the Project area during construction. Therefore, no public health impacts would occur related to water quality during construction of the Preferred Alternative.

19.2.4.3 HAZARDOUS MATERIALS

As described in Chapter 16, “Contaminated Materials,” Section 16.6, construction of the Preferred Alternative could result in temporary adverse impacts related to hazardous materials. To avoid any potential adverse impacts to public health from contaminated materials during construction of the Preferred Alternative on sites with known or potential contamination of soil or groundwater, a number of preventative measures will be implemented to minimize exposure as described in detail in Chapter 16, and summarized below:

- Phase II Site Investigation (SI) soil and groundwater sampling activities, as well as hazardous materials building investigations, will be performed at selected sites along the Project site where the potential for contamination exists. These activities will determine the presence or absence of contaminants, and assess their chemical and physical characteristics to determine the potential exposure associated with the work to be performed, and thus any corollary health hazards. Based on the findings of these initial investigations, additional investigations may be undertaken to further determine the extent and levels of contamination at the affected properties, and how any resulting potential health hazards can be avoided.
- Development of a Health and Safety Plan (HASP), which would set out procedures for handling contaminated materials, response plans, appropriate personnel training and monitoring, personal protective equipment, and procedures to minimize dust generation.
- Development of a Project-wide Materials Management Plan (MMP), which would provide procedures for materials handling during construction activities including BMPs to be implemented during construction. Excavated rock would be characterized prior to disposal or reuse. Any sediment or mixture of sediment and grout removed from the river would be treated as contaminated soils and would be characterized for potential reuse offsite or disposal at a suitably permitted facility, after dewatering. The transportation, beneficial reuse, and/or off-site disposal of contaminated material would be conducted in accordance with Federal, state, and local regulations. All waste would be transported via licensed transporters for disposal at an appropriately licensed facility. Each container or load would be accompanied by an applicable non-hazardous or hazardous waste manifest.
- Naturally occurring asbestos (NOA) is not subject to the same framework of federal/state and local regulations and requirements as asbestos containing building materials, which are products, such as insulation materials, made from NOA. However, any beneficial reuse or off-site disposal of any such asbestos-containing rock which would, at a minimum, be conducted in accordance with Federal and state regulations. There is no specific New Jersey or New York State guidance for the handling of NOA: however, since NOA can be harmful to human health implementing prudent measures to avoid/reduce exposure, as would be appropriate for ACM, is common practice. Because there is the potential to encounter NOA serpentinite minerals during construction of the Preferred Alternative, especially during excavation and tunneling operations, measures to mitigate exposure to

NOA would be implemented as part of the SMMP, consistent with OSHA Asbestos standards.²

- Approaches for reducing NOA exposure are similar to practices used for ACM in commercial applications. Typical engineering controls involve the use of covers and caps, vegetation, fencing, landscaping, and in some conditions, the application of water to suppress dust. Common work practices include limiting activities on NOA-containing areas, reducing driving speed on unpaved roads that may contain NOA, and cleaning vehicles driven over NOA. Worker health and safety measures that include respiratory protection may also be warranted.³
- Following hazardous waste management regulations (Federal, state, and local), including acquiring necessary permits to generate, store, treat, transport, and/or dispose of hazardous waste. Groundwater would be managed in accordance with applicable permits.
- Following construction, disturbed areas would be restored using engineering controls that would prevent direct human exposure, and construction staging areas would be restored to preconstruction conditions or capped.
- Proposed construction in New Jersey would be completed in accordance with the New Jersey Department of Environmental Protection's (NJDEP) Linear Construction Technical Guidance, and a Soil Erosion and Sediment Control Plan.

With the implementation of these preventative measures, construction of the Preferred Alternative would not result in temporary adverse impacts related to hazardous materials in any portion of the study area. Therefore, no public health impacts would occur related to contaminated materials during construction of the Preferred Alternative.

19.2.4.4 NOISE

Based on calculated A-weighted sound levels (dBA) as described in Chapter 12, "Noise and Vibration," Section 12.2.1.1.1, construction of the Preferred Alternative would result in predicted temporary adverse noise impacts, as defined in Section 12.2.2.2.1, at several receptors near the Project sites, as follows:

- Noise impacts from high volumes of construction vehicles, producing noise levels greater than 80 dBA, would occur at the following receptors throughout the course of new tunnel construction:
 - Residences on Tonnelle Avenue, between 10th Street and Secaucus Road in North Bergen, New Jersey. This would occur during four years of truck activities for Tonnelle Avenue portal and staging area and four years of North River Tunnel rehabilitation.
 - Residences on Willow Avenue south of West 19th Street, and on Park Avenue south of West 19th Street in Weehawken, New Jersey. This would occur during four years of truck activities for the Hoboken shaft site.
- Noise impacts would occur at the motel at 2600 Tonnelle Avenue in North Bergen, New Jersey, from continuous operation of tunnel ventilation fans, which would produce noise levels in the mid-70s to low 80s dBA throughout four years of North River Tunnel rehabilitation.
- Noise impacts would occur from continuous operation of tunnel ventilation fans, producing noise levels in the mid-70s to low 80s dBA, at residential receptors along Paterson Plank

² Occupational Safety and Health Administration Asbestos Standards for the General Industry and Asbestos Standards for the Construction Industry (<http://www.osha.gov/SLTC/asbestos/hazards.html>).

³ USEPA, (<https://archive.epa.gov/region9/toxic/web/html/basic.html>).

Road and along Grand Avenue between 19th Street and 23rd Street in North Bergen, New Jersey. This would occur throughout the approximately one year of tunnel mining and approximately 8 to 10 months of pile driving.

- Noise impacts resulting from pile-driving operations at the Twelfth Avenue shaft site and West 30th Street cut-and-cover excavation site in Manhattan, producing noise levels ranging from the high 70s to mid-90s dBA at nearby locations for approximately 12 months. This would occur at the new residential buildings planned at the east end of the block between West 29th and West 30th Streets and Eleventh and Twelfth Avenues, at the residential building on the east side of Eleventh Avenue between West 29th and West 30th Streets, and the portion of the High Line that runs along West 30th Street for a period of approximately 12 months.

The largest public health concerns related to noise are potential temporary adverse impacts predicted during overnight hours at sensitive locations, such as residences, from construction activities. Based on the duration and magnitude of the predicted noise exceedances, there would be temporary adverse noise impacts at these locations.

Where practicable, individual construction activities will be scheduled to avoid or minimize adverse noise impacts. The Project Sponsor will coordinate construction activities with New Jersey municipalities, New York City, and affected property owners. A noise and vibration complaint procedure will be established to promptly address community concerns and implement additional control methods when necessary.

Although the Federal Transit Administration construction noise impact thresholds are predicted to be exceeded over an extended period of time at the locations described above, the predicted absolute noise levels would not exceed the typical health-based noise threshold of 85 dBA consistently over an extended period of time (i.e., throughout an 8-hour period) for members of the public in the vicinity of these locations. For workers at construction sites associated with the Project, requirements established by the U.S. Occupational Safety and Health Administration (OSHA) would be followed to ensure protection of workers including hearing protection measures and protective equipment for workers exposed to noise levels above OSHA's 85 dBA threshold over a prolonged period of time.

The *CEQR Technical Manual* thresholds for adverse noise impacts would be exceeded over an extended period of time at the residential locations described above in New York, but because the buildings in question have or will have high levels of window/wall attenuation, interior noise levels would be below the typical health-based noise threshold of 85 dBA. In addition, the *CEQR Technical Manual* thresholds for adverse noise impacts would be exceeded over an extended period of time at a portion of the High Line in New York. However, because open space users do not typically spend an extended period of time in a single location on the High Line (i.e., an 8-hour period), they would not encounter long-term exposure to noise levels that exceed the typical health-based noise threshold of 85 dBA consistently for an extended period of time (i.e., an 8-hour period), which would have the potential to result in hearing damage.

Furthermore, qualified residences in New Jersey that would experience interior noise levels that exceed the level considered acceptable during overnight periods as a result of construction of the Preferred Alternative would be eligible for receptor controls, such as windows and air conditioners, to bring interior noise levels within the acceptable range. With the implementation of the noise control and mitigation measures described in Chapter 12, "Noise and Vibration," the construction activities associated with the Preferred Alternative would not result in noise-related public health impacts.

19.2.5 PERMANENT IMPACTS OF THE PREFERRED ALTERNATIVE

According to the *CEQR Technical Manual*, when no unmitigated adverse impact from a proposed project is predicted in other CEQR analysis areas—such as air quality, water quality, hazardous materials, or noise—no public health analysis is warranted.

As discussed in the relevant chapters of this EIS, the Preferred Alternative would not result in adverse impacts in any of those areas and therefore no further analysis of public health related to operation of the Project was conducted.

19.3 ELECTRIC AND MAGNETIC FIELDS (EMF)

Magnetic fields are one of the basic forces of nature. Any object having an electric charge has the potential to create an electric field. When electric charges move together (following an electric current), those charges create a magnetic field. The strength of a magnetic field depends on the magnitude of the current, the configuration and size of the source, spacing between conductors, and the distance from the source. Magnetic fields grow weaker as the distance from the source increases. Electromagnetic fields can be a concern because of the potential for damage to human health from exposure.

19.3.1 ANALYSIS METHODOLOGY

During development of this EIS, FRA and NJ TRANSIT developed methodologies for evaluating the potential effects of the Hudson Tunnel Project in coordination with the Project's Cooperating and Participating Agencies (i.e., agencies with a permitting or review role for the Project). The methodologies used for analysis of EMFs are summarized in this chapter.

19.3.1.1 REGULATORY CONTEXT

Federal health standards governing the appropriate levels of human exposure to EMF do not exist. However, the International Commission of Non-Ionizing Radiation Protection (ICNIRP), a non-governmental organization that is formally recognized by the World Health Organization, provides guidance on the EMF exposure limit for the general public. The ICNIRP recommends a chronic exposure limit to power-related frequency magnetic fields for the general public of 830 milligauss (mG)⁴.

19.3.1.2 ANALYSIS TECHNIQUES

Previous analyses conducted for the Access to the Region's Core (ARC) Project were reviewed to determine the potential for EMF from the Preferred Alternative and are incorporated by reference in this analysis. Since the Preferred Alternative would be in the same general area and would be constructed along nearly the same alignment as the ARC Project, the EMFs in the area, and their effects, would be similar and would not result in adverse impacts.

19.3.1.3 STUDY AREA

The study area for this analysis is the Project site, as defined in Chapter 4, "Analysis Framework" and the immediately adjacent areas.

⁴ ICNIRP *Guidelines for Limiting Exposure to Time-Varying Electric, Magnetic and Electromagnetic Fields*, 1998, www.icnirp.org/cms/upload/publications/ICNIRPemfgdl.pdf.

19.3.2 AFFECTED ENVIRONMENT: EXISTING AND FUTURE CONDITIONS

EMF near the NEC are generated by current in the catenary and rail structure. Additional fields may be generated by the electric locomotives that power trains and the electric multiple-unit trainsets that run on that line.

An assessment of the EMF levels along the NEC was undertaken as part of the ARC *Final Environmental Impact Statement (FEIS)* (August 2008). The ARC FEIS noted that existing measured EMF levels along the NEC⁵ are significantly below (as much as 200-300 times less than) the exposure levels sanctioned by ICNIRP; this standard has not changed since the ARC analysis was conducted in 2008. Since the Preferred Alternative would be in the same general area and would be constructed along nearly the same alignment as the ARC Project, the EMFs in the area, and their effects, would be similar, and conditions affecting EMFs, such as use of catenary electrical current used by the NEC system, has not changed since 2008. Therefore, adverse conditions relative to EMFs within the study area do not exist.

19.3.3 IMPACTS OF NO ACTION ALTERNATIVE

Under the No Action Alternative, there would be no notable change to EMF in the Project area.

19.3.4 CONSTRUCTION IMPACTS OF THE PREFERRED ALTERNATIVE

Tunnel boring machines (TBMs) used during construction of the Preferred Alternative would be electrically powered. Most of the other equipment that would be used during construction of the Preferred Alternative would be powered by gas or diesel engines, which do not generate EMFs. TBM activity would occur below ground; therefore, the tunneling activity would not expose any public populations (railroad passengers, residents, passers-by, or workers) to EMFs.

19.3.5 PERMANENT IMPACTS OF THE PREFERRED ALTERNATIVE

With the existing EMF measured to be well below the recommended maximum exposure level for health concerns⁶, the additional fields with the Preferred Alternative would still exhibit exposure below recommended levels. Therefore, adding new track, catenaries, and rail along or near the existing NEC would create no additional health hazard to populations nearest the NEC right-of-way (ranging from distances of 20 to 120 feet or more). Levels would also be considerably below the acceptable ICNIRP levels at further distances from the right-of-way. Therefore, the Preferred Alternative would not result in EMFs that would adversely affect public health.

19.4 MEASURES TO AVOID, MINIMIZE, AND MITIGATE IMPACTS

Construction and operation of the Preferred Alternative would not result in adverse impacts related to EMFs; therefore, no mitigation is proposed. *

⁵ *Montclair Extension: Post Construction Electric and Magnetic Measurements*, NJ TRANSIT, December 2002.

⁶ See footnote 2, above.