





# Environment

CONCERNS ABOUT THE ENVIRONMENT are central

to the work of the NJTPA. Despite being the most densely populated state in the nation, New Jersey has extensive undeveloped land, forests, farms, wildlife preserves and other natural resources that must be well managed and protected. The operation of the transportation system, construction of transportation projects and land use development tied to transportation can harm these natural resources. In addition, pollution from transportation affects the region’s air and water quality. ■ These and related concerns—including noise pollution and impacts on archeological sites and historic structures—have long been considered in the planning process to meet requirements in state and federal regulations. In recent years, climate change has become a more urgent concern based on mounting evidence of its potentially devastating impacts. ■ While transportation is often viewed in opposition to the natural environment, this



#### Readington, Hunterdon County

plan recognizes that well-planned transportation can be integrated into the environment with manageable impacts. Transportation, in some circumstances, can help foster public appreciation and support for environmental progress, for instance, by providing access to outdoor activities and recreation and fostering healthy lifestyles and sustainable living.

This chapter highlights some key environmental issues related to the NJTPA's planning work and steps it will take to support the environment. Additional information on the environmental mitigation work done by the NJTPA as part of the project delivery process can be found in Appendix I. Furthermore, the NJTPA developed a Resilience Improvement Plan, which identifies climate-related vulnerabilities and explores strategies to improve transportation resilience to climate hazards found in Appendix K.

#### Climate Change

Climate change presents a growing challenge to the effective functioning of the North Jersey transportation system and its ability to meet the increasing demands for the movement of people and goods. Along with broader disruptions to the economy, environment, quality of life and public health, these threats create an urgent need for the transportation sector to reduce greenhouse gas (GHG) emissions and for transpor-

tation infrastructure to be built or retrofitted in a more resilient way. A background paper for this plan (Appendix A) explored climate impacts facing the region and identified strategies NJTPA will pursue.

Climate change presents real and growing threats to the state's future. Sea levels are rising faster in New Jersey than in most of the Northeast in part due to land subsidence and other factors. In addition to preparing for potentially catastrophic events—such as Superstorm Sandy in 2012—the region must contend with more frequent flooding, more frequent and prolonged heat waves and more extreme storms.

Much of the region is vulnerable to rising sea levels, storm surge and flooding. According to a 2019 report by a Rutgers University Science and Technical Advisory panel, by 2050 New Jersey is expected to experience 0.9 feet to 2.1 feet of sea level rise (SLR) above the levels in 2000; by 2070 it is expected to experience 1.4 feet to 3.1 feet of SLR; and by 2100 it will experience 2 feet to 5.2 of SLR. And, as temperatures rise, New Jersey will experience a 4 to 11 percent increase in annual precipitation by 2050. Of great significance will be how the state experiences this precipitation. It will come as more frequent, intense and extreme rain events that lead to greater risk of floods. As base sea level rises, storm surge will become

a greater risk and is expected to increase in frequency and intensity and flood larger areas of land.

The aftermath of Superstorm Sandy and Hurricane Irene showed the devastation that water, wind, and falling debris can cause during severe weather events. Among the impacts are erosion that can undermine infrastructure foundations and accelerated deterioration of rail and roadway systems.

Strategies to address climate change must focus on adaptation, to make infrastructure more resilient, and mitigation, to reduce the amount of GHG from transportation. Nationwide, transportation was the largest source of GHG emissions in 2018 at 28 percent, followed by electricity generation (27 percent) and industry (22 percent). In New Jersey, transportation's contribution is much higher, accounting for 42 percent of total GHG emissions. According to the New Jersey Department of Environmental Protection (NJDEP), 68 percent of the transportation sector's GHG emissions are generated by passenger cars, passenger trucks or motorcycles.

Strategies to mitigate these emissions involve reducing vehicle miles traveled, by encouraging transit ridership or more compact and walkable land uses; or switching the energy source, such as vehicle electrification coupled with low-carbon electricity generation and distribution. Adaptation strategies to make infrastructure more resilient include elevating roadways and transit electrical systems, relocating facilities from flood-prone areas, and investing in alternative or redundant routes or systems. Mitigation and adaptation must work in tandem as part of effective climate change responses.

### **Implementation**

The NJTPA has been active in addressing climate change for a decade or more. The NJTPA is guided by federal planning factors written into law, including the need to “Improve the resiliency and reliability of the transportation system.” This is reflected in NJTPA's own planning goal to “protect and improve natural ecosystems” and in the application of project prioritization criteria that award points to projects that “promote adaptation and resiliency to extreme weather events and the impacts of climate change.”

Moreover, the agency's responsibilities under federal law to reduce air pollution from the

transportation sector, as discussed later in this chapter, support the use of low carbon fuels and means of travel, also helping to reduce GHGs. These responsibilities have provided the agency the tools and expertise to continue to support New Jersey's climate change policies and initiatives, captured in the NJDEP's October 2020 Global Warming Response Act 80x50 Report. It assesses New Jersey's GHG reduction progress by emissions sector and provides recommendations for achieving an 80 percent reduction from 2006 levels by 2050. Further implementation guidance is provided by the May 2021 Draft Climate Change Resilience Strategy which includes recommendations for actions the State should take to mitigate and adapt to the effects of climate change. The NJTPA also supports climate change initiatives from Congress and federal agencies.

The Plan 2050 *Climate Change and Transportation* background paper identified key steps the NJTPA will take to combat climate change through its plans, programs, and coordination functions, including:

- Supporting electrification of vehicles and the creation of vehicle charging systems.
- Supporting partner agencies and subregions in efforts to review and revise operations to reflect both current and projected climate impacts.

**Cranford, Union County**



JOSUE LORA / NJ GOVERNOR'S OFFICE



## WHAT WE HEARD

*“Mass transit is important for a cleaner environment. The state should support NJ TRANSIT and help encourage residents to use mass transit options.”*

—MIDDLESEX COUNTY RESIDENT, ONLINE SURVEY

*“I’m an electric car driver so I’m all for pushing the electric vehicle movement forward in any way possible. I think it’s the future.”*

—WARREN COUNTY RESIDENT, ONLINE SURVEY

*“Climate change is very, very REAL, unless we get out of our cars, and develop healthier behaviors; we unfortunately are already seeing irreversible changes to our Earth and society.”*

—MONMOUTH COUNTY RESIDENT, ONLINE SURVEY

- Supporting low-carbon transit and walking/biking options, TOD and TDM.
- Overseeing and modeling the impacts planned transportation investments have on air quality.
- Supporting projects that target reducing pollutants whose emissions are tied to generation of GHGs.
- Funding studies to address the vulnerability of transportation infrastructure to climate change, such as the 2019 Passaic River Basin Climate Resilience Planning Study.
- Providing grants under the federal Congestion Mitigation and Air Quality (CMAQ) program. Funds have been used for electric vehicle

### Woodbridge, Middlesex County



infrastructure, diesel retrofits for vehicles and equipment, idle reduction technology, traffic signal optimization, ITS and local shuttle services and more.

These and other activities represent NJTPA’s commitment to working with its partner agencies and the counties, cities, and municipalities in the region to combat climate change and achieve sustainable transportation and a more sustainable environment.

### Air Quality

Transportation is a major source of air pollution, which can exacerbate asthma and other serious health conditions. Many factors affect the level of pollution, including the number of car and truck trips, trip length, time spent idling in congestion, vehicle technology and more.

The NJTPA is responsible for advancing transportation policies and projects that will help improve air quality in its region. The Figure 6-1 illustrates the current status of emissions in the NJTPA region. Ozone continues to be the greatest challenge. The NJTPA region is currently in “nonattainment” (does not meet the National Ambient Air Quality Standards) for ozone (O<sub>3</sub>). However, the NJTPA region has made great strides in improving air quality by significantly reducing emissions from fine particulate matter (PM 2.5) and carbon monoxide (CO). In fact, the NJTPA region is currently completing its first ten year “maintenance” phase for PM 2.5 (requiring it to continue to meet standards for 20 years) and is in “attainment” for CO having met National Ambient

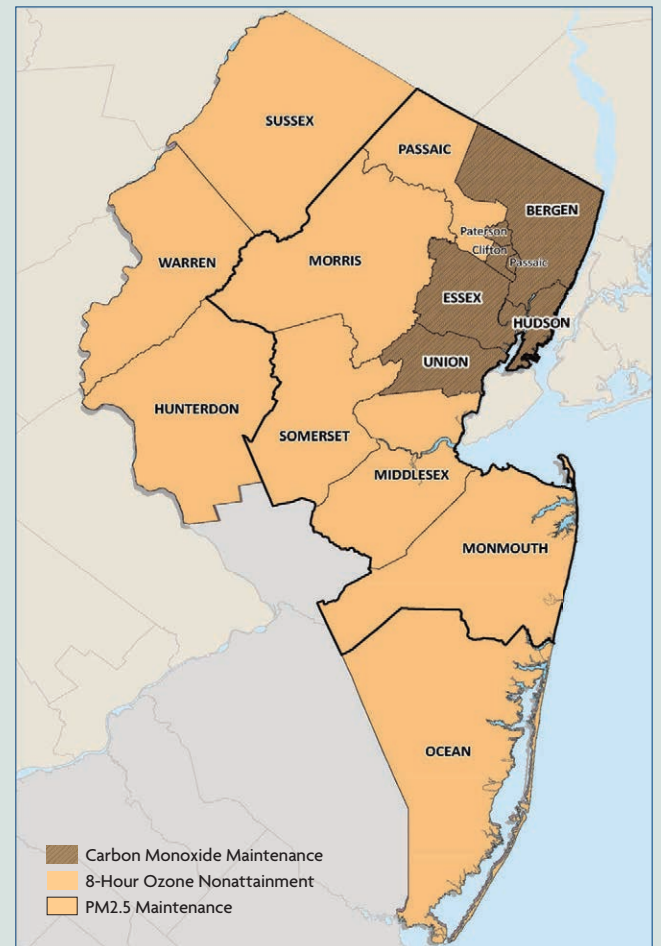
Air Quality Standards for 20 years).

To address air quality non-attainment and maintenance, the NJTPA is required to demonstrate conformity with state air quality commitments. That is, the NJTPA must use modeling to show that the projects it approves through the TIP and this long range plan will have a net zero or positive impact on air quality and contribute to the achievement of the air quality goals contained in the New Jersey State Implementation Plan (SIP). NJDEP establishes the SIP with pollutant budgets for mobile sources. The Air Quality Conformity determination for Plan 2050 can be found in Appendix H. As indicated in Chapter 3, there has been an overall reduction in bad air quality days from 53 in 2010 to 10 in 2019.

Reining in pollutants from transportation is an important component of realizing environmental justice. Low income and minority communities face disproportionate impacts because many live in urban areas or along major highways where there are higher concentrations of mobile source emissions. These emissions come from several vehicle-related processes, including tailpipe exhaust, fuel evaporation, brake and tire wear, and dust kicked up from traffic and from industrial facilities.

Those emissions cause health problems including higher rates of asthma and cardiopulmonary disease. Children, older adults and people with preexisting cardiopulmonary disease are at especially higher risk.

Figure 6-1: Maintenance and Nonattainment Areas in the NJTPA Region



## WHAT WE HEARD

*“We need to look at the demographics of who is at most health risk from transportation activity; whose physical safety is at greatest risk in terms of traffic safety; how lack of access to opportunity creates stress and health risk inequitably; who is benefitting from the investments that are made and the way the system is managed; and finally, how system funding and management contribute to any inequities that we find in these regards.”*

—NEWARK COMMUTER, ONLINE SURVEY

*“I would like to see buses and trucks that do not pollute, especially in urban areas (e.g., Port areas, Newark, Elizabeth, Camden, Trenton). Poorer people cannot easily move to areas of low pollution, so we should reduce pollution in these areas. This will improve their quality of life and reduce their personal (and government-supported) healthcare costs, too.”*

—SOMERSET COUNTY RESIDENT, ONLINE SURVEY

Minority communities across the state have a higher prevalence of asthma.

While trucks and cars are becoming cleaner because of alternative fuels, the NJTPA will continue to address these impacts as part of its commitment to regional equity, including through the consideration of environmental justice factors in the selection of projects for funding. One example of this is the inclusion of an equity factor in the selection of Transportation Alternative Program (TAP) projects, in conjunction with the NJDOT and neighboring MPOs.

In addition to overseeing air quality impacts and conformity, the NJTPA supports continued air quality progress through its funding programs. The NJTPA's Transportation Clean Air Measures (TCAM) program has funded adaptive traffic signal systems and less-polluting off-road diesel construction equipment, ferry engines and electric vehicles and infrastructure. The Local Mobility Initiatives program supports shuttle buses around the region. The programs are funded with federal CMAQ allocations to the region.

As part of required performance measurement, the NJDOT, with the support of the NJTPA, tracks the impacts of projects funded by CMAQ, and sets specific

targets that aim to reduce emissions for pollutants of concern (Table 6-1). The 2018 targets were met at both the state and MPO levels.

### Implementation

In 2005, as part of efforts to reduce harmful emissions, the NJTPA launched its TCAM program. Federal CMAQ funds are awarded on a competitive basis to implement projects that reduce emissions and congestion across North Jersey. In 2020 the NJTPA awarded \$21.0M for a range of projects including electric vehicles and infrastructure, traffic signal optimization, diesel retrofits, truck replacements and bicycle/pedestrian projects. This program will be continued and enhanced as part of NJTPA's regional air quality efforts

The NJTPA also administers the Local Mobility Initiatives program with CMAQ funds in partnership with NJ TRANSIT. This program funds the development of financially sustainable and innovative shuttle services that provide increased opportunities for travelers to connect to major transit routes, and last mile connections to major destinations. This program also funds replacement vehicles for existing or expanded

**Table 6-1: CMAQ Emission Reduction Measures—NJTPA AQ Areas<sup>1</sup>—2- and 4-year targets<sup>2</sup>**

MEASURE	POLLUTANT	AQ AREA	FEDERAL FISCAL YEARS				
			FY2014-2017	FY2018-2019		FY2018-2021	
			PREVIOUS CONDITION	2-YEAR TARGET	2-YEAR CONDITION	2-YEAR TARGET MET?	4-YEAR TARGET
Total (cumulative) criteria pollutant reduction (kg/day) from CMAQ Projects in AQ Areas <sup>1</sup>	CO	New Jersey/NJTPA CO Areas <sup>1</sup> (identical)	67.376	31.927	145.495	✓	63.010
	PM <sub>2.5</sub>	New Jersey PM <sub>2.5</sub> Areas <sup>1</sup>	9.572	4.290	156.936	✓	8.520
		NJTPA PM <sub>2.5</sub> Areas <sup>1</sup>	4.312	1.663	48.382	✓	3.267
	VOC	New Jersey Ozone Areas <sup>1</sup>	44.493	17.682	157.750	✓	36.324
		NJTPA Ozone Areas <sup>1</sup>	31.937	14.026	79.241	✓	27.318
	NO <sub>x</sub>	New Jersey Ozone Areas <sup>1</sup>	244.301	114.401	1500.520	✓	231.850
		NJTPA Ozone Areas <sup>1</sup>	206.771	101.722	752.218	✓	202.745

Notes:

<sup>1</sup> "AQ Areas" are nonattainment or maintenance areas for ozone, carbon monoxide or particulate matter. Note that for the emissions reduction measures, the NJTPA is required to set targets specific to the AQ Areas within its planning region. Where different, the statewide targets are also shown for reference.

<sup>2</sup> NJTPA regional targets were met mainly due to its share of statewide projects and programs. Given ongoing uncertainty due to COVID-19 and Buy America, the 4-year targets have not been changed even though they have already been met.





shuttle services. In 2020 the NJTPA awarded \$1.9M for four shuttle projects. This program will also be part of NJTPA continuing regional air quality efforts.

These and other air quality activities with be adapted to respond to any new mandates or regulations combatting climate change. Overall, implementing improved air quality in the region will include:

- Meeting the requirements of the Federal Clean Air Act
- Upgrading regional air quality modeling capabilities
- Solicitating proposals under the CMAQ-funded TCAM and Local Mobility Initiatives programs
- Including air quality benefits in project selection criteria
- Coordinating with NJDEP, NJDOT, NJ TRANSIT and the Port Authority, the NJTPA subregions and the TMAs on CMAQ-funded initiatives.
- Supporting travel alternatives and options, as discussed elsewhere in this plan, that lower emissions, including promoting transit use, walking/biking, TDM and other measures.
- Supporting technologies, including vehicle electrification, connected vehicles, traffic operations management, clean energy, and adaptive signals, to realize greater system efficiency and lower emissions.

#### Hillsborough, Somerset County

### Environmental Mitigation

The NJTPA's planning and project development programs are designed to consider the impacts transportation projects can have on both the human and natural environments. Multi-disciplinary teams from the subregions, NJTPA and NJDOT work together on project development with the goal of avoiding impacts and minimizing and/or mitigating impacts that do occur. Project delivery processes can be streamlined through early coordination with environmental agencies during the planning phase.

The NJTPA's environmental protection and mitigation activities are guided by key federal and state requirements including:

- National Environmental Policy Act (NEPA)—A federal law that requires agencies to conduct environmental reviews and consider the potential impacts of projects on the natural and social environments.
- FAST Act—Regulations implementing this federal surface transportation law encourage a program for Planning and Environmental Linkages, which incorporate environmental and community values into transportation decisions early in planning and





**Mantoloking, Ocean County**

carrying these considerations through project development and delivery.

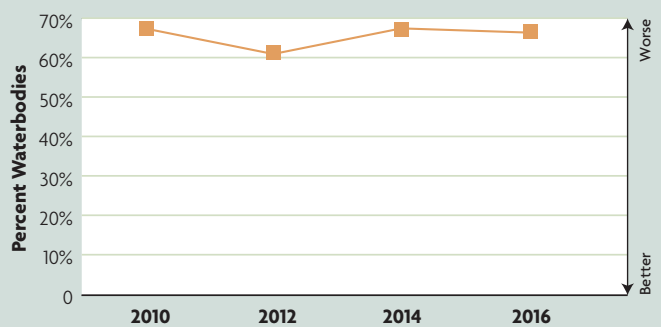
- Environmental Justice—As part of NEPA evaluations, transportation agencies identify and address any disproportionately high and adverse human health or environmental effects of federal programs, policies, and activities on minority and low-income populations.
- Land Use Management Regulations—These rules, administered by NJDEP, strive to balance responsible land development and protection of New Jersey’s valuable natural resources.
- Historic Preservation Regulations—These rules, administered by the Historic Preservation Office of NJDEP, focus on identifying, preserving, protecting, and sustaining historic and archaeological resources.

These and other requirements guide project development work beginning at the concept development phase. During this phase, the NJTPA seeks to ensure early coordination with review agencies, and collaboration with local governments and communities, to identify and compare reasonable alternatives and the selection of a preliminary preferred alternative.

This early consideration of environmental concerns can avoid confronting impacts when plans are already in place and difficult to alter and help streamline project delivery. It exemplifies NJTPA’s goals to balance and integrate efforts to both safeguard the environment and enhance regional mobility as discussed in this plan.

NJTPA’s mitigation of project impacts are part of ongoing environmental planning activities beyond the project development process. In addition to climate change and air quality planning discussed earlier in

**Figure 6-2:**  
Biennial Percent Waterbodies of Watersheds Not Supporting Aquatic Life in the NJTPA Region



Source: NJTPA Regional Performance Measures Dashboard

this chapter, among the key environmental considerations in NJTPA planning are water and other natural features, and cultural and historical resources. These are discussed below.

### WATER QUALITY

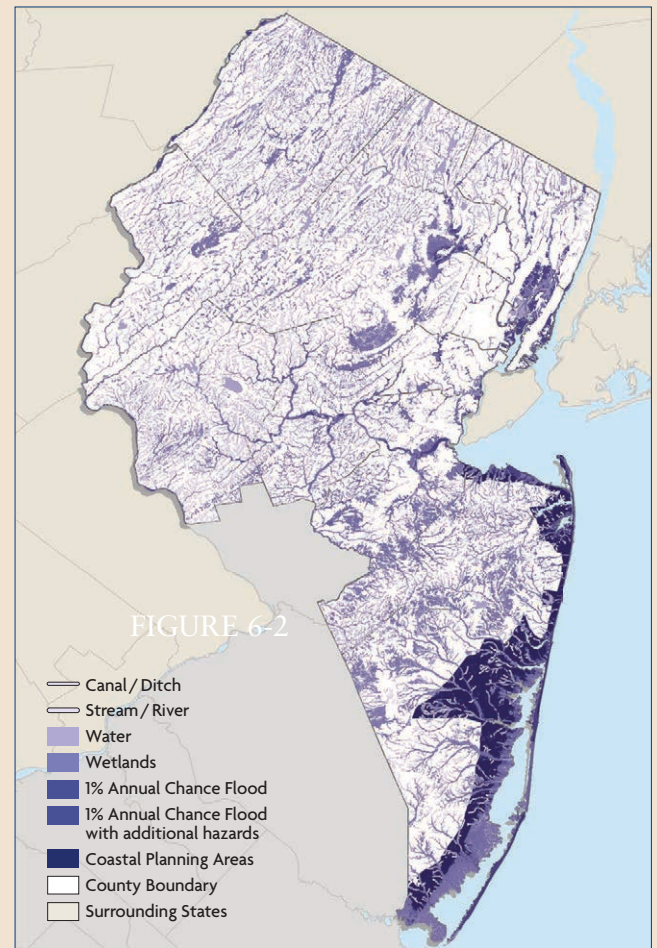
As the region continues to grow, protecting the sources of our drinking water becomes increasingly important. This is a key goal of special districts created through the Highlands Water Protection and Planning Act and the Pinelands National Reserve. The Highlands encompasses over 850,000 acres in the northwest portion of the NJTPA region. The Pinelands, partially located in Ocean County, sits on one of the largest and cleanest sources of drinking water in the country, the Kirkwood-Cohansey Aquifer. Both special districts help define areas where growth can be supported while preserving more sensitive lands.

Throughout the region, stormwater runoff from paved surfaces and transportation facilities can pollute waterways and threaten aquatic life (Figure 6-2). Environmental regulations governing transportation projects at the state and federal levels require NJTPA and its partner agencies to assess and mitigate non-point source pollution from transportation projects including water runoff.

“Green infrastructure” measures to improve water quality are also increasingly being integrated in street designs, including complete street and resiliency initiatives, to slow and better manage stormwater runoff that can overwhelm sewer systems and contaminate waterways and drinking water. Measures include installation of curbside planters or bioswales, permeable pavements, vegetated strips, and rain catchment systems. The Lakeview Corridor in Paterson in Passaic County and the City of Hoboken in Hudson County are among the communities that are planning and implementing these measures. The NJTPA encourages their planning and use.

In addition, the NJTPA considers the likelihood of flooding impacts on local projects, primarily bridge projects, in Local Concept Development (see Appendix I). Environmental screening maps produced for each project show the 100-yr flood plain for the project study area. These maps are then used for preliminary analysis to show the likely impacts of flooding on each alternative for the project. Further detailed

Figure 6-3: Water Resources



Source: NJDEP 2008, 2010, 2012; FEMA, 2018; NJOGIS, 2008; U.S. Geological Survey, 2020; Esri, 2021.

analysis of floodplain Impacts on the Preliminary Preferred Alternative for each project takes place in the Preliminary Engineering (PE) phase of project development.

### OPEN SPACE & WILDLIFE HABITATS

Despite the state’s dense population, New Jersey has among the nation’s most successful programs for preserving open space and natural resources. According to NJDEP, the state’s Green Acres program, created in 1961, “has protected over half a million acres of open space and provided hundreds of outdoor recreational facilities in communities around the State.” State efforts support and are coordinated with programs of counties and municipalities, many of which make yearly allocations to open space preservation, and the work of numerous non-profit and private sector





**Milltown, Middlesex County**

organizations. New Jersey voters have consistently shown support for referendums providing funding for open space initiatives. These efforts are supplemented by state programs to support farmland preservation and to relocate homes from flood prone areas.

Transportation improvements sometimes can present threats to open space preservation by opening up areas for new development. Of recent concern, as noted in Chapter 3, is the development of fulfillment and warehouse facilities on open greenfield sites and farmlands prompted by the growth of e-commerce. The NJTPA, through its project prioritization criteria, favors projects that provide access to areas already designated for development with infrastructure already in place to support it, particularly formerly contaminated buildings or sites, also known as brownfields. NJTPA planning programs support studies and projects making sustainable use of available land.

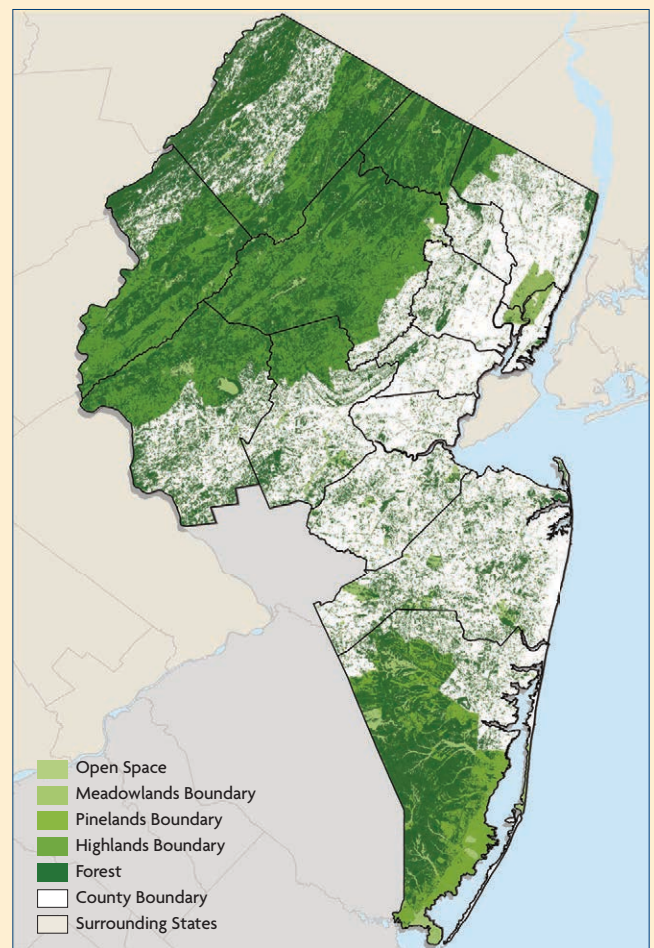
Preserving and enhancing wildlife habitat must be part of sustainable transportation. Transportation facilities can reduce and fragment forests, wetlands and other spaces that are critical habitat for the state's wildlife, including threatened/endangered species. In addition, transportation facilities can present barriers to wildlife movement and migration, isolating animals from food and resources or forcing them into dangerous road crossings. Mitigation can include tunnels, green bridges and fencing to channel animals to these crossings. Transportation project development must investigate habitat concerns as part of the early stages

of project planning where strategies are most easily incorporated. Transportation planning must draw upon and coordinate with state efforts including using tools such as the Connecting Habitat Across New Jersey (CHANJ) mapping application offered by the NJ Division of Fish and Wildlife.

**CULTURAL AND HISTORIC RESOURCES**

Environmental mitigation extends to preserving cultural and historical resources. North Jersey has been home to indigenous peoples for thousands of years, as well as people from around the world for hundreds of years. All these human settlements have left behind historic cultural resources and artifacts, ranging from ancient sacred sites and industrial revolution artifacts. The region was the site of important routes and stops on the Underground Railroad, particularly in Jersey

**Figure 6-4: Open Space**



Source: NJDEP 2008, 2021; NJ Highlands Council, 2019; NJOGIS, 2017; Pinelands Commission.

City in Hudson County and Warren County and home to numerous historic colonial settlements, leaving a rich and diverse multicultural legacy.

### Future Environmental Planning

Environmental issues are part of nearly all planning work conducted by the NJTPA and will become an increasing focus in years to come. As discussed in this chapter, the NJTPA has direct involvement with implementing measures to address climate change, improve regional air quality and mitigate project-related environmental impacts. But concerns about the environment and strategies to protect open space, water quality, cultural resources, and other natural features of the region are also part of ongoing transportation planning studies and initiatives by the NJTPA, its subregions and partner agencies. Criteria used for NJTPA grants and



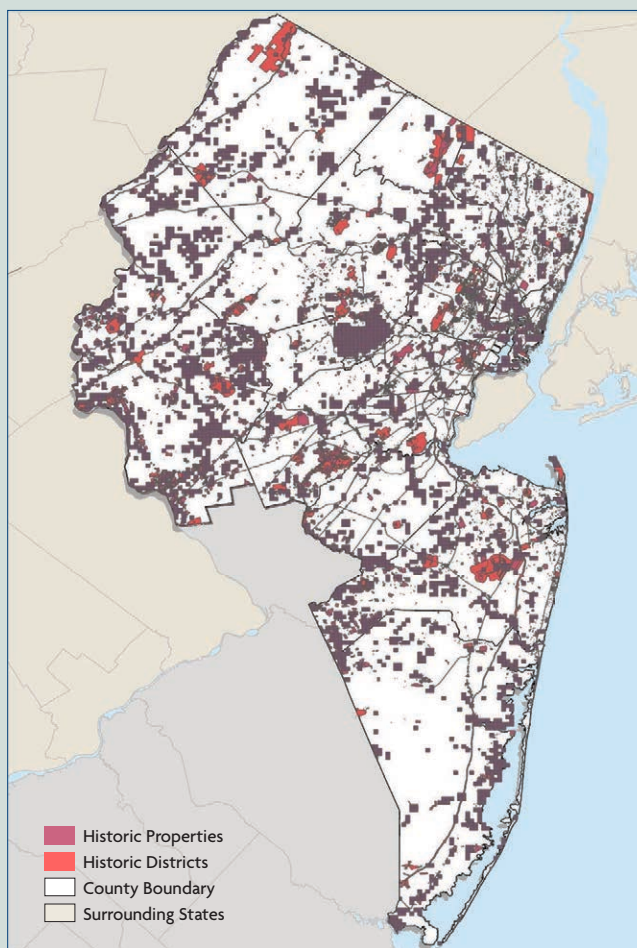
Jersey City, Hudson County

technical assistance reflect the need to consider a wider range of environmental factors in transportation plans and investments.

NJTPA has also joined with a broader array of agencies and organizations in Together North Jersey (TNJ), as discussed in Chapter 1, to support an update to the 2015 TNJ Regional Plan, which addresses environmental, transportation, and other issues beyond the scope of the MPO. It helps guide and shape land use and development policies in communities in ways that balance economic and environmental concerns for the long-term.

These and other planning activities of the NJTPA provide the foundation for effective responses to future environmental challenges, particularly from climate change impacts. These responses must recognize and better address regional environmental justice, helping undo and guard against disproportionate impacts of pollution and other environmental impacts on the health and well-being of minority and low-income communities. The responses may also involve helping the region cope with future potentially catastrophic events—as occurred with Superstorm Sandy and the pandemic. The NJTPA is committed to working with its member and partner agencies and the public to ensure that protecting and improving the environment continues to be a priority of regional planning and investment.

Figure 6-5: Historic Resources



Source: NJDEP, 2021; NJOIT, 2008; NJTPA, 2021.